



GHANA WHOLESALE ELECTRICITY MARKET BULLETIN

MARKET WATCH

Monthly Market Data Analysis

ISSUE NO. 45

1st October 2019 to 31st October 2019

This Bulletin covers major developments in the Wholesale Electricity Market (WEM) of Ghana from 1st October, 2019 to 31st October, 2019. It analyses the performance of the key WEM indicators against their benchmarks, and examines the likely implications of any discernable trends in the market. This edition of the WEM bulletin presents a publication made on behalf of the CEO of GRIDCo on the Ghana WEM.

The Energy Commission (EC) would very much appreciate and welcome comments from readers on the Bulletin. Reasonable care has been taken to ensure the information contained in this Bulletin is accurate at the time of publication, nevertheless, any errors, omissions or inaccuracies therein are regretted.

HIGHLIGHTS OF THE MONTH

There was an increase in the System Peak Load in October 2019 by 4.4%, from 2,457.3 MW in September 2019 to 2,565.9 MW. Similarly, there a marginal increase of 0.7% in the Ghana Peak Load, from 2,317.1 MW in September 2019 to 2,332.5 MW in October 2019. On the other hand, the System Peak Load recorded for October 2019, was 2.7% lower than the 2,637 MW that was projected in the 2019 Electricity Supply Plan (ESP). Also, the Ghana Peak Load recorded for October 2019 was 5.8% lower than the 2,477 MW projected in the 2019 ESP. Electricity import of 23 MW from CIE contributed to the System Peak Load for October 2019. The total electricity of 261 MW exported to SONABEL and CEB at the System Peak Load was 63.1% higher than the 160 MW projected in the 2019 ESP. Average electricity demand of 1,994.98MW in October 2019 was 1.3% higher than the 1,968.95 MW projected in the 2019 ESP.

The total electricity supplied increased in October 2019, from 1,408.05 GWh in September 2019 to 1,484.27 GWh. Out of the total electricity supplied in October 2019, 11.16 GWh was imported from CIE, and the remaining 1,473.11 GWh was generated from domestic sources. A total of 1,381.67 GWh was consumed domestically in October 2019, which was 4.1% higher than the 1,327.63 GWh that was consumed in September 2019. The total electricity exported to CIE, CEB and SONABEL was 102.6 GWh in October 2019, which was 27.6% higher than the 80.43 GWh supplied in September 2019.

Electricity generated from hydro sources contributed 37.1% of the total electricity supplied in October 2019, which was higher

Table 1. Projected and Actual Outturn of electricity demand and supply in September 2019 and October 2019.

	October 2019		September 2019	
	Projected	Actual Outturn	Projected	Actual Outturn
Total Supply (GWh)	1,464.8	1,482.4	1,387.4	1,408.1
Source by Power Plants (GWh)				
AROSOMBO	377.1	358.7	299.2	373.7
KPONG	67.6	65.2	65.4	61.7
BUI	55.2	126.3	53.4	27.9
Simon Asogli	176.2	245.4	170.4	247.8
TAPCO	144.2	106.6	155.1	72.5
TICO	101.2	202.5	195.8	185.0
TT1PP	54.7	53.9	-	40.4
CENIT	-	25.9	-	-
TT2PP	-	12.6	-	12.1
Amandi	-	24.9	-	9.6
Karpowership	265.7	54.4	248.5	129.9
AMERI	57.0	89.7	59.6	120.0
KTPP	-	18.9	57.3	34.0
Trojan Power	-	-	-	-
CENPOWER	-	18.3	-	3.2
ARSA	161.0	38.4	78.0	42.5
BXC Solar	2.3	-	2.2	1.9
VRA Solar	0.3	0.3	0.2	0.2
Genser	-	27.2	-	26.2
Meinergy	2.3	2.0	2.3	1.9
Total Generation (GWh)	1,464.8	1,471.2	1,387.4	1,390.8
Imports (GWh)	-	11.2	-	17.3
Total Supply (GWh)	1,464.8	1,482.4	1,387.4	1,408.1
Deficit/Over supply (GWh)	-	17.6	-	20.7
Ghana Coincident Peak Load (MW)	2,400.0	2,332.5	2,400.0	2,317.1
System Coincident Peak Load (MW)	2,550.0	2,565.9	2,550.0	2,457.3

HIGHLIGHTS OF THE MONTH

than the 32.91% in September 2019. On the contrary, the share of electricity generated from thermal sources reduced in October 2019, from 65.6% in September 2019 to 61.9%. Again, the share of electricity generated from solar power plants continued to be 0.3% in October 2019.

The rate of increase in the water level for the Akosombo GS increased, while that of Bui GS reduced in October 2019. The rate of increase in the water level for the Akosombo GS increased from 0.15 feet per day in September 2019 to 0.2 feet per day in October 2019. The Bui GS' rate of increase in the water level decreased from 0.73 feet per day in September 2019 to 0.46 feet per day in October 2019.

There was an increase in the consumption of natural gas in October 2019. The share of the total natural gas consumed increased from 82.3% in September 2019 to 87.9% in October 2019. Consequently, the share of the total liquid fuel consumed decreased from 17.7% in September 2019 to 12.1% in October 2019.

ELECTRICITY DEMAND AND SUPPLY

Electricity Demand

The System Peak Load of 2,565.9 MW recorded in October 2019 was 4.4% higher than the 2,457.3 MW recorded in September 2019. Similarly, the Ghana Peak Load of 2,332.5 MW recorded in October 2019 was 0.7% higher than the 2,317.1 MW recorded in September 2019. Electricity import from CIE, contributed 23 MW to the System Peak Load recorded for October 2019. Export of electricity to CEB and SONABEL were recorded at 151 MW and 110 MW respectively in October 2019. The total load supplied from hydro sources contributed 46.1% of the System Peak Load and the remaining 53.9% was supplied from thermal generating sources in October 2019. The average electricity of 1,994.9 MW recorded in October 2019 was 2% higher than the 1,955.6 MW recorded in September 2019. The System Load Factor reduced marginally in October 2019, from 77.9% in September 2019 to 76.1%.

