ELECTRICITY REGULATORY AUTHORITY

# ELECTRICITY REGULATORY AUTHORITY DETERMINATION OF TARIFF ADJUSTMENT FACTORS FOR THE FOURTH QUARTER OF 2017

OCTOBER 2017
KAMPALA, UGANDA

## 1. INTRODUCTION

### 1.1 Background

At the beginning of each quarter, the Electricity Regulatory Authority ("the Authority") undertakes a Quarterly Tariff Review. The Quarterly Tariff Review is undertaken in accordance with the respective Licenses issued by the Authority (to Umeme Limited, Uganda Electricity Transmission Company Limited (UETCL), and Eskom Uganda Limited), and in accordance with the Quarterly Tariff Review Methodology approved and published in the Uganda Gazette in January 2014. The Quarterly Tariff Review Methodology provides for adjustment of the Electricity annual Base Tariffs for changes in the following:-

(i) Inflation rate leading to Inflationary Adjustment Factor (IRAF)
(ii) Exchange rate leading to Exchange Rate Adjustment Factor (FERAF);
(iii) Fuel prices at the International Market leading to Fuel Price Adjustment Factor (FPAF);
(iv) Changes in the Energy Generation Mix; and
(v) Any cost as may be approved by the Authority.

This review has taken into account changes in; the Consumer Price Index to reflect movement in the Inflation Rate, Exchange Rate of the Uganda Shilling (Ush) against the United States Dollar (US$), International Fuel Prices, and the Energy Generation Mix; from the assumptions used in the determination of the 2017 Base Tariffs. The review has further considered the adjustment of the 2017 annual budget for Uganda Electricity Generation Company Limited (UEGCL), and changes in the approved and verified investments for Umeme Limited and Eskom Uganda Limited. More specifically;

(i) The Uganda Shilling has appreciated by 0.82% against the US Dollar, from Ush 3,630.22/US$ in November 2016 to Ush 3,600.38 /US$ as at 31st August 2017. The movement in August 2017 was a slight appreciation from the Ush 3,602.63 /US$ reported as at 31st

May 2017 and used in determination of Tariffs for the third quarter of 2017.

(ii) The International Price for Heavy Fuel Oil as at the end of September 2017 was US$49.6 per barrel compared to US$ 49.2 per barrel registered in June 2017 although still below US$ 51.90 per barrel used in the determination of the 2017 Base Tariffs. This represents a reduction in International Fuel Prices by 4.64% from the 2017 base period and 0.81% increase from the third quarter 2017.

(iii) The total quarterly energy purchased by UETCL is expected to increase from 942.9 GWh used in the determination of the 2017 Base Tariffs to 991.27 GWh in the fourth quarter of 2017. This represents an increase of 5.1% in energy purchases by UETCL from the assumptions used in the Base Tariffs and 4.29% from the third quarter of 2017 (950.49 GWh).

(iv) The water release at the Nalubaale-Kiira generation complex is projected at 1,000 Cubic meters per second (cumecs) for the fourth quarter of 2017, translating into an average generation capacity of 185 MW from Nalubaale-Kiira and 197 MW from Bujagali Energy Limited.

(v) Adjustment of the approved and verified investments by Umeme Limited for the period 2012 – 2015 following disposal of the Investment appeal by the Authority. Additional gross investments of US$ 11,009,051 have been maintained in the fourth quarter of 2017.

(vi) Adjustment for Ush 22,945,530,343 on account of un-recovered investment-related costs following the disposal of the investment appeal by the Authority. The recovery of Ush 22,945,530,343 has been provided for in the determination of the Distribution Price for the fourth quarter of 2017.

(vii) Adjustment of the Uganda Electricity Generation Company Limited (UEGCL) budget to cater for additional approval in respect to Mortgage charges amounting to Ush 634,536,000 as approved by the Authority.

The detailed assumptions that form the basis of the Tariff Review for the fourth quarter of 2017 are contained in the subsequent sections of this report.

### 1.2 Review Process and consultations

As part of the Tariff Review process for the fourth quarter of 2017, consultations have been undertaken with stakeholders including; the Ministry of Energy and Mineral Development, Uganda Manufacturers Association, Licensees (Umeme Limited, Uganda Electricity Transmission Company Limited, and Eskom Uganda Limited), and the media.

During the consultations, the drivers underlying the Tariff determination for the fourth quarter of 2017, and how the drivers have changed since determination of the Base Tariffs for 2017 were discussed.

### 1.3 Purpose of this Report

The purpose of this report is to present the results of the Tariff Review for the fourth quarter of 2017, and to set out the determinations, and the reasons informing the resultant Tariffs for the Authority's consideration and approval.

### 1.4 Structure of the Report

This report is divided into six (5) sections. The first section of the report has the introduction. The rest of the report is structured as follows; section two (2) reports on the 2017 base parameters, section three (3) explains the adjustment factors, section four (4) presents the movement in the revenue requirement, and section five (5) presents the resultant Tariffs.

## 2. 2017 BASE ELECTRICITY END-USER TARIFFS

In accordance with the Quarterly Tariff Review Methodology, the Authority at its 270th meeting held on 20th December 2016 approved the 2017 Base Tariffs shown in Table 1.

The quarterly adjustment factors are applied to the approved Base Tariffs, to determine the applicable End-User (Retail) Tariffs for the respective quarters during the Tariff Year.

**Table 1: 2017 Base Electricity End-User Tariffs**

| | End-User (Retail) Electricity Tariffs (Ush/kWh) | | | | | | |
|---|---|---|---|---|---|---|---|
| | **Domestic** | **Commercial** | **Medium Industrial** | **Large Industrial** | **Extra Large** | **Street-lights** | **Weighted average** |
| 2017 Approved Base Tariffs | 696.9 | 629.0 | 577.8 | 376.3 | 372.8 | 679.7 | 513.2 |

During the determination of the Base Tariffs, the Authority approved the Base Macroeconomic Parameters for 2017, which are presented in the third column of Table 2.

**Table 2: Macroeconomic Parameters Used in Determination of 2017 Base Tariffs and the Adjustment Parameters for Q4 2017**

| | Macroeconomic parameters for each Tariff period in 2017 | | | | | |
|---|---|---|---|---|---|---|
| S/N | Description | Q1 (Jan – March ) – Annual Base | Q2 April – June | Q3 July - September | Q4 October - December | %age Change Base to Q4 2017 |
| 1 | Exchange rate USh/US$[1] | 3,630.2 | 3,586.7 | 3,602.6 | 3,600.4 | (0.8%) |
| 2 | Core Consumer Price Index (CPI)[2] | 159.4 | 161.7 | 163.3 | 163.4 | 2.5% |
| 3 | US Producer Price Index[3] | 196.4 | 197.8 | 198.3 | 198.5 | 1.1% |
| 4 | International Price of Fuel[4] (US$ per barrel) | 51.90 | 53.37 | 49.2 | 49.6 | (4.4%) |

The base macroeconomic factors (for the month of November 2016) which formed the basis for the 2017 Base Tariffs determination are stated in column 3 of Table 2. As of August 2017, these parameters had changed as shown in column 6 of Table 2. The detailed analysis of each of the macroeconomic factors is contained in the subsequent sections.

[1]Bank of Uganda for exchange rate - The exchange rate is the average rate of the buying and selling rates on the last day of the applicable month. That is November 2016 for Q1 2017, May 2017 for the third quarter of 2017, and August 2017 for the fourth quarter of 2017.

[2] Uganda Bureau of Statistics for Consumer Price Index
[3] US Bureau of Labour Statistics for US Producer Price Index
[4] Organization of Petroleum Exporting Countries for International Fuel Prices

## 3. DETERMINATION OF THE ADJUSTMENT FACTORS FOR THE FOURTH QUARTER OF 2017

### 3.1. Foreign Exchange Rate Adjustment Factor (FERAF)

The movement in the Exchange Rate of the Uganda Shilling against the United States Dollar directly affects the costs (Uganda Shilling Revenue Requirement) for companies operating in the Electricity Supply Industry. The Tariffs are adjusted for movement in the Exchange Rate because a substantial portion of the Electricity Supply Industry costs are incurred in foreign currency yet the Retail Tariffs are charged and revenues collected in Uganda Shillings.

Since the second quarter of 2017, there has been a decrease (compared to the base) in the Uganda Shilling equivalent of the cost incurred in foreign currency on account of the appreciation of the Uganda Shilling against the United States Dollar.

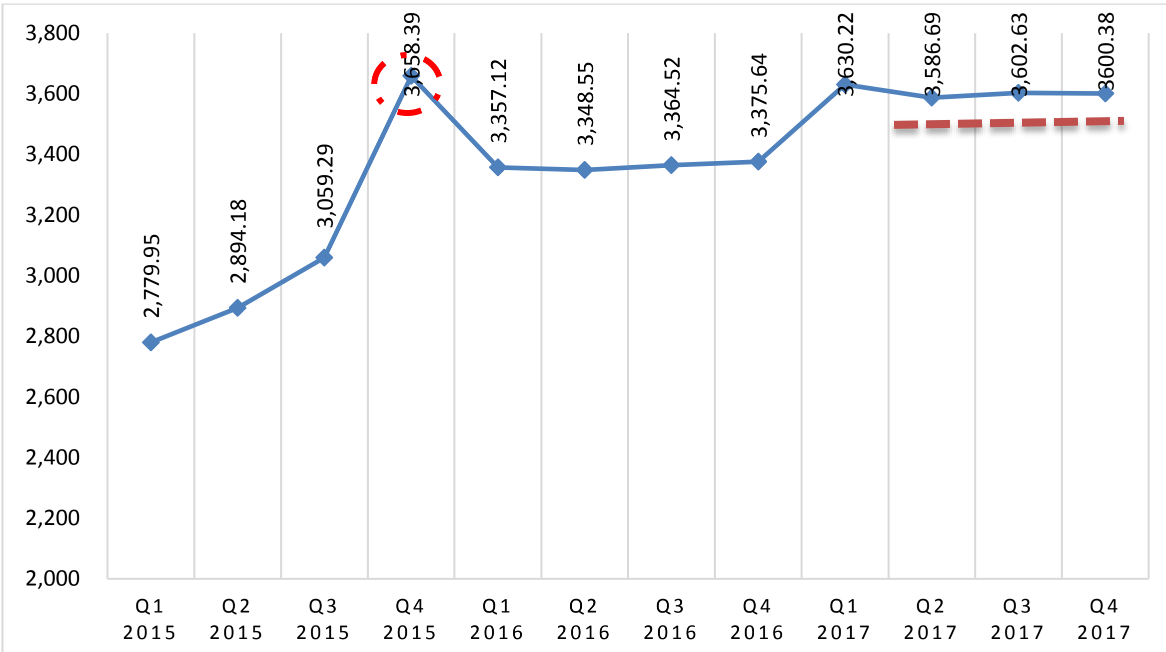
During the determination of the 2017 Base Retail Tariffs, the Authority approved the foreign currency content of the Operation and Maintenance (O&M) Costs of 38.71% for Eskom Uganda Limited, 28.0% for UETCL, and 33.0% for Umeme Limited. Over 99% of UETCL's power purchase costs are incurred in foreign currency as Power Purchase Agreements are either executed in United States Dollars or are pegged on the United States Dollar (except the Power Purchase Agreement for Tibet Hima Mining Company Limited which is in Uganda Shillings).

