



GHANA WHOLESALE ELECTRICITY MARKET BULLETIN

MARKET WATCH

Monthly Market Data Analysis

ISSUE NO. 83

1st March 2023 to 31st March 2023

This Bulletin highlights significant changes in Ghana's Wholesale Electricity Market (WEM) from March 1st 2023 to March 31st 2023. It compares the performance of the important WEM indicators to their benchmarks and analyzes the potential effects of any market trends that can be seen.

Although this Bulletin's content has been checked for accuracy at the time of publishing with reasonable care, any mistakes, omissions, or inaccuracies are regrettable. Reader feedback on the Bulletin would be very appreciated and welcomed by the Electricity Market Oversight Panel Secretariat (EMOPS).

HIGHLIGHTS OF THE MONTH

In March 2023, the System Peak Load was 3,513.86MW which was lower than the 3,609MW forecasted in the 2023 Electricity Supply Plan (ESP). The System Peak load made up of 3,231.86MW of the domestic demand and 282MW of the Export demand. The Ghana peak load which is Ghana's System demand (excluding export) for March, 2023 was 3,231.86MW which was lower than the 3,259MW projected in the 2023 electricity supply plan (ESP).

The electricity supply averaged 67.02GWh per day in March, 2023. This value was marginally higher than the 66.25GWh per day projected in the 2023 ESP. A total of 2,070.45GWh of electricity was supplied in March, 2023 and was 1.2% higher than the 2,053.8GWh projected in the 2023 ESP. Electricity export for the month totaled 189.63GWh and this was lower than 190.2GWh projected in the Electricity Supply Plan.

The regulated market accounted for 79.6% of electricity purchased in the Ghana wholesale electricity market in March, 2023. The De-regulated market accounted for 6.8% in March, 2023 while the export market accounted for the rest.

The Akosombo Dam water level continued its decrease from January 2023 through to March 2023. The water level at the beginning of March, 2023 was 269.58feet, which declined to 268.24 feet at the end of the month at a rate of 0.04feet per day in March, 2023

Bui dam water level for March, 2023 reduced by 8.73feet from the 573.36 at the beginning of the month to 564.63 feet. The water level

Table 1. Projected and Actual Outturn of Electricity Demand and Supply in February 2023 and March 2023.

	Feb-23		Mar-23	
	Projected	Actual	Projected	Actual
Total Supply (GWh)	1,856.0	1,894.4	2,053.80	2,077.7
Source by Power Plants (GWh)				
AKOSOMBO	424.4	505.9	500	548.0
KPONG	76.0	83.2	89.5	93.8
BUI	96.4	145.8	98.3	148.7
BUI Solar	12.0	6.4	11.9	7.5
Kaleo	1.5	1.3	1.6	3.0
Sunon Asogli	288.7	231.1	375	261.3
TAPCO	193.5	191.4	214.3	165.3
TICO	192.5	176.3	222.6	248.9
TT1PP	-	57.8	-	6.6
CENT	32.8	32.4	12.6	19.4
TT2PP	6.3	3.5	6.3	6.0
Twin City	108.5	85.9	120.2	133.4
KARPOWER	120.0	113.7	65.9	167.7
AMERI	-	-	-	-
KTPP	57.1	13.6	63.2	63.2
CENPOWER	217.7	218.9	241.1	143.3
AKSA	23.2	26.5	25.0	58.0
Bridge Power	-	-	-	-
Total Domestic Supply (GWh)	1,850.6	1,893.5	2,047.5	2,074.1
Imports (GWh)	-	0.9	-	3.7
Total Supply (GWh)	1,850.6	1,894.4	2,047.5	2,077.7
Ghana Coincident Peak Load (MW)	3,146.0	3,268.1	3,259.0	3,231.9
System Coincident Peak Load (MW)	3,496.0	3,525.9	3,609.0	3,513.9

HIGHLIGHTS OF THE MONTH

decreased at a rate of 0.28feet day in March, 2023.