Electricity supply

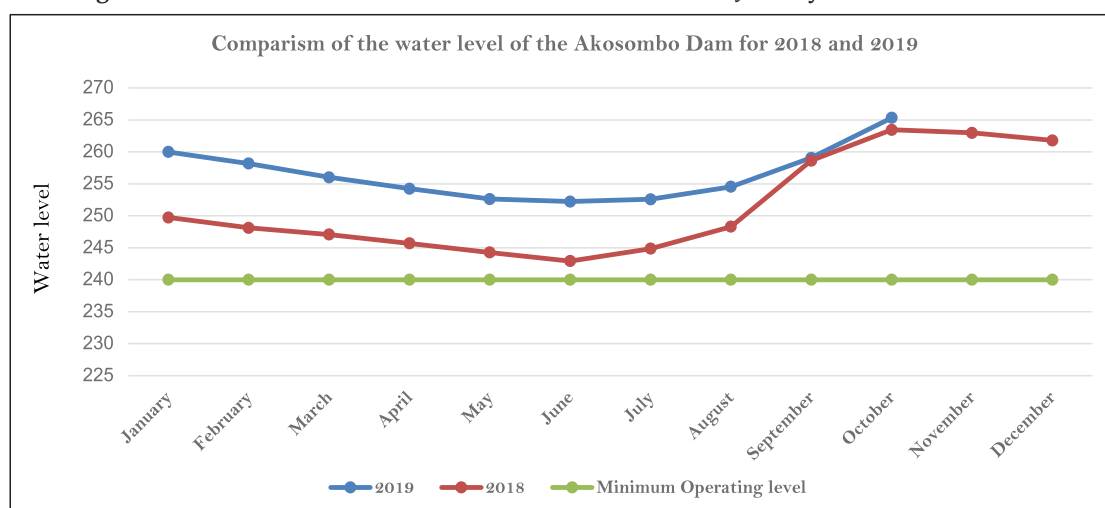
There was a marginal increase in the average electricity supplied in October 2019 by 2%, from 46.94 GWh per in September 2019 to 47.88 GWh per day. Similarly, the total electricity supplied increased by 5.4%, from 1,408.05 GWh in September 2019 to 1,484.27 GWh in October 2019. The total electricity of 1,473.11 GWh generated from domestic sources accounted for 99.3% of the total electricity supplied in October 2019. In October 2019, a total of 11.16 GWh was imported from CIE, which accounted to 0.8%. A total of 102.6 GWh was exported to CIE, CEB and SONABEL in October 2019. Out of the total electricity exported, 2.88 GWh was supplied to CIE, 60.63 GWh to CEB and 39.09 GWh to SONABEL. Electricity generated from hydro sources accounted for 37.1% of the total electricity supplied in October 2019, while thermal generation accounted for the remaining 61.9% in October 2019.

HYDRO DAM LEVELS

Akosombo Dam Water Level continued to increase in October 2019

The rate of increase in the water level for the Akosombo GS increased by 34.4%, from 0.15 feet per day in September 2019 to 0.2 feet per in October 2019. The water level for the Akosombo dam increased by 6.28 feet in October 2019, from 259.07 feet at the beginning of the month to 265.35 feet at the end of the month. The water level recorded at the end of the month was 1.89 feet above the water level recorded for the same period in 2018. Again, the water level recorded at the end of the month was 12.35 feet below the maximum operating water level of the dam.

Figure 1: Month-End Water Level for Akosombo Dam from January 2018 to October 2019



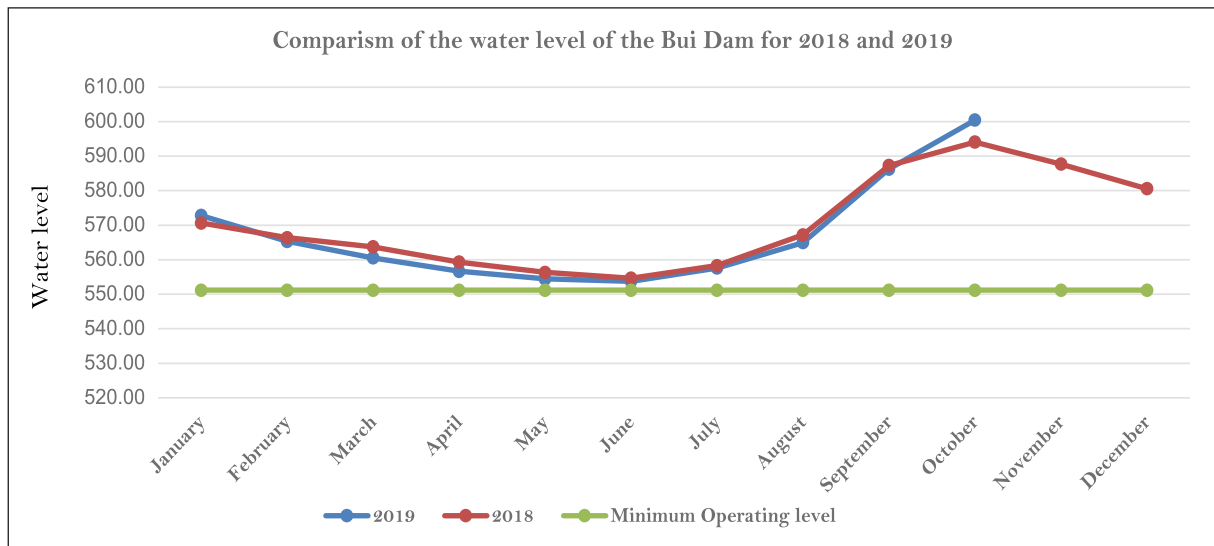
HIGHLIGHTS OF THE MONTH

Bui Dam Water Level continued to increase in October 2019

The water level for the Bui Dam continued to increase but at a reduced rate due to the controlled spillage on 23rd October 2019. The rate of increase in the water level reduced by 37%, from 0.72 feet by day in September 2019 to 0.46 feet per day in October 2019. The water level of 586.28 feet recorded at the beginning of the month reduced by 14.21 feet to a month end water level of 600.48 feet. The water level recorded at the end of the month was 6.39 feet above the water level recorded for the same period in 2018. Also, the water level recorded at the month end was 0.09 feet above the maximum operating level of the dam.

Figure 2 shows comparative end of month trajectory of the level of water in the Bui dam from January 2018 to October 2019.