In addition, the Investment-Related costs for Umeme Limited including capital recovery, and return on Investment are recovered in United States Dollars. Therefore, the appreciation of the Uganda Shilling against the United States Dollar reduces the shilling equivalent of the electricity industry costs required in foreign currency.

Between the fourth quarter of 2016 and the third quarter of 2017, the Uganda Shilling has remained relatively stable compared to the period June 2015 to November 2015. The Exchange Rate used in determination of the fourth quarter of 2017 Tariffs is Ush 3,600.38 per

US$ compared to Ush 3,630.22[5] at the end of November 2016, which was used in the determination of the 2017 Base Tariffs. This represents an appreciation of 0.82%. The trend of the Exchange Rate of the Uganda Shilling against the United States Dollar is shown in Figure 1.

**Figure 1: Ush/US$ Exchange Rate movement to August 2017**




Like many other emerging and frontier markets, the fall in export commodity prices and low demand in key export markets weakened many currencies against the United States Dollar. The increase of the interest rates in March 2017 by the Federal Reserve still poses a risk to the stability of Uganda's Exchange rate in the medium term over the next six months. However, the Uganda Shilling outlook remains stable supported by inflows from commodities and Non-Governmental Organizations.

The appreciation of the Uganda Shilling has a substantial impact on Electricity Supply Industry costs and consequently the End-User Tariffs. The Authority's review indicates that the appreciation of the Uganda Shilling in the third quarter of 2017 (compared to the base) decreased

[5] https://www.bou.or.ug/bou/rates_statistics/statistics.html

the sector annualized revenue requirement by Ush 11,454 Million and subsequently decreased the End-User Tariffs by a weighted average of **Ush 3.1/kWh** as shown in Table 3.

**Table 3: Foreign Exchange Rate Adjustment Factor (FERAF)**

| | End-User (Retail) Electricity Tariffs (Ush/kWh) | | | | | | |
|---|---|---|---|---|---|---|---|
| | **Domestic** | **Commercial** | **Medium Industrial** | **Large Industrial** | **Extra Large** | **Street-lights** | **Weighted average** |
| Exchange Rate Adjustment Factor (FERFAF) | (2.2) | (2.2) | (1.9) | (4.3) | (4.2) | (1.8) | (3.1) |

## 3.2. Inflation Rate Adjustment Factor (IRAF)

The annual Consumer Price Index (CPI) for the month ending August 2017 was 163.4 compared to 159.4 in November 2016. According to Bank of Uganda, the core inflation reduced to 4.1% in August 2017 down from 5.1% recorded in May 2017 while headline inflation reduced from 7.2% in May 2017 to 5.2% recorded in August 2017. The reduction in inflation is mainly attributed to the improvement in food crop yields due to improved weather conditions. The relative stability of the Exchange rate and subdued domestic demand have contributed to the dampening of core inflationary pressures over the last twelve months.

### 3.2.1. Effect of Inflation on the Tariffs

The inflation adjustment is applied only to the local currency component of the Operation and Maintenance costs for Eskom Uganda Limited, UETCL, and Umeme Limited. This is based on the local currency content approved by the Authority at the time of determination of the 2017 Base Tariffs (i.e. 61.29% for Eskom Uganda Limited, 72.0% for UETCL and 67.0% for Umeme Limited).

The Inflationary Adjustment Factor is based on the composite Consumer Price Index (CPI) for the second month in the preceding quarter to which the adjustment Tariff relates as published by the Uganda Bureau of Statistics. For the fourth quarter of 2017, the applicable CPI is 163.4 (August 2017) representing an increase of 2.5% compared to the CPI of November 2016, of 159.4.

The United States (US) Producer Price Index (PPI) is used to adjust the Operation and Maintenance costs denominated in United States Dollars (US$) to cater for changes in prices of imported supplies. In the period under review, the US PPI increased from 196.4 in November 2016 (Base US PPI) to 198.5 in August 2017, representing an increase of 1.07%.

The movement in the Consumer Price Index and the United States Producer Price Index increased the sector annualized revenue requirement by Ush 4,420 Million and subsequently the increase in the electricity Retail Tariffs is **Ush 2.3/kWh** on a weighted average basis across consumer categories as indicated in Table 4.

**Table 4**: **Inflation Rate Adjustment Factor (IRAF)**

| | End-User (Retail) Electricity Tariffs (Ush/kWh) | | | | | | |
|---|---|---|---|---|---|---|---|
| | **Domestic** | **Commercial** | **Medium Industrial** | **Large Industrial** | **Extra Large** | **Street-lights** | **Weighted average** |
| Inflation Rate Adjustment Factor (IRAF) | 1.2 | 0.6 | 0.4 | 4.3 | 3.7 | 0.1 | 2.3 |

## 3.3. Fuel Price Adjustment Factor (FPAF)

The Fuel Price Adjustment Factor includes adjustment for changes in the International Fuel Prices, and changes in the Generation Mix from the assumptions used in the determination of the Base Tariffs, and any costs as may be approved by the Authority in the respective quarters.

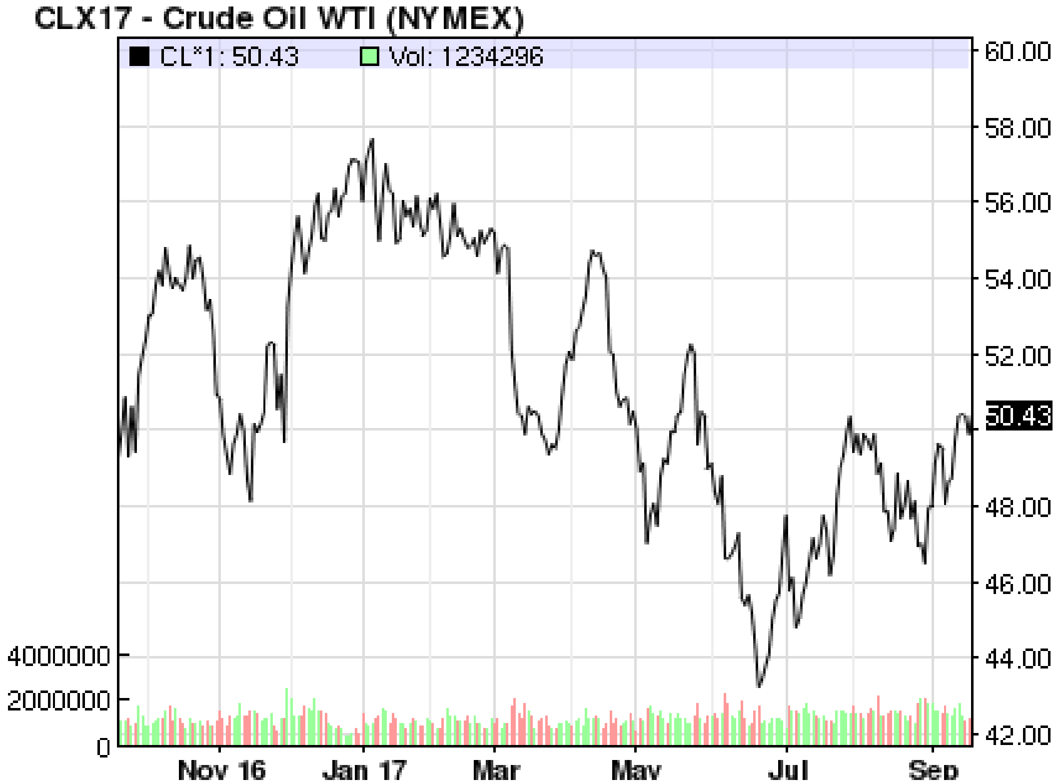
Movement in fuel prices at the International Market affects the cost of generation for the Thermal Generation Plants; Jacobsen Uganda Power Plant Company Limited and Electro-Maxx Uganda Limited. This in turn affects the power purchase costs incurred by UETCL.

Similarly, the changes in the Generation Mix from the assumptions used in determination of the Base Tariffs affect UETCL's power purchase costs and therefore the revenue requirement.

In the 2017 Base Tariffs, the cost of fuel assumed in the Tariff determination was US$ 51.90 per barrel. According to the Organization of Petroleum Exporting Countries (OPEC); as at end of August 2017, the international price of Heavy Fuel Oil (HFO) was US$ 49.6 per barrel. For purposes of the fourth quarter of 2017 Tariff adjustment, the price of Heavy Fuel Oil to be used for electricity generation is US$ 49.6 per barrel. This is equivalent to US$ 369.07 per metric ton compared to US$ 386.2 per Metric ton used in the 2017 Base Tariffs and 366.1 used in the determination of the Tariffs for the third quarter.

The decrease in oil prices has been attributed to increased supply by OPEC and other non OPEC member countries. As shown in Figure 2, the oil prices have been on a downward trend for the most part of 2017 with slight spikes experienced in the months of February and April 2017. However, according to the National Association of Securities Dealers Automated Quotations (NASDAQ), crude oil prices are expected to increase to an average of US$ 51.90 per barrel in the short term, due to expected reduction in production.

**Figure 2: Trend of crude oil prices November 2016 to September 2017**




**Source: http://www.nasdaq.com/markets/crude-oil.aspx?timeframe=6m**

The reduction in the International price of fuel as used in the determination of the Tariffs for the fourth quarter of 2017, compared to the fuel price used in the determination of the 2017 Base tariffs, resulted in an annualised reduction in the projected power purchase costs for UETCL (from Thermal Plants) of Ush 1,841 Million. This leads to a weighted average fuel adjustment factor of **Ush (0.9) /kWh** for the fourth quarter of 2017 as shown in Table 5.