Figure 2: Month-End Water Level for Bui Dam from January 2018 to October 2019



FUEL SUPPLY FOR POWER GENERATION

Natural gas flow rate from WAGPCo increased in October 2019

The flow rate of natural gas from WAGPCo to the Tema and Kpone power enclave increased from 53.33 MMSCFD in September 2019 to 57.91 MMSCFD in October 2019. Also, the total natural gas supplied by WAGPCo increased from 1,599.76 in September 2019 to 1,795.21 MMSCF in October 2019. The total natural gas supplied by WAGPCo constituted 27.2% of the total natural gas consumed in October 2019, which was marginally higher than the 24.8% it recorded in September 2019. In the total fuel mix, the share of natural gas supplied by WAGPCo increased from 20.4% in September 2019 to 24% in October 2019.

Natural gas flow from GNGC decreased in October 2019.

The natural gas flow rate from the Atuabo Gas Processing Plant to the Aboadze Power Enclave decreased in October 2019, from 54.4 MMSCFD in September 2019 to 47.3 MMSCFD. Similarly, the total natural gas supplied decreased from 1,632.13 MMSCF in September 2019 to 1,466.33 MMSCF in October 2019. Also, a total of 319 MMSCF was supplied to Genser for electricity generation for October 2019. This was marginally higher than the 305.62 MMSCF supplied in September 2019. In summary, the total natural gas supplied by GNGC was 1,785.62 MMSCF in October 2019, which was lower than the 1,937.75 MMSCF in September 2019. The total natural gas supplied by GNGC constituted 26.1% of the total natural gas consumed in October 2019 which was lower than the 28.2% recorded in September 2019. In the total fuel mix, the total natural gas supplied by GNGC constituted 22.9% in October 2019, which was lower than the 23.2% recorded in September 2019.

Natural gas flow from ENI/GNPC increased in October 2019

There was a marginal reduction in the natural gas supplied by ENI/GNPC to the Aboadze, Tema and Kpone Power Enclaves by 1.3% in October 2019. The reduced natural gas flow rate was from 102.63 MMSCFD in September 2019 to 101.29 MMSCFD in October 2019. A total of 1,722.04 MMSCF of natural gas was supplied to the Aboadze Power Enclave in October 2019 which was marginally lower than the 1,792.25 MMSCF supplied in September 2019. On the contrary, the total natural gas supplied by ENI/GNPC through the reverse flow facility increased in October 2019, from 1,286.65 MMSCF in September 2019 to 1,417.88 MMSCF. In summary, a total of 3,139.92 MMSCF was supplied in October 2019 which was higher than the 2,927.64 MMSCF in September 2019. This was due to greater number of days in October than in September. The total natural gas supplied by ENI/GNPC constituted 46.7% of the total natural gas consumed in October 2019 which was marginally lower than the 47% recorded in September 2019. In the total fuel mix, the share of natural gas supplied by ENI/GNPC increased from 38.7% in September 2019 to 41% in October 2019.

Liquid Fuel

The consumption of liquid fuel continued to reduce due in October 2019, from 280,735 barrels in August 2019, 246,871 barrels in September 2019 to 165,695 barrels. This has been due to the reduced generation of Karpowership and AKSA power plant during the period. Consequently, the share of the total HFO consumed in the total liquid fuel reduced from 94% in September 2019 to 77.5% in October 2019. Similarly, the share of HFO consumed in the total fuel mix reduced from 16.7% in September 2019 to 9.4% in October 2019. The share of the total DFO consumed in the total liquid fuel consumed stood at 0.6% and 0.1% in the total fuel mix in October 2019. On the contrary, the share of LCO increased from 5.4% in September 2019 to 21.9% in October 2019 in the total liquid fuel and 1% in September 2019 to 2.6% in October 2019 in the total fuel mix. The consumption of the LCO and DFO was due to the commissioning of the Amandi power plant.

Plant by Plant Highlights

Electricity Generation at the Akosombo Generation Station (GS) decreased in October 2019

The average electricity generated by the Akosombo GS decreased by 7.1% in October 2019, from 12.46 GWh per day in September 2019 to 11.57 GWh per day. Similarly, the total electricity supplied by the hydro power plant decreased by 4%, from 373.7 GWh in September 2019 to 358.65 GWh in October 2019. The total electricity generated by the Akosombo GS was 4.9% lower than the 377.1 GWh projected in the 2019 ESP. Also, the total electricity generated by the Akosombo GS constituted 24.2% of the total electricity supplied in October 2019. The hydro power plant contributed 641.6 MW and 671.1 MW to the System Peak Load and the Ghana Peak Load respectively in October 2019. This represents 25% of the System Peak Load and 26.8% of the Ghana Peak Load in October 2019.

Electricity supply by Kpong Generation Station (GS) increased in October 2019

The average electricity generated by the Kpong GS increased marginally by 2.2%, from 2.06 GWh per day in September 2019 to 2.1 GWh per day in October 2019. Similarly, the total electricity supplied by the Kpong GS increased by 5.6%, from 61.7 GWh in September 2019 to 65.17 GWh in October 2019. The total electricity generated by the hydro power plant constituted 4.4% of the total electricity supplied in October 2019 and was 3.6% lower than the 67.6 GWh projected in the 2019 ESP. The hydro power plant contributed 111 MW to the System Peak Load and 109 MW to the Ghana Peak Load, representing 4.3% and 4.4% of the peak loads respectively in October 2019.

Electricity supply by the Bui Generation Station (GS) increased in October 2019

There was a significant increase of about 3.4 folds in the average electricity supplied by the Bui GS, from 0.93 GWh per day in September 2019 to 4.07 GWh per day in October 2019. As a result, the electricity supplied by the Bui GS increased significantly by 3.5 folds, from 27.95 GWh in September 2019 to 126.3 GWh in October 2019. The significant increase in the electricity generated by the power plant was due to a momentous inflow into the dam to prevent spillage. The total electricity generated by the hydro power plant constituted 8.5% of the total electricity supplied in October 2019 and was about 1.3 folds more than the 55.2 GWh projected in the 2019 ESP. The Bui GS contributed 391 MW to the System Peak Load and 264 GWh to the Ghana Peak Load, representing 15.2% of the System Peak Load and 10.6% of the Ghana Peak Load in October 2019.

Generation by the Sunon Asogli Power Plant (SAPP) decreased in October 2019

The Sunon Asogli Power Plant (SAPP) recorded a reduction in the average electricity generated in October 2019 by 4.2%, from 8.26 GWh per day 2019 to 7.92 GWh per day. Similarly, the total electricity supplied by SAPP reduced marginally by 1%, from 247.76 GWh in September 2019 to 245.39 GWh in October 2019. The total electricity generated by the thermal power plant constituted 16.5% of the total electricity supplied in October 2019 and was 39.3% more than the 176.2 GWh projected in the 2019 ESP. The thermal power plant contributed 342.7 MW to the System Peak Load and the Ghana Peak Load, representing 13.4% of the System Peak Load and 13.7% of the Ghana Peak Load in October 2019. The thermal power plant consumed a total of 1,822.71 MMSCF of natural gas at an estimated heat rate of 7,928.99 Btu/kWh in October 2019 which was lower than the 8,023.57 Btu/kWh in September 2019.

Ameri Energy Power Plant's generation decreased in October 2019

The average electricity generated by the Ameri Power Plant reduced by 27.6%, from 4 GWh per day in September 2019 to 2.89 GWh per day in October 2019. Similarly, the total electricity generated by the thermal power plant decreased by 25.2%, from 119.96 GWh in September 2019 to 89.73 GWh in October 2019. The total electricity supplied by the thermal power plant constituted 6.1% of the total electricity supplied in October 2019 and was 57.4% more than the 57 GWh projected in the 2019 ESP. The Ameri thermal power plant contributed 48.1 MW to the System Peak Load and 168.2 MW to the Ghana Peak Load in October 2019. These represent 1.9% of the System Peak Load and 6.7% of the Ghana Peak Load in October 2019. The thermal power plant consumed a total of 882.12 MMSCF of natural gas at an estimated heat rate of 10,116.2 Btu/kWh in October 2019 which was lower than the 10,228.32 Btu/kWh in September 2019.

The Karpowership Power Plant's continued operation in October 2019.

The Karpowership after its relocation operated on HFO while waiting for the supply of natural gas to the power ship. The operations of the thermal power plant was limited to 18 days to enable the completion of the connection of the power ship to the natural gas supply sources. A total of 54.43 GWh was generated by Karpowership in October 2019. This constituted 3.7% of the total electricity supplied in October 2019. The thermal power plant consumed a total of 72,609.99 barrels of HFO at an estimated heat rate of 8,071.26 Btu/kWh in October 2019. The Karpowership did not contribute to both the System Peak Load and the Ghana Peak Load in October 2019.

AKSA Power Plant's generation decreased in October 2019

There was a reduction in the average electricity generated by the AKSA power plant in October 2019 by 5.7%, from 1.42 GWh per day in September 2019 to 1.24 GWh per day. Similarly, the total electricity generated by the thermal power plant decreased from 42.51 GWh in September 2019 to 38.4 GWh in October 2019. The total electricity supplied by the thermal power plant constituted 2.6% of the total electricity supplied in October 2019 and was 76.2% lower than the 161 GWh projected in the 2019 ESP. The AKSA thermal power plant contributed 99.6 MW to the System Peak Load and 254.5 MW to the Ghana Peak Load, representing

HIGHLIGHTS OF THE MONTH

3.9% and 10.2% of the respective peak loads in October 2019. AKSA consumed a total of 51,831.95 barrels of HFO at an estimated heat rate of 8,166.89 Btu/kWh in October 2019 which was lower than the 8,182.32 Btu/kWh recorded in September 2019.

Takoradi International Company (TICO) generation increased in October 2019

The average electricity generated by the TICO power plant increased significantly by 70.2% in August 2019, from 4.03 GWh per day in July 2019 to 6.86 GWh per day. Similarly, the total electricity supplied by the TICO power plant increased from 125.02 GWh in July 2019 to 212.8 GWh in August 2019. The total electricity supplied by the thermal power plant constituted 14.9% of the total electricity supplied in August 2019 and was 5.1% higher than the 202.4 GWh in August 2019. The thermal power plant generated 358 MW and 359 MW to the System Peak Load and the Ghana Peak Load, representing 14.3% and 15.2% of the peak loads respectively. TICO consumed a total of 1,684.55 MMSCF of natural gas at an estimated heat rate of 8,145.88 Btu/kWh in August 2019, which marginally higher than the 8,133.41 Btu/kWh it recorded in July 2019.

Takoradi Power Company (TAPCO) Plant's generation increased in October 2019

There was a significant increase in the average electricity generated by the TAPCO power plant by 42.3%, from 2.42 GWh per day in September 2019 to 47.02 GWh per day in October 2019. Similarly, the total electricity generated by the thermal power plant increased by 47%, from 72.53 GWh in September 2019 to 106.64 GWh in October 2019. The total electricity generated by the thermal power plant constituted 7.2% of the total electricity supplied in October 2019 and was 26.1% lower than the 144.2 GWh projected in the 2019 ESP. TAPCO generated 156 MW to both the System Peak Load and the Ghana Peak Load, representing 6% of both peak loads. The thermal power plant consumed a total of 781.95 MMSCF of natural gas at an estimated heat rate of 7,545.58 Btu/kWh in October 2019 which was lower than the 9,761.99 Btu/kWh in September 2019.

Kpone Thermal Power Plant (KTPP) generation decreased in October 2019

KTPP's operations was limited to 9 days in October 2019. The thermal power plant generated a total of 18.86 GWh in October 2019 which constituted 1.3% of the total electricity supplied in October 2019. The thermal power plant did not contribute to the System Peak Load but supplied 105 MW to during the Ghana Peak Load for October 2019. A total of 211,027.38 MMSCF of natural was consumed by the thermal power plant at an estimated heat rate of 11,186.84 Btu/kWh in October 2019.

Tema Thermal 1 Power Plant (TT1PP) generation increased in October 2019

The average electricity supplied by the thermal power plant increased by 29%, from 1.35 GWh per day in September 2019 to 1.74 GWh per day in October 2019. The total electricity supplied by the thermal power plant increased from 40.42 GWh in September 2019 to 53.9 GWh in October 2019. The total electricity supplied by TT1PP constituted 3.6% of the total electricity supplied in October 2019 and was 1.5% lower than the 54.7 GWh projected in the 2019 ESP. TT1PP contributed 104 MW to the System Peak Load and the Ghana Peak Load in October 2019, which represented 4.1% of the System Peak Load and 4.2% of the Ghana Peak Load in October 2019. The thermal power plant consumed a total of 605.33 MMSCF of natural gas at an estimated heat rate of 11,988.26 Btu/kWh in October 2019.