**Table 5: Fuel Price Adjustment Factor (FPAF)**

| | End-User (Retail) Electricity Tariffs (Ush/kWh) | | | | | | |
|---|---|---|---|---|---|---|---|
| | **Domestic** | **Commercial** | **Medium Industrial** | **Large Industrial** | **Extra Large** | **Street-lights** | **Weighted average** |
| Fuel Price Adjustment Factor (FPAF) | (1.1) | (0.9) | (0.9) | (0.9) | (0.9) | (0.9) | (0.9) |

## 3.4. Generation Mix

The fuel adjustment factor includes the adjustment for changes in the dispatch of the generation plants or the Generation Mix relative to the assumptions made in the determination of the Base Tariffs. The changes in the Generation Mix affect energy generated from the respective generation plants and the respective power purchase costs.

### 3.4.1. DEMAND ASSUMPTIONS

#### 3.4.1.1. Maximum Demand

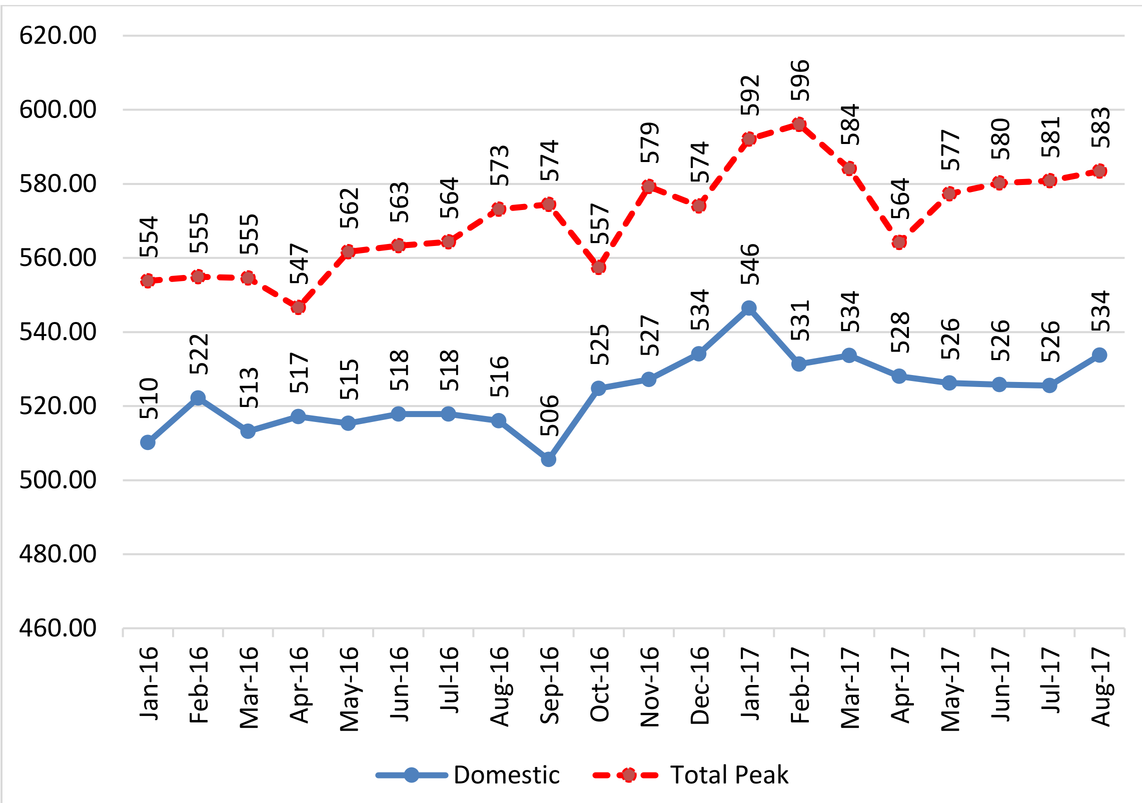
The registered peak system demand in August 2017 (including export of **16.35 MW** to Tanzania and **40.57 MW** Export to Kenya) stood at **583.41 MW** (compared to **580.81 MW** for July 2017). The Uganda peak domestic demand in August 2017 stood at **533.78 MW** (compared to **525.54 MW** for July 2017).

The shoulder peak system demand for August 2017 was recorded at **534.16 MW** (compared to **534.54 MW** for July 2017) and an off-peak maximum system demand of **402.59 MW** (compared to **430.97 MW** for July 2017). The lowest system load registered for August 2017 was **289.54 MW**.

In the fourth quarter of 2017, demand projections put the combined peak domestic demand and export to Tanzania at **563 MW**, a maximum of **502 MW** during the shoulder and a maximum demand of **419 MW** during the off-peak period.

The optimization of available generation supply shall cover projected Domestic demand plus exports to Kenya, with secondary reserve capacity at about 20MW - 72.3 MW. The reserve capacity shall dwindle during the fourth quarter of 2017 when one of the units at Bujagali Energy Limited is shut down for maintenance. The movement in demand is shown in Figure 3.

**Figure 3: Maximum Demand, January 2016 – August 2017**




Economic activities and Gross Domestic Product (GDP) influence electricity demand and consumption. According to the Bank of Uganda's (BOU) policy statement[6], the frequency indicator of economic activity shows that the economy gathered momentum toward the close of the first half of 2017. This further affected the overall demand for electricity. The outlook for 2017, points at a

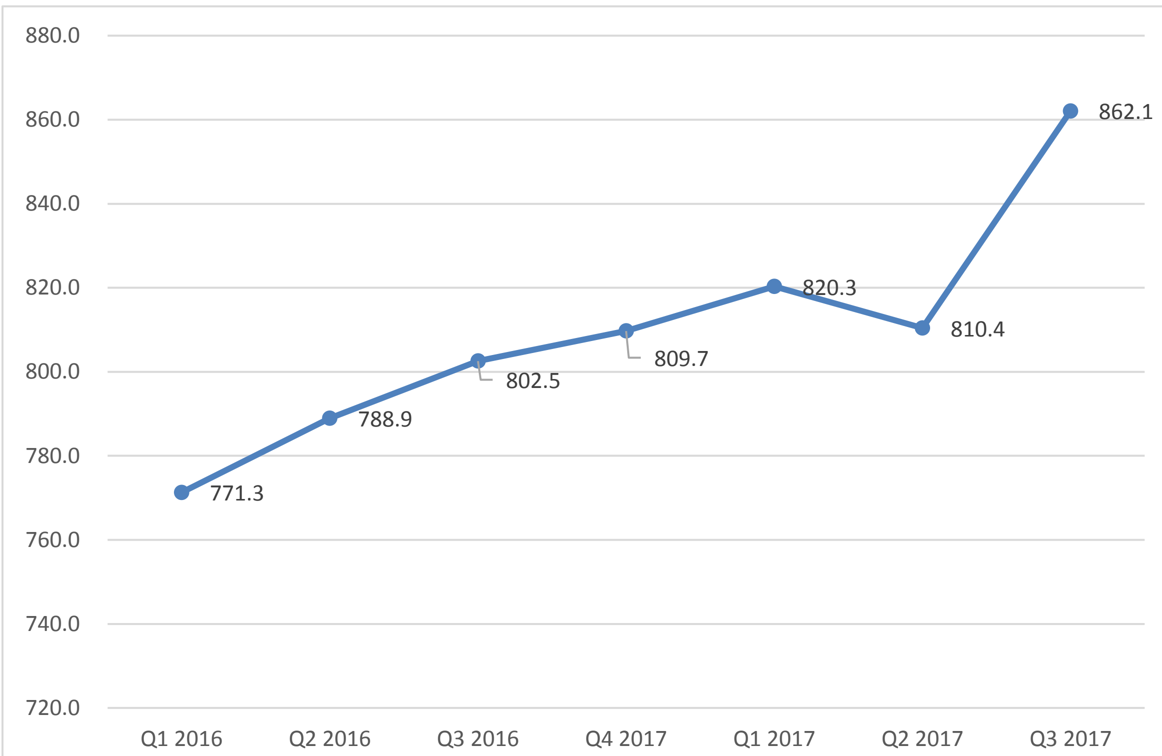
[6] BOU policy statement is available at https://ww.bou.or.ug/bou/monetary_policy/monetary_policy_statements.html

relative improvement in domestic demand following BOU's accommodative monetary policy and recovery in external demand. In October 2017, the Central Bank reduced the Central Bank Rate to 9.5%.

### 3.4.1.2. UETCL energy sales to Umeme Limited

The UETCL energy sales to Umeme Limited have been on an increasing trend as shown in Figure 4.

**Figure 4: UETCL energy sales to Umeme Limited -GWh**




### 3.4.1.3. Energy purchases by UETCL

During the first quarter of 2017 and the subsequent quarters, UETCL was expected to purchase 942.9 GWh from the generation plants and imports. In the third quarter of 2017, UETCL purchased 991.27 GWh, representing growth of 1.53%. In the fourth quarter of 2017, energy purchases by UTECL is expected to be maintained at

991.27GWh on account of improved domestic demand but compensated by reduced export to Kenya. The electricity demand is expected to grow in the fourth quarter of 2017 following the implementation of investments by Umeme Limited geared towards unlocking suppressed demand especially industrial demand in Mukono and Bombo Industrial Parks.

The change in the dispatch for the respective generation plants from the base assumptions used in determination of the 2017 Base Tariffs is shown in Figure 4. Details of the generation plants dispatch is discussed in Annex 1.