Embedded Electricity Generation

Genser Power Plant's generation increased in October 2019

Genser recorded a marginal increase in the average electricity supplied in October 2019, from 0.87 GWh per day in September 2019 to 0.88 GWh per day in October 2019. Also, the total electricity supplied by the thermal power plant increased from 26.24 GWh in September 2019 to 27.18 GWh in October 2019. A total of 319.29 MMSCF of natural gas was consumed by the thermal power plant at an estimated heat rate of 12,088.01 Btu/kWh in October 2019 which was higher than the 11,984.91 Btu/kWh in September 2019.

BXC Solar generation remained the same in October 2019

The BXC Solar power plant generation remained unchanged for October 2019. The total electricity of 1.95 GWh supplied in October 2019 constituted 0.1% of the total electricity supplied in October 2019 but was 17.4% lower than the 2.3 GWh projected in the 2019 ESP.

Meinergy Solar generation increased in October 2019

The Meinergy Solar power plant's generation increased from 1.91 GWh in September 2019 to 2.04 GWh in October. The generation from the solar power plant was lower than projected in the 2019 ESP by 11.5% and constituted 0.1% of the total electricity supplied in October 2019.

Electricity Exchange – Import decreased whilst Export increased in October 2019

There was a reduction in the average electricity imported from CIE by 37.5%, from 0.58 GWh per day in September 2019 to 0.36 GWh per day in October 2019. Similarly, the total electricity imported from CIE was 35.4% lower in October 2019, from 17.28 GWh in September 2019 to 11.16 GWh in October 2019. The total electricity imported from CIE constituted 0.8% of the total electricity supplied in October 2019.

The total average electricity exported to CIE, CEB and SONABEL increased by 23.5%, from 2.68 GWh per day in September 2019 to 3.31 GWh per day in October 2019. The average electricity exported to CIE, CEB and SONABEL increased from 0.07 GWh per day, 1.38 GWh per day and 1.23 GWh per day in September 2019 to 0.09 GWh per day, 1.96 GWh per day and 1.26 GWh per day in October 2019 respectively.

As a result of an increase in the average electricity exported, there was 27.6% increase in the total electricity exported to CIE, CEB and SONABEL, from 80.43 GWh in September 2019 to 102.6 GWh in October 2019. Out of the total electricity exported, 2.88 GWh, 60.63 GWh and 39.09 GWh were supplied to CIE, CEB and SONABEL respectively in October 2019. These figures were however higher than the 2.22 GWh, 41.4 GWh and 36.81 GWh exported to CIE, CEB and SONABEL in September 2019 respectively.

Ghana continued to be a net exporter of electricity in October 2019.

OPERATIONAL FACT SHEET

Monthly Market Data Analysis

Figure 3a: Shares of sources of fuel in total fuel mix for power generation Figure 3b: Shares of fuel type in the generation fuel mix power generation

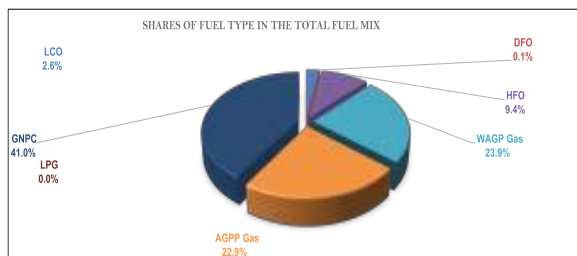
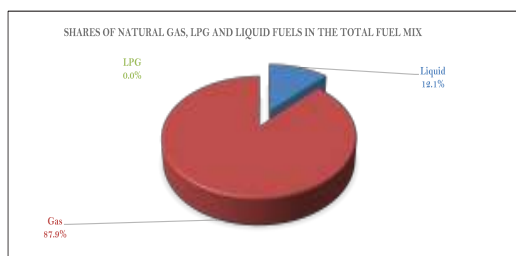


Figure 4a: Contribution of Natural Gas Supply by sources

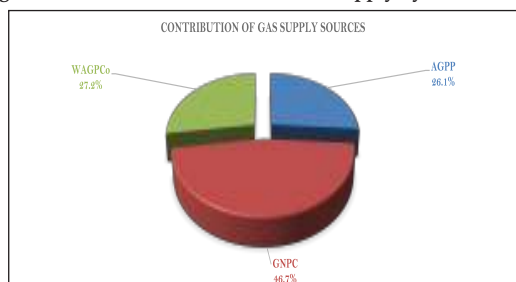
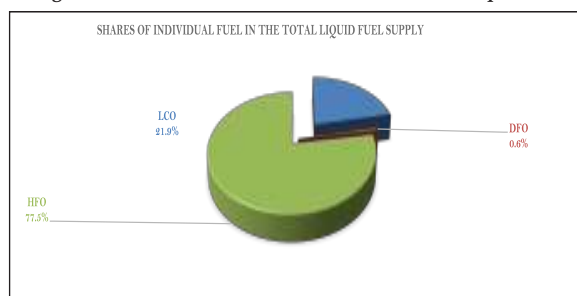


Figure 4b: Contribution of individual fuel in the liquid fuel supply

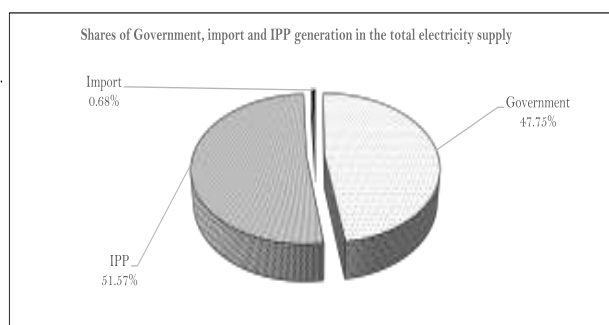
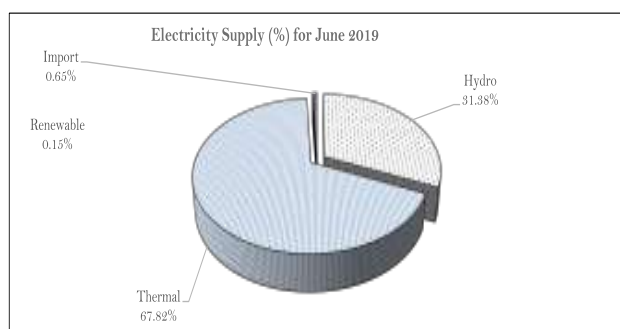


Peak Electricity Supply - October 2019			
Source of Supply	Generation at System Peak Load (MW)	Generation at Ghana Peak Load (MW)	Electricity Supply (GWh)
AKOSOMBO	641.60	671.10	358.65
KPONG	111.00	109.00	65.17
BUI	391.00	264.00	126.30
SEAP	342.70	342.70	245.39
TAPCO	156.00	156.00	106.64
TICO	331.00	292.00	202.47
TT1PP	104.00	104.00	53.90
CENIT	110.00	109.00	25.86
TT2PP	7.00	7.00	12.62
AMANDI	200.90	-	24.94
KARPOWER	-	-	54.43
AMERI	48.10	168.20	89.73
KTPP	-	-	18.86
Trojan Power	-	-	-
CENPOWER	-	-	18.35
AKSA	99.60	254.50	38.40
BXC Solar	-	-	1.90
Safisana	-	-	-
VRA Solar	-	-	0.29
Genser	23.00	-	27.18
IMPORT	23.00	23.00	11.16
Export to CIE at peak	-	-	60.63
Export to CEB at peak	151.00	96.00	2.88
Export to Sonabel	110.00	72.00	39.09
System Coincident Peak Load	2,565.90		
Ghana Coincident Peak Load		2,332.50	
Total Supply			1,482.23
Total Supply without export			1,379.63

OPERATIONAL FACT SHEET

Average Monthly Flowrate (MMSCFD)	
Location	Monthly Average
Etoki	84.37
Tema WAGPCo	102.11
Aboadze WAGPCo	0.00
Aboadze GNGC	112.47
Reverse Flow	44.61

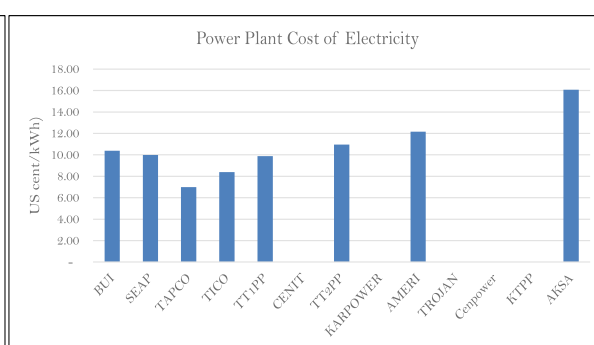
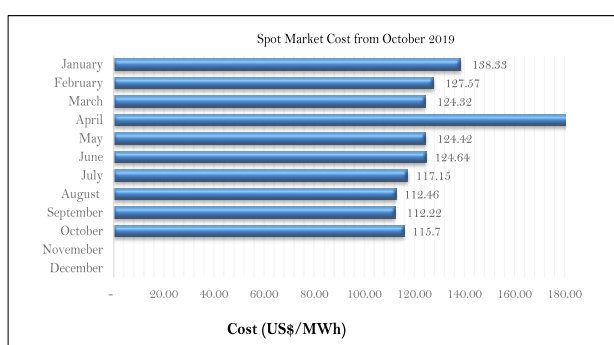
Oct-19			
	Beginning month (ft)	End month (ft)	Change in water level (feet)
Hydro Dam			
Akosombo	259.07	265.35	6.28
Bui	586.28	600.48	14.21



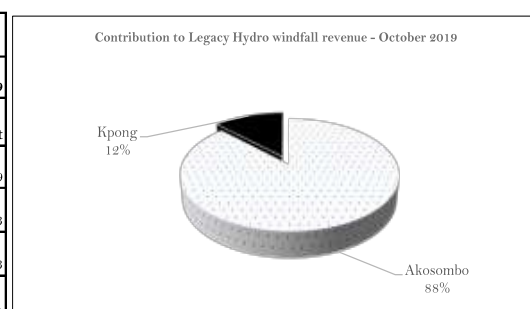
Power Plant Data October 2019								
	Installed Capacity (MW)	Plant Capacity Utilization (%)	Electricity Generation (GWh)	Gas Consumption (MMBtu)	LCO Consumption (MMBtu)	DFO Consumption (MMBtu)	HFO Consumption (MMBtu)	LPG Consumption (MMBtu)
Akosombo	1,020.00	48.84	358.65	-	-	-	-	-
Kpong	160.00	56.57	65.17	-	-	-	-	-
Bui	400.00	43.85	126.30	-	-	-	-	-
SEAP	560.00	60.86	245.39	1,945,672.71	-	-	-	-
TAPCO	330.00	44.88	106.64	804,622.90	-	-	-	-
TICO	340.00	82.71	202.47	1,568,512.20	-	-	-	-
TT1PP	126.00	59.41	53.90	646,167.38	-	-	-	-
CENT	126.00	28.51	25.86	272,897.78	-	-	-	-
TT2PP	87.00	20.15	12.62	162,896.10	-	-	-	-
KARPOWER	470.00	16.08	54.43	-	-	-	439,290.46	-
AMERI	250.00	49.85	89.73	907,696.61	-	-	-	-
Cenpower	370.00	6.89	18.35	191,186.17	-	151.70	-	-
TROJAN	56.00	-	-	-	-	-	-	-
KTPP	220.00	11.91	18.86	211,027.38	-	-	-	-
AKSA	360.00	14.81	38.40	-	-	-	313,583.30	-
GENSER	95.00	39.74	27.18	-	-	-	-	-
VRA Solar	2.50	16.17	0.29	-	-	-	-	-
BXC	20.00	13.19	1.90	-	-	-	-	-
Meinergy	20.00	14.14	2.04	-	-	-	-	-
Total	5,012.50	40.13	1,448.17	6,710,679.23	-	151.70	752,873.76	-