**Figure 5: Energy Purchases by UETCL from Large Hydro Plants (GWh)**

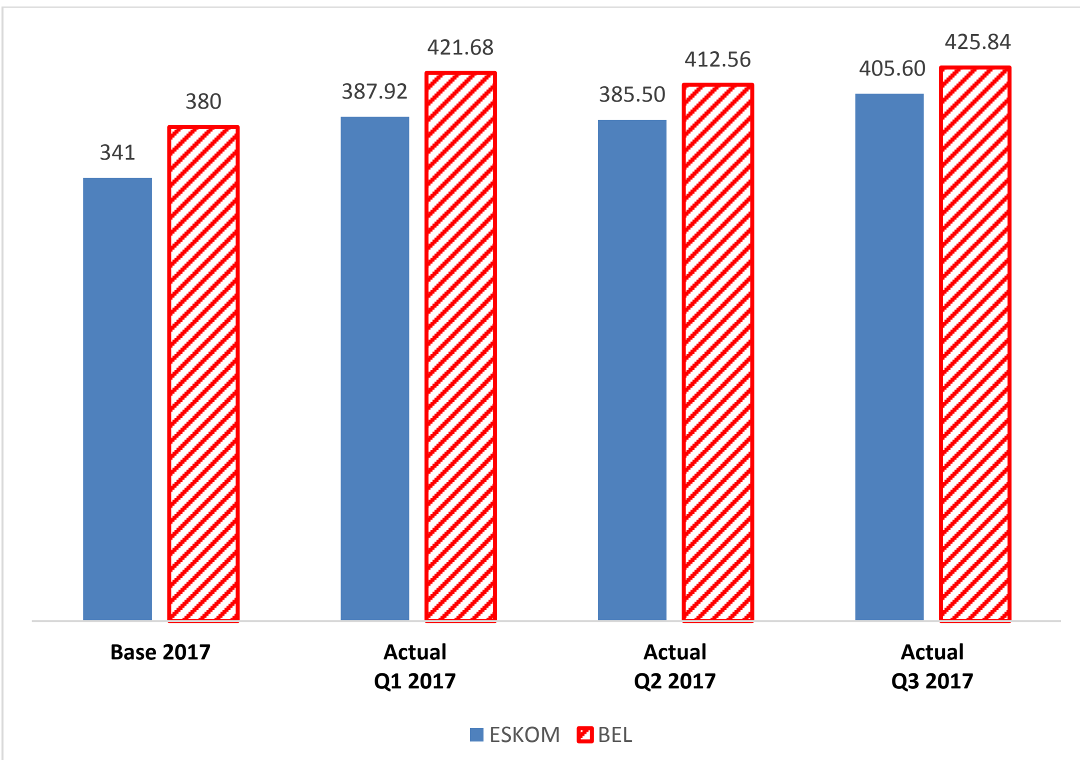
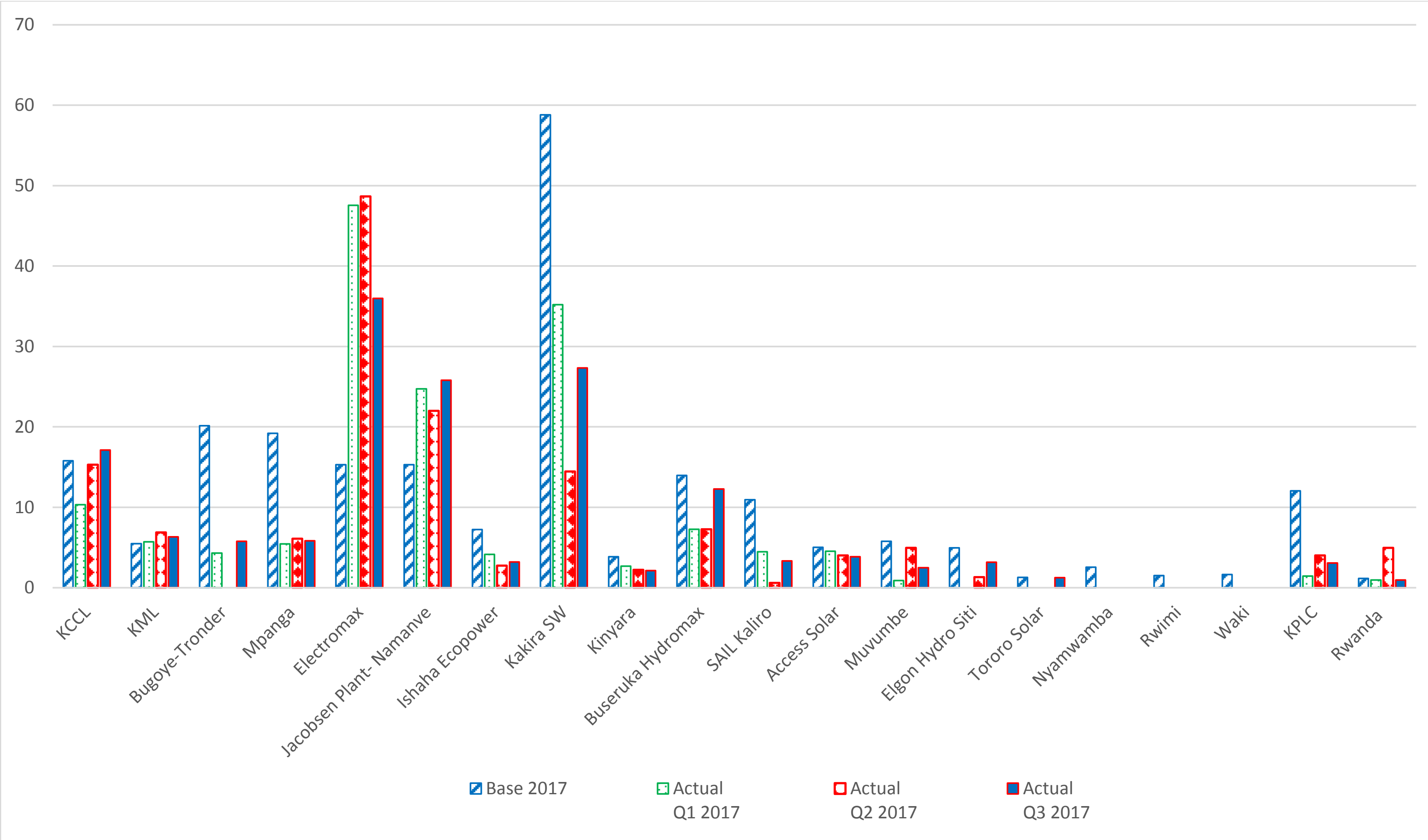


**Figure 6: Energy Purchases by UETCL from Small Hydros, Thermal and Co-generation Plants (GWh)**



The variance between the forecast in the Generation Mix and the outturn for the third quarter of 2017 is attributed mainly to;

(i) The changes in hydrological conditions which affected generation from Mini Hydro Power Plants.

(ii) Decreased generation from Co-generation Bagasse Plants on account of decreased supply of cane from out-growers. The reduction in supply from out-growers had affected generation from Kakira Sugar Limited and Sugar and Allied Industries Limited during both the first and second quarters of 2017.

(iii) Increased dispatch from Large Hydro Power Plants to bridge the deficit created by reduced dispatch from Mini-Hydro Plants and Co-generation Bagasse.

(iv) Break down of the transformer at Tororo UETCL substation thus necessitating dispatch of Electro-Maxx to bridge the demand gap.

(v) Breakdown of Bugoye Hydro Power Plant in Q2 2017.

The detailed discussion is presented in **Annex 1** to this report.

#### 3.4.1.4. Energy Sales by UETCL

The energy purchased by UETCL is adjusted for transmission losses and sold to different distribution companies and exported. Based on the forecast for Q4 2017, UETCL will sell 90.5 percent of the energy to Umeme Limited as shown in Table 6. UETCL is expected to export 7.9 percent of energy and the rest (1.6 percent) will be sold to the small distribution companies in the country.

**Table 6: Energy Sales by UETCL Q1 2017 to Q4 2017**

| Distribution Licensee/export | Q1 2017 Annualized Energy Sales by UETCL (GWh) | %age sales - Q1 2017 | Q3 2017 Annualized Energy Sales by UETCL (GWh) | %age sales – Q3 2017 | Q4 2017 Annualized Energy Sales by UETCL (GWh) | %age sales – Q4 2017 |
|---|---|---|---|---|---|---|
| Umeme Limited | 3,305.60 | 87.63% | 3,274.73 | 90.55% | 3,465.5 | 90.5% |
| UEDCL | 46.10 | 1.22% | 41.92 | 1.16% | 49.6 | 1.3% |
| KIL | 5.20 | 0.14% | 5.68 | 0.16% | 5.4 | 0.1% |
| BECS | 3.30 | 0.09% | 2.72 | 0.08% | 2.7 | 0.1% |
| PACMECS | 2.40 | 0.06% | 1.64 | 0.05% | 2.2 | 0.1% |
| KRECS | 3.30 | 0.09% | 3.04 | 0.08% | 3.5 | 0.1% |
| EXPORT | 406.50 | 10.78% | 286.80 | 7.93% | 302.2 | 7.9% |
| **TOTAL** | 3,772.40 | 100.00% | 3,616.53 | 100.0% | 3,830.9 | 100.0% |

In August 2017, the energy exchange between Uganda and Kenya was a net export of **11,891,530 kWh** from UETCL to Kenya Power and Lighting Company Limited as compared to net export of **22,854,125 kWh** in July 2017. The observed decrease in exports registered in the month of August 2017 was due to lower levels of Power support requested by Kenya Power and Lighting Company Limited owing to improved hydrology at power plants in Western Kenya.

The impact of the change in the Generation Mix is a downward adjustment of the Electricity End-User Tariffs by a weighted average of (7.6) Ush /KWh relative to the Base Tariffs as shown in Table 7.

**Table 7: Generation Mix/Dispatch Adjustment Factor**

| | End-User (Retail) Electricity Tariffs (Ush/kWh) | | | | | | |
|---|---|---|---|---|---|---|---|
| | Domestic | Commercial | Medium Industrial | Large Industrial | Extra Large | Street-lights | Weighted average |
| Exchange Rate Adjustment Factor (FERFAF) | (9.2) | (7.4) | (7.4) | (7.3) | (6.8) | (7.6) | (7.6) |

## 3.5. Adjustments of Operation and Maintenance Costs and Umeme Limited investments

### 3.5.1. Adjustment of the Budget for Uganda Electricity Generation Company Limited

**Mortgage Payment**

The Authority at its 270th meeting, approved a Uganda Electricity Generation Company Limited (UEGCL) budget to be recovered through the Eskom Uganda Limited Capacity Price as part of the Concession Fees. The budget included a loan repayment for the UEGCL House of Ush. 634,536,000. This amount was approved by the Authority for inclusion in the second quarter Tariff adjustment to be recovered over the last three (3) quarters of the Tariff Year 2017. Therefore, the total annualized UEGCL budget considered in the determination of the Tariffs for the fourth quarter of 2017 is **Ush. 7,154,212,000.**

### 3.5.2. UETCL Operation and Maintenance costs for 2017

The Authority approved a Multi-Year Tariff for UETCL for the period 2017-2019. The approved Operation and Maintenance cost for 2017 is Ush 85,245 Million and other revenue of Ush 15,480 Million. The Multi-

Year Tariff and the Tariff Methodology provide that UETCL Operation and Maintenance costs shall be subject to quarterly adjustment for changes in Exchange Rate and Consumer Price Index.

The effective Operation and Maintenance cost for UETCL for the fourth quarter of 2017 is Ush 88,516 Million (including Ush 368 Million approved for Skills development). The effective Operation and Maintenance cost is captured under the inflation and Exchange rate adjustment factors.

#### 3.5.3. Eskom Uganda Limited Operation and Maintenance costs for 2017

The Authority approved Operation and Maintenance cost of Ush 26,619 Million (US$ 9.286 Million) for Eskom Uganda Limited for the Tariff Year 2017. The Eskom Uganda Limited License No. 018 as amended as well as the 2014 approved Quarterly Tariff Adjustment Methodology provide for adjustment of Generation Operation and Maintenance Costs (GOMC) Base parameters for changes in Exchange Rate and Inflation as measured by the Consumer Price Index (CPI).

The effective Operation and Maintenance cost for Eskom Uganda Limited for the fourth quarter of 2017 is Ush 31,540 Million (including Ush 122 Million approved for Skills development). The effective Operation and Maintenance cost is captured under the Inflation and Exchange rate adjustment factors.

### 3.1.1 Umeme Limited Investments for 2012 - 2015

The Umeme Limited Tariff Methodology provides for determination of the distribution revenue requirement comprising of; Operation & Maintenance costs, investment-related costs, and lease/concession fees.

The investment-related costs include; Capital Recovery, Return on Investment, and Corporate Income Taxes.

At the end of every Tariff year, and as part of the Tariff application for the subsequent year, Umeme Limited applies for inclusion in the

Regulatory Asset Base the investments executed by the company. The implemented investments are included in the Regulatory Asset Base and used in the determination of the Distribution Price pending verification by the Authority.

Following the conclusion of the investment verification, a reconciliation is undertaken (if the verified investments are different from those applied for by the Licensee during the determination of the distribution price) on account of; Capital Recovery, Return on Investment, and Corporate Income Taxes.

The Authority at its 279th meeting considered the appeal by Umeme Limited regarding the verified and approved investments for the period 2012-2015. The adjusted investments for Umeme Limited are shown in Table 8.

**Table 8: Verified and Approved Investment for Umeme Limited**

| Tariff Year | Investment implementation Year | Amount in Base Tariff - US$ Million | Adjusted Amount after Appeal - US$ Million |
|---|---|---|---|
| 2011 | 2010 | 18.87 | 18.87 |
| 2012 | 2011 | 25.23 | 25.23 |
| 2013 | 2012 | 25.22 | 25.22 |
| 2014 | 2013 | 39.49 | 39.49 |
| 2015 | 2014 | 49.66 | 57. 51 |
| 2016 | 2015 | 64.32 | 67.47 |
| 2017 | 2016 | 72.50 | **2016 under verification** |

The adjusted investments are more than the investments used in the determination of the 2017 Base Tariffs. In order to avoid further under recovery (on account of the Investments), the approved and adjusted investment after the appeal have been used in the determination of the Distribution Price for the third quarter of 2017 and the same has been used in the determination of the fourth quarter Tariffs.

### 3.5.4. Under recovery on account of adjustment of Umeme Limited Investments

As a result of adjustment of the Umeme Limited investments for the Tariff years 2014 and 2015, a reconciliation has been undertaken. The reconciliation has been undertaken in consideration that Umeme Limited would have earned the investment-related revenue requirement components (Capital Recovery, Return on Investment, and Corporate Income Taxes) between; the respective years in which the investments were executed, and June 2017.

Based on the computation for the period January 2015 to June 2017, Umeme Limited under-recovered Ush 22,945 Million (excluding Corporate Income Taxes) as shown in Table 9. Corporate Income Taxes are reconciled separately in accordance with Amendment No. 2 and No. 4 of the Licence for Supply of Electricity.

**Table 9: Umeme Limited Investment under-recovery**

| | 2014 | 2015 | 2016 | 2017 | | |
|---|---|---|---|---|---|---|
| Taxes Rate | 30.0% | 30.0% | 30.0% | 30.0% | | |
| Capital Recovery | 9.52% | 9.50% | 9.50% | 10.23% | | |
| ROI | 20.0% | 20.0% | 20.0% | 20.0% | | |
| **Approved Investments** | **7,850,478** | **3,158,600** | | | **11,009,078** | |
| | | | | | | |
| **2015** | | | | | | |
| Gross Investments | 7,850,478 | | | | | |
| Accum - CR | - | | | | | |
| Net Investments | 7,850,478 | | | | | |
| | **Capital Recovery** | **ROI** | **Taxes** | **Total -USD** | **Average Ex Rate** | **Total - Ush** |
| 2015 Under Recovery | 745,795 | 1,570,096 | - | 2,315,891 | 3,097 | **7,171,622,586** |
| | | | | | | |
| **2016** | | | | | | |
| Gross Investments | 11,009,078 | | | | | |
| Accum - CR | 745,795 | | | | | |
| Net Investments | 10,263,283 | | | | | |
| | **Capital Recovery** | **ROI** | **Taxes** | **Total -USD** | **Average Ex Rate** | **Total - Ush** |
| 2016 Under Recovery | 1,045,862 | 2,052,657 | - | 3,098,519 | 3,361 | **10,415,539,689** |
| | | | | | | |
| **2017** | | | | | | |
| Gross Investments | 11,009,078 | | | | | |
| Accum - CR | 1,791,658 | | | | | |
| Net Investments | 9,217,420 | | | | | |
| | **Capital Recovery** | **ROI** | **Taxes** | **Total -USD** | **Average Ex Rate** | **Total - Ush** |
| 2017 (Jan -June )Under Recovery | 563,206 | 921,742 | - | 1,484,948 | 3,608 | **5,358,368,068** |
| | | | | | | |
| | | | | | **Total** | **22,945,530,343** |

This amount – Ush 22,945 Million has been provided for in the computation of the distribution price for the fourth quarter of 2017.

### 3.5.5. Power Supply reconciliation for January 2010 to June 2017.

On 23rd August 2017, Umeme Limited wrote to the Electricity Regulatory Authority requesting the Authority to consider Ush 87,736 Million as Power Supply Price (PSP) reconciliation for the period ended June 2017.
The Authority noted that there can only be a PSP reconciling amount under the following circumstances;-

(a) When the Distribution Loss Factor target approved by the Authority is different from the outturn.
(b) When the loss allocation per customer category assumed when setting the Tariff is different from the outturn.
(c) When the percentage of total energy consumed by the different customer categories assumed at setting the Tariff is different from the outturn.
(d) When the load profile per customer category used for Tariff setting is different from the outturn.

The reconciling amount should be ZERO when all the parameters used for Tariff setting are the same as the outturn.

The Authority noted that over the years, Umeme Limited had reported that the company failed to achieve the Regulatory Tariff Performance Targets with respect to; Overall Distribution Loss Factor, Target Uncollected Debt Factor, and over spent on the Distribution Operation and Maintenance Costs (DOMC) in comparison to the targets approved by the Authority and as used in the determination of the Distribution Price.

In the same periods, Umeme Limited continued to claim Power Supply Price reconciliations for among other reasons failure to achieve; the energy loss target set by the Authority, load profile, and energy sales per customer category used/assumed in the determination of the Distribution Price.

The Authority notes that despite the reported failure by Umeme Limited to achieve the Regulatory Tariff Performance Targets;

a) The company's effective Return on Investment (ROI) as reported in the audited financial statements is higher than the allowed ROI included in the Tariff Model and used in the determination of the distribution price for the Tariff Year 2014.
b) In 2015, Umeme Limited was able to achieve an effective ROI similar to the ROI used in determination of the Distribution Price.
c) Umeme Limited reports a gross profit (in the audited financial statements) higher than the distribution revenue requirement used in the determination of the Distribution Price.

Based on the above background, the Authority undertook an analysis of the financial and commercial performance of Umeme Limited for the Tariff Years 2014, 2015 and 2016. This review has taken into consideration the assumptions used for Tariff determination, the reporting by the company to ERA, and the audited financial statements for the years ended 31st December 2014, 31st December 2015, and 31st December 2016.

Umeme Limited, however, did not satisfactory respond to commercial and financial performance queries undertaken by the Electricity Regulatory Authority in respect to the Power Supply Price reconciliation.

Based on the forgoing, the amounts claimed have not been included in the computation of the fourth quarter Tariffs.

### 3.5.6. Utilization of the Tariff Stabilization Fund

At the time of tariff determination, the Authority makes assumptions specifically in respect to demand, energy sales and energy purchases by UETCL. At the end of every Tariff Year, the Authority undertakes a reconciliation between the assumptions used in determination of the Bulk Supply Tariff and the outturn as reported by UETCL, the generators and Umeme Limited.

The Authority considered that any under-recoveries or over-recoveries by UETCL in the fourth quarter of 2017 will be reconciled against the funds on the Tariff Stabilization Fund approved by the Authority. The Authority intends to undertake the reconciliation of the Tariff Year 2017 in the first quarter of 2018.

### 3.6. Overall Tariff Adjustment Factor

The applicable Tariff adjustment for the fourth quarter of 2017 is the sum of the Exchange Rate Adjustment Factor, Inflation Adjustment Factor and Fuel Price Adjustment Factor from the Base Tariff and assumptions. The adjustment factors for the fourth quarter of 2017 are as shown in Table 10.

**Table 10: Total Tariff Adjustment Factors Q4 2017 from the Base Tariffs**

| | **Domestic** | **Commercial** | **Medium Industrial** | **Large Industrial** | **Extra Large** | **Street-lights** | **Weighted average** |
|---|---|---|---|---|---|---|---|
| Inflation Rate Adjustment Factor (IRAF) | 1.2 | 0.6 | 0.4 | 4.3 | 3.7 | 0.1 | 2.3 |
| Exchange Rate Adjustment Factor (FERFAF) | (2.2) | (2.2) | (1.9) | (4.3) | (4.2) | (1.8) | (3.1) |
| Fuel Price Adjustment Factor (FPAF) | (10.3) | (8.3) | (8.3) | (8.2) | (7.7) | (8.5) | (8.6) |
| Fuel Price Adjustment Factor | (1.1) | (0.9) | (0.9) | (0.9) | (0.9) | (0.9) | (0.9) |
| Energy Mix Adjustment factor | (9.2) | (7.4) | (7.4) | (7.3) | (6.8) | (7.6) | (7.6) |
| **Total Tariff Adjustment** | (11.3) | (9.9) | (9.8) | (8.2) | (8.2) | (10.2) | (9.4) |

# 4 REVENUE REQUIREMENT, TARIFF AND SUBSIDY IMPLICATIONS

## 4.1 Revenue Requirement Implications

The annualized revenue requirement for the Electricity Industry is shown in Table 11.