ECONOMIC FACT SHEET

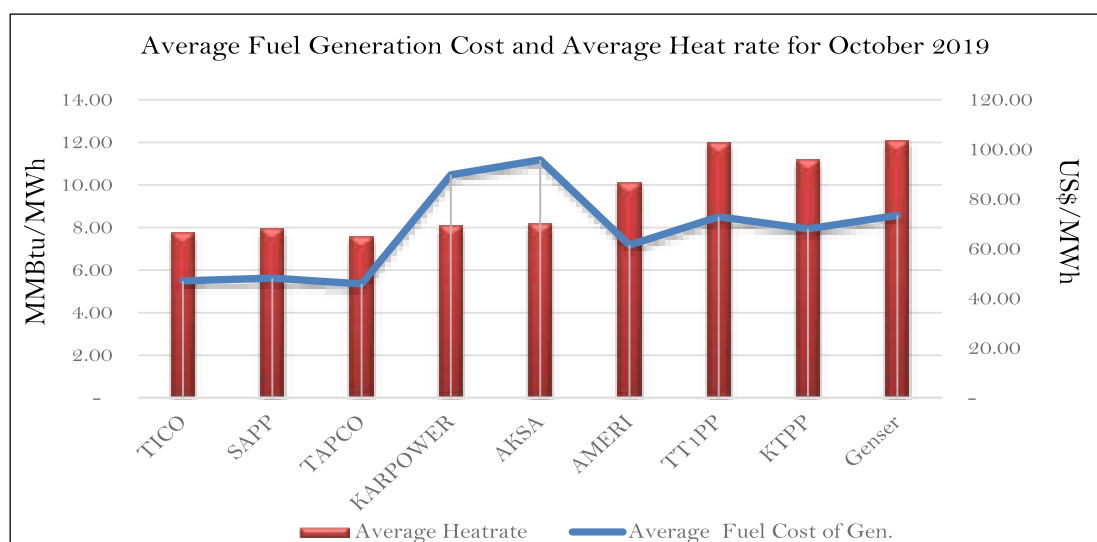
		Actual	Projected	Change
Average Market Energy Cost	US\$/MWh	77.58	84.15	(6.57)
Average Market Capacity Charge (AMCC)	US\$/MWh	32.53	34.73	(2.20)
Total Average Market Cost (TAC)	US\$/MWh	110.11	118.88	(8.77)
System Marginal Cost (SMC)	US\$/MWh	115.70	88.55	27.15
System Marginal Capacity Charge (SMCC)	US\$/MWh	23.95	23.42	0.53
Spot Market Price (SMP)	US\$/MWh	139.65	111.97	27.68
Composite Bulk Generation Charge (CBGC)	US\$/MWh	97.01	97.01	-
Deviation of TAC from CBGC	US\$/MWh	(13.10)	(21.87)	8.77
Deviation of SMP from CBGC	US\$/MWh	(42.64)	(14.96)	(27.68)



Average Fuel Prices		
		Oct-19
Fuel Type	Unit	Delivered Cost
Natural Gas	US\$/MMBtu	7.29
LCO	US\$/BBL	64.13
HFO	US\$/Tonne	389.03
DFO	US\$/Tonne	0.00



	Gazetted Natural Gas Price	Weighted average Natural Gas Price	LCO	HFO	DFO
US\$/MMBTu	6.08	6.00	12.12	11.38	0.00



ECONOMIC FACT SHEET

Power Plant	Capacity Utilization (%)	Average Heat rate (Btu/KWh)	Average Fuel Cost of Generation (US\$/MWh)	Emission Factor (kgCO ₂ /kWh)
Akosombo	48.84	-	-	-
Kpong	56.57	-	-	-
Bui	43.85	-	-	-
SAPP	60.86	7,928.99	48.21	0.42
TAPCO	44.88	7,545.58	45.88	0.40
TICO	82.71	7,747.04	47.10	0.41
TT1PP	59.41	11,988.26	72.89	0.64
CENIT	28.51	10,552.97	-	0.56
TT2PP	20.15	12,905.83	78.47	0.68
KARPOWER	16.08	8,071.26	89.78	0.64
AMERI	49.85	10,116.20	61.51	0.54
TROJAN	-	-	-	-
KTPP	11.91	11,186.84	68.02	-
AKSA	14.81	8,166.89	95.80	0.64
Genser	39.74	12,088.01	73.50	0.64

		Wholesale Electricity Market Price Data - 2019 (Uscent/kWh)									
		January	February	March	April	May	June	July	August	September	October
Average Market Price	Actual	14.14	14.26	13.87	16.68	13.91	13.55	11.91	11.28	11.60	11.01
	Projected	12.79	12.69	12.74	12.97	12.86	12.70	12.74	11.54	11.44	11.89
System Marginal Price	Actual	17.02	16.07	14.77	20.85	14.84	14.86	14.11	13.64	13.62	13.97
	Projected	12.83	13.00	12.83	12.88	12.83	12.88	12.83	11.20	11.25	11.20

GHANA TO LAUNCH WHOLESALE ELECTRICITY MARKET - GRIDCO

Mr Jonathan Amoako-Baah, Chief Executive Officer of Ghana Grid Company Limited (GRDCo), has said that Ghana will be launching the first ever wholesale electricity market in Africa next year.

He said this while speaking at the opening ceremony of the 2019 AFRICON hosted by the Institute of Electrical and Electronics Engineers (IEEE), the world's largest professional association dedicated to advancing engineering and technology for the benefit of humanity on Wednesday, 25 September 2019 at the Ghana Institute of Management and Public Administration (GIMPA).

The Ghana section of IEEE is hosting this year's 3-day conference on the theme: Powering Africa's Sustainable Energy for All Agenda: The Role of ICT and Engineering.

He said : ...I am therefore extremely interested in seeing Ghana and all other African states take action to protect the future our children will live in. If we do not take action, the ensuing catastrophe will have untold costs and burdens on their generation. That said I also want to protect them from unnecessary financial burden. Hence a more gradual transition to bridging this gap - allowing economies to catch up might be a better answer.

"Ghana today has dovetailed this goal by taking a herculean step to launch the first ever Wholesale Electricity Market in Africa by the year 2022. As always Ghana is known to be the pace setter for major paradigm shifts, such as being the first sub-Saharan African country to gain independence from European colonization in 1957, and thereby spurring other African countries to do same.