**Table 11: Summary of Revenue Requirement**

| | **Eskom Generation** | | | | **Transmission** | | | | **Other power purchases** | **Export revenues** | **Distribution** | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Total** | Asset related | O&M | Lease fee | **Total** | Asset related | O&M | Levies & Funds | **Total** | **Total** | **Total** | Asset related | O&M | Lease fee |
| | USh mill | USh mill | USh mill | USh mill | USh mill | USh mill | USh mill | USh mill | USh mill | USh mill | USh mill | USh mill | USh mill | USh mill |
| Q1 2017 | 54,440 | 13,011 | 34,860 | 6,569 | 126,122 | - | 93,600 | 32,522 | 960,044 | 73,212 | 558,445 | 394,147 | 158,383 | 5,915 |
| Q2 2017 | 65,779 | 12,855 | 34,962 | 17,962 | 124,579 | - | 94,092 | 30,488 | 958,709 | 106,502 | 568,208 | 402,913 | 159,452 | 5,844 |
| Q3 2017 | 59,622 | 17,010 | 35,197 | 7,415 | 125,176 | - | 94,841 | 30,334 | 959,774 | 197,193 | 571,426 | 404,703 | 160,852 | 5,870 |
| Q4 2017 | 55,524 | 12,904 | 35,205 | 7,415 | 132,177 | - | 94,875 | 37,302 | 892,656 | 183,380 | 663,061 | 496,233 | 160,962 | 5,866 |

In the determination of Tariffs for the fourth quarter of 2017, the annualized revenue requirement for Eskom Uganda Limited is projected to increase to Ush 55,524 Million in the fourth quarter of 2017 from Ush 54,440 Million used in the determination of the 2017 Base Tariffs and Ush 59,622 Million used in the determination of the third quarter Tariffs. The increase is largely driven by;

(i) Adjustment for Consumer Price Index leading to an increase in the local content of the Operation and Maintenance costs, and
(ii) Adjustment of the 2017 annual budget for Uganda Electricity Generation Company Limited leading to increase in Concession Fees.

The reduction in the Eskom Uganda Limited revenue requirement between the third quarter 2017, and the fourth quarter of 2017 is on account of the allowance recovery of investment costs of Eskom in the third quarter of 2017 which have not been included in the computation of the fourth quarter tariffs.

The appreciation of the Uganda Shilling against the United States Dollar cushioned the increase in the Uganda Shilling equivalent asset-related costs.

Due to the changes in the Generation Mix mainly attributed to the increase in dispatch from Eskom Uganda Limited and Bujagali Energy Limited during the third quarter of 2017 and the reduced dispatch from Thermal Plants and Mini Hydros, the annualized power acquisition costs (excluding the capacity payments to all Thermal Generators) reduced from Ush 959,774 Million used in the determination of Tariff for the third quarter of 2017 to Ush 949,456 Million in the fourth quarter of 2017.

The annualized revenue requirement for Umeme Limited has increased from Ush 558,445 Million provided for in the Tariff for Q1 2017 to Ush 663,061 Million in Q4 of 2017 (despite the appreciation of the Uganda Shilling against the United States Dollar), mainly on account of adjustment for the 2014 and 2015 approved and verified investments and recovery of arrears.

There was an increase in the Operation and Maintenance cost component of Umeme Limited from Ush 158,383 Million in Q1 2017 to Ush 160,962 Million in Q4 2017. The increase is on account of adjustment for Consumer Price Index for the local content of the Operation and Maintenance Costs.

The increase in the annualized asset-related costs from Ush 394,147 Million in Q1 2017 to Ush 496,233 Million in Q4 2017 is on account of the adjustment for the 2014 and 2015 approved and verified investments, and provision for recovery of the under-recovery.

### 4.1.1 Capacity Price for Eskom Uganda Limited

The Capacity Price for Eskom Uganda Limited will increase from Ush 43,112 per MW per hour in Q1 2017 to Ush 43,970 per MW per hour in Q4 2017 as shown in Table 12. The increase is attributed to increased costs on account of adjustment of local content Operation and

Maintenance costs for Consumer Price Index, and adjustment to the 2017 annual budget for Uganda Electricity Generation Company Limited.

### Table 12: Eskom Capacity Price for Q3 2017

| | Average Capacity Price | Total costs | Investment component | Capital recovery charges | Return on investment | Net accumulated investment | Income taxes payable | O&M component | USh-portion of O&M | US$-portion of O&M | Concession fee |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | IN y, q | CR y | RT y | NI y | TX y | OM y, q=1 | LOM y, q | EOM y, q | LP y, q=1 |
| | CP y.q | USh mill | USh mill | US$ thous | US$ thous | US$ thous | US$ thous | Ush mill | Ush mill | Ush mill | US$ thous |
| | Ushs/ MW | | | | | | | | | | |
| Q1 2017 | 43,112 | 54,440 | 13,011 | 1,098 | 1,740 | 14,500 | 746 | 34,860 | 18,145 | 13,049 | 6,569 |
| Q2 2017 | 52,092 | 65,779 | 12,855 | 1,098 | 1,740 | 14,500 | 746 | 34,962 | 18,403 | 12,893 | 17,962 |
| Q3 2017 | 47,216 | 59,622 | 17,010 | 1,098 | 1,740 | 14,500 | 746 | 35,197 | 18,582 | 12,950 | 7,415 |
| Q4 2017 | 43,970 | 55,524 | 12,904 | 1,098 | 1,740 | 14,500 | 746 | 35,205 | 18,598 | 12,942 | 7,415 |

### 4.1.2 Bulk Supply Tariff (BST)

The annualized Bulk Supply costs have reduced from Ush 1,118,908 Million in Q1 2017 (2017 Base) to Ush 1,101,230 Million in Q4 2017. The sales to distribution companies have increased from 3,413 GWh in Q1 2017 to 3,465 GWh in Q4 2017. As a result, the Bulk Supply Tariffs have reduced from Ush 373.5/kWh, Ush 287.3/kWh, and Ush 181.1/kWh at Peak, Shoulder and Off-peak periods respectively, to Ush 327.0/kWh, Ush 251.5/kWh, and Ush 158.5/kWh for the respective Time of Use periods in Q4 2017, as shown in Table 13.

### Table 13: BULK SUPPLY COSTS AND RESULTANT BULK SUPPLY TARIFFS (BST)

| | Peak price | Shoulder price | Off-peak price | Sales to distrib-utors | Total costs | Power Purchase Costs | Trans-mission costs | Total asset related costs | Total O&M component | Other |
|---|---|---|---|---|---|---|---|---|---|---|
| | USh/kWh | USh/kWh | USh/kWh | GWh | USh mill | USh mill | USh mill | Ush mill | Ush mill | Ush mill |
| Q1 2017 | 379.9 | 292.2 | 184.1 | 3,413 | 1,118,908 | 992,786 | 126,122 | 6,412 | 87,188 | 32,522 |
| Q2 2017 | 371.7 | 286.0 | 180.3 | 3,329 | 1,094,514 | 969,934 | 124,579 | 6,336 | 87,756 | 30,488 |
| Q3 2017 | 365.5 | 281.2 | 177.3 | 3,323 | 1,179,110 | 1,053,934 | 125,176 | 6,364 | 88,478 | 30,334 |
| Q4 2017 | 327.0 | 251.5 | 158.5 | 3,465 | 1,052,831 | 920,654 | 132,177 | 6,360 | 88,516 | 37,302 |

The reduction in the Bulk Supply Tariff despite the increase in power purchase costs is on account of increased export sales to Kenya

Power and Lighting Company Limited. The increase power purchase costs incurred by UETCL is offset by the increase in export revenue by UETCL. The annualized bulk supply costs before off setting exports increased by 2.07% between Q1 2017 and Q4 2017 and the sales to distributors increased by 1.53% over the same period, leading to reduction in the Bulk Supply Tariff.

The changes in the Energy Generation Mix and changes in the Exchange rate of the Uganda Shilling against the United States Dollar affect the actual power purchase costs by UETCL. It is therefore expected that UETCL will either under recover or over recover (at the proposed Bulk Supply Tariff) during the fourth quarter. At the end of every Tariff Year, the Authority undertakes reconciliation for UETCL to establish the actual under/over recovery. The under/over recovery is considered as part of the tariff determination for the subsequent Tariff Year.

# 5 RETAIL TARIFFS

In accordance with Amendment No. 2 of the Umeme Limited Licence No. 48 for Supply of electricity, the Retail Tariff charges for electric service shall be subject to and liable for automatic Fuel cost adjustment, Foreign Exchange rate fluctuation adjustment, and an automatic adjustment for Inflation that will be calculated in accordance with such formulae as determined by the Authority.

The quarterly adjustment factors and the resulting End-User Tariffs across the customer categories for Q4 2017 are as shown in Table 14.

## Table 14: Q4 2017 Adjustment Factors and resultant End-User Tariffs

| | End-User (Retail) Electricity Tariffs (Ush/kWh) | | | | | | |
|---|---|---|---|---|---|---|---|
| | **Domestic** | **Commercial** | **Medium Industrial** | **Large Industrial** | **Extra Large** | **Street-lights** | **Weighted average** |
| 2017 Approved Base Tariffs | 696.9 | 629.0 | 577.8 | 376.3 | 372.8 | 679.7 | 513.2 |
| | | | | | | | |
| | **Tariff Adjustment Factors (Ush/kWh) for Q4 2017** | | | | | | |
| Inflation Rate Adjustment Factor (IRAF) | 1.2 | 0.6 | 0.4 | 4.3 | 3.7 | 0.1 | 2.3 |
| Exchange Rate Adjustment Factor (FERFAF) | (2.2) | (2.2) | (1.9) | (4.3) | (4.2) | (1.8) | (3.1) |
| (a + b) = Fuel Price Adjustment Factor (FPAF) | (10.3) | (8.3) | (8.3) | (8.2) | (7.7) | (8.5) | (8.6) |
| (a) Fuel Price Adjustment Factor | (1.1) | (0.9) | (0.9) | (0.9) | (0.9) | (0.9) | (0.9) |
| (b) Energy Mix Adjustment factor | (9.2) | (7.4) | (7.4) | (7.3) | (6.8) | (7.6) | (7.6) |
| **Total Tariff Adjustment** | (11.3) | (9.9) | (9.8) | (8.2) | (8.2) | (10.2) | (9.4) |
| **Approved Q4 2017 Tariff** | 685.6 | 619.1 | 568.0 | 368.1 | 364.6 | 669.5 | 503.8 |
| **Approved Q3 2017 Tariff** | 686.0 | 619.6 | 568.8 | 369.0 | 365.8 | 670.0 | 504.6 |
| **Approved Q2 2017 Tariff** | 687.1 | 620.9 | 569.7 | 370.2 | 366.9 | 671.2 | 505.8 |
| Percentage Change from Q3 2017 | -0.1% | -0.1% | -0.1% | -0.3% | -0.3% | -0.1% | -0.2% |

The resultant Capacity Price, Bulk Supply Tariff, and End-User Tariff at the respective Time of Use periods is shown in Table 15.

## Table 15: The resultant tariff at the different Time of Use periods for Q4 2017

| | | | | | | |
|---|---|---|---|---|---|---|
| Eskom Uganda Capacity Price | 43,970 | Ush/MW per hour | | | | |
| | Peak | Shoulder | Off-Peak | | | |
| Bulk Supply Tariff Ush/kWh | 326.5 | 251.2 | 158.3 | | | |
| | | | | | | |
| | **End-User (Retail) Electricity Tariffs (Ush/kWh)** | | | | | |
| | **Domestic** | **Commercial** | **Medium Industrial** | **Large Industrial** | **Extra Large** | **Street-lights** |
| | **2017 Base Tariffs - Ush /kWh** | | | | | |
| Average | 696.9 | 629.0 | 577.8 | 376.3 | 372.8 | 679.7 |
| Peak | | 815.9 | 747.9 | 498.2 | 493.1 | |
| Shoulder | | 628.1 | 575.7 | 383.5 | 379.6 | |
| Off peak | | 391.5 | 355.6 | 244.5 | 243.3 | |
| | **Tariff Adjustment Factors (Ush/kWh) for Q4 2017** | | | | | |
| Inflation Rate Adjustment Factor (IRAF) | 1.2 | 0.6 | 0.4 | 4.3 | 3.7 | 0.1 |
| Exchange Rate Adjustment Factor (FERFAF) | (2.2) | (2.2) | (1.9) | (4.3) | (4.2) | (1.8) |
| (a + b) = Fuel Price Adjustment Factor (FPAF) | (10.3) | (8.3) | (8.3) | (8.2) | (7.7) | (8.5) |
| (a) Fuel Price Adjustment Factor | (1.1) | (0.9) | (0.9) | (0.9) | (0.9) | (0.9) |
| (b) Energy Mix Adjustment factor | (9.2) | (7.4) | (7.4) | (7.3) | (6.8) | (7.6) |
| **Total Tariff Adjustment** | **(11.3)** | **(9.9)** | **(9.8)** | **(8.2)** | **(8.2)** | **(10.2)** |
| | **Approved Q4 2017 end-user Tariff in Ush /kWh** | | | | | |
| Average | 685.6 | 619.1 | 568.0 | 368.1 | 364.6 | 669.5 |
| Peak | | 806.0 | 738.0 | 490.0 | 484.9 | |
| Shoulder | | 618.1 | 565.9 | 375.3 | 371.4 | |
| Off peak | | 381.6 | 345.7 | 236.3 | 235.1 | |

## ANNEX 1: ENERGY DISPATCH AND GENERATION MIX USED FOR FOURTH QUARTER TARIFF DETERMINATION

### Eskom Uganda Limited (380 MW)

At the time of determination of the Base Tariffs for 2017, it was assumed that the water release at the Nalubaale-Kiira complex would be 900 Cumecs for the greater part of the year. In order to cover for the shortfall arising from reduced dispatch from the Mini-Hydro Plants, the water release was increased to 1,000 Cumecs during the first quarter of 2017. At a water release of 1,000 cumecs, Eskom Uganda Limited was able to generate 399.1 GWh in the fourth quarter of 2017 compared to 341.0 GWh used in the determination of the 2017 Base Tariffs.

The increase is on account of the sustained water release of 1,000 Cumecs and delayed improvement of hydrology conditions affecting generation from Mini-Hydro Power Plants.

The quarterly power purchase costs for Eskom Uganda Limited are expected to slightly increase from Ush 13.6 Billion in the first quarter of 2017 to Ush 13.9 Billion in the fourth quarter of 2017. The increase is mainly on account of the adjustment of the annual budget for UEGCL and provision for under-recovery of Investments in the fourth quarter of 2017.

### Bujagali Energy Limited (250 MW)

The generation and dispatch from Bujagali Energy Limited is a direct result of the water release at the complex which is around 112% more efficient than the Nalubaale-Kiira Power Plant operated by Eskom Uganda Limited. Bujagali Energy Limited is expected to complete the routine maintenance of one of its units in October 2017. The company is expected to continue conducting routine maintenance shutdowns/outages in the fourth quarter of 2017, at the rate of one unit each month up to October 2017. This indicates that the plant will have one unit not fully operational during the month of October 2017.

Considering the plant maintenance schedule and expected water release, Bujagali Energy Limited is expected to generate 425.8 GWh in the fourth quarter of 2017, compared to 380.0 GWh used in the determination of the 2017 Base Tariffs.

UETCL is expected to incur Ush 143.1 Billion in the fourth quarter of 2017 on account of purchasing energy from Bujagali Energy Limited.

**Africa EMS Mpanga Ltd (18 MW)**

During the first and second quarters of 2017, the country experienced unfavorable hydrology conditions which resulted into lower than planned dispatch from most Mini Hydros. In the fourth quarter of 2017, Mpanga Hydro Power Plant is expected to generate 5.8 GWh compared to 19.21 GWh used during the setting of the Base Tariffs.

The catchment areas for Mpanga Hydro Power Plant are expected to experience the improved hydrology conditions in the fourth quarter of 2017. The power plant is expected to generate 8.1 GWh in the fourth quarter.

The Authority approved a phased tariff for Africa EMS Mpanga of US cents 9/KWh for the first six years and US cents 6.66/KWh for the rest of the License period. The Power Plant achieved Commercial Operations Date in March 2011. In March 2017, the Power Plant switched to Phase two of the Tariff Structure. The weighted average Tariff for Africa EMS Mpanga in 2017 is US cents 7.24/KWh.

The power purchase costs are expected to reduce from Ush 5.1 Billion used in the determination of the 2017 Base Tariffs to Ush 1.5 Billion in the fourth quarter of 2017. The reduction is mainly on account of the reduction in generation and lower Tariff in phase two of the Tariff structure.

**Bugoye Power Limited – Bugoye (13 MW)**

Bugoye Power Limited generated 4.31 GWh in the first quarter of 2017. During the same quarter, the plant experienced mechanical breakdown when the penstock burst and was switched off on 13th February 2017 to enable the company address the mechanical breakdown. The repairs on the penstock were completed in August 2017 and the plant is expected to generate 17.28 GWh during the fourth quarter of 2017. Accordingly, UETCL is expected to purchase 13.28 GWh (compared to 20 GWh used in the determination of the Base Tariffs) at power purchase costs of Ush 5.5 Billion from Bugoye Power Plant during the fourth quarter of 2017.

**Kasese Cobalt Company Ltd - KCCL (10.5 MW)**

Kasese Cobalt Company Limited Power Plant generated 15.75 GWh in the second quarter of 2017 compared to 15.77 GWh used in the determination of the 2017 Base Tariffs.

The power plant is expected to experience better hydrology conditions in the fourth quarter of 2017, and is therefore expected to generate 17.1GWh during the quarter.

UETCL power purchase costs for Kasese Cobalt Company Limited Power Plant are expected to increase marginally from Ush 3.271 Billion used in the Base Tariffs to Ush 3.55 Billion in the fourth quarter of 2017. The increase in power purchase costs is mainly on account of increment in generation.

**Tibet Hima Limited – KML (5 MW)**

Mobuku 1 Hydropower Plant operated by Tibet Hima Limited (formerly Kilembe Mines Limited) has an installed capacity of 5 MW. The power plant was not adversely affected by the drought conditions (because of the different catchment area) and generated 5.72 GWh in the first quarter of 2017 compared to 5.48 GWh assumed in the determination of the 2017 Base Tariffs. The hydrology improved in the third quarter of 2017 and the power plant is expected to generate 6.3 GWh in the fourth quarter of 2017.

UETCL power purchase costs for Tibet Hima Limited are expected to increase from Ush 481 Million assumed in the 2017 Base Tariff to Ush

555 Million during the fourth quarter of 2017. The increase is mainly on account of increased dispatch. The Tariffs of KML is in Uganda Shillings and therefore the power purchase costs are not subjected to changes in Exchange Rate.

**Eco Power-Ishasha (6.5 MW)**

Eco Power Ishasha Power Plant is estimated to generate 3.2 GWh by the end of the third quarter of 2017. The Plant is projected to dispatch the same energy in the fourth quarter of 2017.

The power purchase costs are expected to reduce from Ush 1.9 Billion used in the determination of the 2017 Base Tariffs to Ush 841 Million in the fourth quarter of 2017. The reduction in power purchase costs is on account of reduction in generation.

**Hydromax Limited - Buseruka (9 MW)**

The plant is expected to dispatch 6.95 GWh by the end of the third quarter of 2017 compared to 14.0 GWh used in the determination of the 2017 Base Tariffs. This is as a result of lower hydrology as well as constraints in the power evacuation line. UETCL is expected to commission the Hoima substation by the end of September 2017, which will help in the evacuation of the plant. It is therefore projected that the plant will dispatch 12.3 GWh in the fourth quarter of 2017.

The Power Purchase costs for Hydromax are expected to decrease from Ush 4.8 Billion in the 2017 Base Tariff to Ush 4.2 Billion in the fourth quarter of 2017. The decrease in the power purchase costs is on account of the decrease in energy dispatch from the power plant.