"The introduction of a wholesale electricity market moves the commodity away from bilateral trades and allows for electricity prices to be determined by market forces rather than fixed levelised costs and marginal pricing. The ultimate aim of this endeavour is to improve the socio-economic status of citizenry by providing affordable, reliable, sustainable and clean sources of energy.

"Wholesale competition will also induce efficiency gains in the power industry, and this will trickle down excellent customer service. Ghana like many developing countries has a major problem which is the cross subsidisation of electricity prices to address a broader economic, political and social conditions of the country."

Source: Laudbusiness.com/Ghana, September 28, 2019.

GHANA'S NATIONAL ELECTRIFICATION RATE IS 85% - GRIDCO BOSS



Mr, Jonathan Amoako-Baah, Chief Executive Officer (CEO) of Ghana Grid Company Limited (GRIDCo), has said that Ghana has about 85 per cent electricity coverage as of 2019.

According to him, although the 85 percentage rate is below the target, the rate is commendable.

Other Market News and Trends

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The Ghana section of IEEE is hosting this year's 3-day conference on the theme: Powering Africa's Sustainable Energy for All Agenda: The Role of ICT and Engineering.

He said : "In 1989 Ghana instituted a National Electrification Scheme (NES) with the aim of providing universal access by 2020. Currently Ghana's electrification rate is about 85%, and although a bit far off the target, it is still commendable considering that we were way below the fiftieth percentile before the scheme began. The scheme has brought electricity to most citizenry and improved their socio-economic status.

"There is a close linkage between the realisation of a Wholesale Electricity Market in Ghana and rural electrification. This is because if Rural Electrification is well addressed governments will feel more comfortable approving the roll - out of the Wholesale Electricity Market.

"I believe that to make the Rural Electrification Scheme strong it has to be set - up into an agency to provide and operate in areas classified as vulnerable and rural. Rural electrification should be addressed separately, by providing sustainable electricity solutions that is subsidised for rural folks.

"The exploitation of this endeavour has other secondary benefits such as curbing rural-urban migration, enhancing supply security, providing local solutions and providing job opportunities."

He added : "When I started my practice in 1985 the largest companies in the world were energy-based such as Exxon Mobil, General Electronic, Royal Dutch Shell, British Petroleum and Gazprom. However, in today's world the top five (5) companies are Microsoft, Apple, Amazon, Google and Facebook which are all ICT-based. What does this tell us?

"This is not to say that the need for electricity has reduced or is diminishing, but rather more investment is going into ICT to help holistically address the challenges the world faces today.

"These include energy, food, water and shelter. You will find that in most of our workplaces ICT is increasingly being inculcated into our routine activities. Now let me ask, who in this room doesn't use a computer in their daily work? or better still let me ask how many of you still use windows 98, vista or even windows 7?

"I bet most of you are using windows 10 now. As for the smart phones, tablets and the internet, the connectivity it has brought to the world cannot be over-estimated. We sit comfortably in our offices today and have conference calls across continents with applications like skype, slack and whatsapp.

"The result is that discussions and solutions that could take days to reach are achieved in an hour. True Wealth as they say is in Innovation."

Participants from over 16 countries - Finland, Sweden, Senegal, Slovakia Togo, United States, Germany, Ghana, Botswana, Ethiopia, Lesotho, Malaysia, Netherlands, Nigeria, Benin, and South Africa - are attending the conference.

For his part, the Managing Director of the Electricity Company of Ghana (ECG), Mr Samuel Boakye-Appiah, said private investors have an important role to play in the energy sector in Africa and around the world in order to help the government to constantly supply power for domestic and commercial use.

He said: "Over the past 50 years, ECG has provided quality, safe and reliable electricity distribution services to support the economic growth and development of Ghana. Currently, with over 85% electricity access rate in Ghana, ECG and her sister utilities Volta River Authority, GRIDCo and NEDCo can be proud of our collective achievements. Unfortunately, the same cannot be said of the electricity penetration rate in sub-Saharan Africa".

"According to a recent Africa Energy Outlook report published by International Energy Agency, 'More than 620 million people live without access to electricity in Africa and those who do have access to modern energy face very high prices for a supply that is both insufficient and unreliable'.

"The same report adds that, 'Overall, the energy sector of sub-Saharan Africa is not yet able to meet the needs and aspirations of its citizens'."

Mr Boakye-Appiah added: "Africa is rising, yes, but Africa can only rise higher and faster on the back of sustainable energy as succinctly and eloquently captured by the theme for this conference. For sustainability in the energy sector to be sustainable, it must satisfy the following components; political acceptability, economic development, social equity and environment protection and affordability.

Other Market News and Trends

“Ensuring sustainability in the energy value chain requires huge capital investments to drive scientific research and technological innovations. With most African governments confronted with competing demands, infrastructure projects and social intervention programmes, they are constrained. Therefore, the onus of providing the needed capital investments for the development of sustainable energy resources to power Africa’s development is in the hands of the private sector”, he noted.

Source: Laudbusiness.com/Ghana

Acronyms

AGPP = Atuabu Gas Processing Plant

CBGC = Composite Bulk Generation Charge

DFO = Distillate Fuel Oil

ECG = Electricity Company of Ghana

ESP = Electricity Supply Plan

GHp = Ghana Pesewa

GWh = Giga-watt Hours

KTPP = Kpone Thermal Power Plant

MRP = Mine Reserve Plant

LCO = Light Crude Oil

LTA = Long Term Average

MMscf = Million Standard Cubic Feet

NITS = National Interconnected Transmission System

SAPP = Sunon Asogli Power Plant

SNEP = Strategic National Energy Plan

TT2PP = Tema Thermal 2 Power Plant

VRA = Volta River Authority

WAGP = West African Gas Pipeline

Btu = British Thermal Units

CUF = Capacity Utilization Factor

EC = Energy Commission

EMOP = Electricity Market Oversight Panel

FPSO = Floating Production, Storage and Offloading

GNGC = Ghana National Gas Company

HFO = Heavy Fuel Oil

kWh = Kilo-watt hours

LEAP = Long-range Energy Alternative Planning

LI = Legislative Instrument

MW = Megawatt

MWh = Mega-watt hours

PV = Photovoltaic

SMP = System Marginal Price

TEN = Tweneboa, Enyenra, Ntomme

TT2PP = Tema Thermal 2 Power Plant

WAGPCo = West African Gas Pipeline Company

WEM = Wholesale Electricity Market

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