**Muvumbe Hydro Power Plant (6.5 MW)**

The project started construction in the fourth quarter of 2015 and achieved Commercial Operations Date in March 2017 after inspection and tests carried out by UETCL and Umeme Limited. The power plant is expected to generate 2.5 GWh in the fourth quarter of 2017.

UETCL is expected to incur power purchase costs amounting to Ush 2.0 Billion arising from energy purchases from Muvumbe Hydro Power Plant for the fourth quarter of 2017, based on a Generation Tariff of US cents 9.4/Kwh as approved by the Authority.

**Siti 1 Hydro Power Plant (5 MW)**

Siti 1 Hydro Power Plant started construction in the third quarter of 2015 and was commissioned in April 2017, the plant is expected to supply 3.2 Gwh to the grid for the fourth quarter of 2017.

UETCL is expected to incur power purchase costs amounting to Ush 1.8 Billion arising from energy purchases from Siti 1 Hydro Power Plant based on a generation Tariff of US cents 10.0/Kwh as approved by the Authority.

**Nyamwamba Hydro Power Plant (9 MW)**

Nyamwamba Hydro Power Plant had been expected to be commissioned in October 2017 and generate 10.2 GWh in 2017 based on the installed capacity, the plant factor and expected days of generation in 2017. However, it was reported that the project experienced delays and is expected to be completed in December 2017.

The expected generation from the power plant is spread over the four (4) quarters 2017. UETCL is expected to incur Ush 3.2 Billion in 2017 for Power Purchase Costs from the power plant at the approved Tariff of US Cents 8.5/kWh. This has not been included in the fourth quarter computations.

**Rwimi Hydro Power Plant (5.5 MW)**

Rwimi Hydro Power Plant was expected to be commissioned in October 2017. The plant was expected to generate 6.0 GWh in 2017 based on installed capacity, the plant factor and expected days of generation in 2017. However, this was not achieved and the plant is expected to be commissioned in the first quarter of 2018.

Rwimi Hydro Power Plant was expected to sell energy to UETCL at US cents 9.8/Kwh at a cost of Ush 2.0 Billion in 2017 on account of UETCL power purchase costs. This has now been adjusted to zero in the computation of the Retail Tariffs for the fourth quarter of 2017.

**Waki Hydro Power Plant (4.8 MW)**

Waki Hydro Power Plant was expected to be commissioned in October 2017 and generate 6.6 GWh in 2017 based on the installed capacity, plant factor and expected days of generation in 2017. However, it was noted that the company has not been able to achieve the commissioning date and is expected to commission in the first quarter of 2018.

UETCL is not expected to incur purchase costs on account of dispatch of the Waki Hydro Power Plant as had been envisaged in the base tariffs.

**Kakira Sugar Limited (52 MW)**

Kakira Sugar Limited generated 15.48 GWh during the second quarter of 2017. The plant has experienced some challenges of reduced access to cane/fuel.

The cane/fuel challenge was caused by the development of a number of other sugar manufacturing companies in the same area with limited expansion of sugar cane plantations, leading to competition for cane. The generation for the fourth quarter is expected to be 15.4 GWh.

UETCL power purchase costs for the Kakira Sugar Limited energy are expected to decrease from Ush 20.7 Billion used in the Base Tariffs of 2017 to Ush 9.6 Billion in the fourth quarter of 2017. The reduction in power purchase costs is mainly on account of decreased generation from the power plant.

**Kinyara Sugar Ltd (5.0 MW)**

During the second quarter of 2017, the plant generated and sold 2.40 GWh to the National Grid compared to 3.9 GWh anticipated in the

Base Tariffs of 2017. The reduction in power generation is mainly on account of lower access to cane/fuel, and power evacuation challenges on the Hoima-Masindi 33KV line. The works on the evacuation line are expected to be completed in the fourth quarter of 2017. The plant is expected to generate 2.1 GWh during the fourth quarter of 2017.

The Kinyara power purchase costs are expected to decrease from Ush 1.14 Billion used in the Base Tariffs of 2017 to Ush 0.62 Billion in the fourth quarter of 2017 on account of decreased generation from the power plant.

**Sugar and Allied Industries Limited (SAIL)**

Sugar and Allied Limited was commissioned in 2013, generating power for own use. The plant was then connected to the Grid in 2015 with an installed capacity of 11.5 MW, with 6.5 MW committed to the National Grid. The plant, however, experienced constraints in cane supply and therefore supplied limited capacity to the National Grid.

SAIL supplied 0.56 GWh to the National Grid in the second quarter of 2017 compared to 11.0 GWh used in the Base Tariffs for 2017. The generation by the plant is projected at 3.3 GWh during the third quarter of 2017 and the challenge of access to cane /fuel for the plant is expected to be sustained in the fourth quarter of 2017.

The Sugar and Allied Power Purchase costs are expected to reduce to Ush 0.118 Billion in the fourth quarter of 2017 from Ush 3.86 Billion used in the Base Tariffs of 2017 on account of reduced generation from the Power Plant.

**Electro-Maxx Ltd Tororo (50 MW)**

In February 2017, the Authority approved UETCL's request to dispatch the Thermal Plants above the 7 MW minimum dispatch implemented by the Authority. The request by UETCL was premised on requirement to increase export to Kenya to 50 MW.

In the second quarter of 2017, Electro-Maxx generated 52.68 GWh. The generation from the Thermal Plants is expected to change based on the power export requirement to Kenya during the fourth quarter of 2017. The plant is expected to generate 30.9 GWh in the fourth quarter of 2017 as support to Kenya and the Eastern part following the installation of an alternative transformer at the Tororo Substation to support the previously overloaded transformer.

The power purchase costs are expected to increase from Ush 10.14 Billion in the Base Tariffs to Ush 20.5 Billion in the fourth quarter of 2017. This is due to the increased generation requirement to meet the Kenya Export. The prices of fuel on the international market are expected to be stable into the fourth quarter of 2017.

Whereas the Authority approved renewal of the Electro-Maxx Uganda Limited Licence and change of the Tariff structure, the effective date for the Authority's decision is 1st November 2017.

**Jacobsen Uganda Power Plant Company Limited - Namanve (50 MW)**

The License for Jacobsen expired on 14th September 2016. The company applied for renewal of its License. The Authority approved a one year license renewal. The company commenced generation in the fourth quarter of 2016. In the third quarter of 2017, the plant generated 24.86 GWh and is expected to generate 25.8 GWh in the fourth quarter of 2017 at a cost of Ush 16.8 Billion.

**Access Solar TSK (10 MWp)**

The plant was procured through a competitive bidding process under the Global Energy Transfer Feed-in-Tariff (GETFiT) Program with a total capacity of 10 MWp and a plant factor of 23%. Following the award of a Licence by the Authority, construction started and the company achieved Commercial Operations on 12th December 2016.

In the first quarter of 2017, the plant generated 4.5 GWh and is expected to generate 3.9 GWh in the fourth quarter of 2017 at a cost of Ush 2.0Billion.

**Tororo Solar North (10 MWp)**

The project was procured under the GETFiT program with 10MWp total capacity and a plant factor of 23% but experienced delays in achieving financial close. The project was commissioned in September 2017 and is expected to generate 1.2GWh for which UETCL is expected to incur Ush 0.5 Billion on account of Power Purchase Costs in 2017.

**Import and export of Power**

UETCL exports and imports power from Kenya and Rwanda mainly for tie line flow and not for commercial purposes.

In August 2017, the western part of Kenya's hydrological conditions improved compared to the earlier months of 2017 and as such reduced on the energy support requirement from UETCL. During the same period however, there was increased energy support to Tanzania and as a result, the export by UETCL reduced from 98 GWh registered in the first quarter of 2017 to 75.6 GWh in the third quarter. Accordingly the third quarter 2017 dispatch to Kenya and Tanzania has been used in the determination of the fourth quarter tariffs.

In the third quarter of 2017, the hydrology condition in Western Kenya is expected to improve with more rains expected towards November 2017. As such the exports for the fourth quarter of 2017 are projected to be 75.6 GWh during the period and earn revenue of 35 Billion.

In respect to power import, UETCL is expected to maintain the import levels for tie line flow of 4.0 GWh for both Kenya and Rwanda, at a cost of 2.3 Billion.

The breakdown of the power purchase costs and energy dispatch from the generation sources is shown in Table 16.

**Table 16: Projected Energy Purchases by UETCL**

| Generation Plant | Energy (GWh) | Cost (Ush Bn) | Energy (GWh) | Cost (Ush Bn) |
|---|---|---|---|---|
| | 2017 Base | | Q1 2017 - Q4 2017 forecast | |
| Eskom | 341.0 | 13.6 | 399.1 | 13.9 |
| Bujagali | 380.0 | 142.3 | 425.8 | 143.1 |
| KCCL | 15.8 | 3.3 | 17.1 | 3.55 |
| KML | 5.5 | 0.5 | 6.3 | 0.555 |
| Bugoye-Tronder | 20.2 | 6.4 | 17.3 | 5.5 |
| Mpanga | 19.2 | 5.1 | 5.8 | 1.5 |
| Electro-Max | 15.3 | 10.1 | 31.0 | 20.5 |
| Jacobsen - Namanve | 15.3 | 10.0 | 25.8 | 16.8 |
| Ishasha Ecopower | 7.2 | 1.9 | 3.2 | 0.841 |
| Kakira SW | 58.8 | 20.7 | 27.3 | 9.6 |
| Kinyara | 3.9 | 1.1 | 2.1 | 0.6 |
| Sugar & Allied | 11.0 | 3.9 | 3.3 | 1.2 |
| Tororo Solar | 1.3 | 0.5 | 1.2 | 0.5 |
| Access Solar | 5.0 | 2.0 | 3.9 | 2.0 |
| Muvumbe | 5.8 | 2.0 | 2.5 | 2.0 |
| Nyamwamba | 2.5 | 0.8 | - | 0 |
| Rwimi | 1.5 | 0.5 | - | 0 |
| Waki | 1.7 | 0.6 | - | 0 |
| Siti 1 | 5.0 | 1.8 | 3.2 | 1.8 |
| Buseruka Hydromax | 14.0 | 4.8 | 12.3 | 4.2 |
| Import KPLC -Kenya | 12.1 | 7.7 | 3.1 | 2.0 |
| Import Rwanda | 1.1 | 0.4 | 1.0 | 0.3 |
| **Total** | **942.9** | **240.0** | **991.27** | **230.6** |