Natural gas remains the primary fossil fuel for the generation of electricity in the Ghana Wholesale Electricity Market. The share of the natural gas used to generate electricity by thermal power plants was 99.9%.

ELECTRICITY TRADING

Electricity Demand

The System Peak load for March, 2023 was 3,513.86MW as compared to 3,525.90MW in February, 2023 which was 0.34% lower than what was recorded in February, 2023. This decrease is attributable to the decrease in domestic Peak load in March, 2023. For the first quarter of 2023, Ghana attained its System Peak Load in January, 2023 of 3,557.38MW. The System Peak Load has reduced by an average of 0.06% between January and March, 2023.

The Ghana Peak Load declined by 1.1% in March 2023 from February, 2023. The Ghana Peak load for February, 2023 was 3,268.10MW and it declined to 3,231.86MW in March, 2023. The Load factor for March 2023 was 79.48%. In the first quarter of 2023, the Ghana Peak Load reached its peak in February, 2023 of 3,268.1MW. Ghana's demand has shown an upward increase of 1.6% per month from January to March, 2023

Ghana's domestic demand has shown an upward trajectory in the first quarter of 2023 with export to our neighboring countries showing a decline.

Electricity export at the System Peak load to CIE, CEB and SONABEL was 282MW in March, 2023. This was made up 57MW, 75MW and 150MW for CIE, CEB and SONABEL respectively. There was a decrease in export demand from 296MW in February, 2023 to 282MW in March 2023 is attributable to the decrease in export demand to CIE and SONABEL.

In March, 2023 the average electricity demand decreased by 0.9% to 2,774.03MW from 2,794.13MW in February, 2023

The average electricity demand for regulated market was 2,208MW which was lower than the 2893MW in February, 2023. This could be attributable to the cold weather conditions in March, 2023 which did not necessitate the need for cooling. For the regulated markets, ECG accounted for 87% of the average demand whilst NEDCO and Enclave Power accounted for an average of 11.4% and 1.7% respectively.

The average demand for the de-regulated market was 188.92MW for March, 2023. The mines accounted for 91.3% whilst bulk customers accounted for 8.7% of the de-regulated market demand. Export markets recorded an average demand of 377.12 MW for March, 2023. In relation to export to neighboring countries, 73.2% accounted for export demand while VALCO accounted for the rest

Electricity supply

Electricity supply decreased in March, 2023 from an average of 67.65GWh per day to 67.02GWh per day, representing a 0.9% decrease. Total supply on the other hand was 2,070.4GWh in March, 2023 compared to 1,894.39Gwh due to the higher number of days in March 2023 than February, 2023.

In the first quarter of 2023, supply increased by 2.4% compared to the total supply in the first quarter of 2022. In addition, domestic supply accounted for 99.8% of the total generation while inadvertent imports from CIE accounted for 0.18%. Electricity export for the month of March, 2023 totaled 205.4GWh and this was lower than the 262.5GWh projected in the 2023 supply plan.

Electricity supplied by thermal plants in March, 2023 constituted 61.36% of the total electricity supplied. The contribution of electricity supplied from the solar power plant was 0.36% whilst hydro accounted for the rest. Hence renewable energy accounted for 38.46% of total supply in March, 2023. Thermal Plants have the greatest share in the electricity mix.

A total of 1,890.96GWh of electricity was supplied to the Regulated Market in March, 2023 whilst de-regulated and export were supplied with 140.56GWh and 280.58GWh respectively.

A total of 205.4GWh of electricity was supplied to the export market to our neighboring countries in March, 2023. Electricity export to CIE was 31.6GWh which was lower than the 49.67GWh recorded in February, 2023. Export to CEB in March, 2023 was 66.4Gwh and this was higher than what was recorded in February, 2023. SONABEL'S exported electricity export was 107.4GWh which had increased from the 91.76GWh recorded in February, 2023.

HYDRO DAM LEVELS

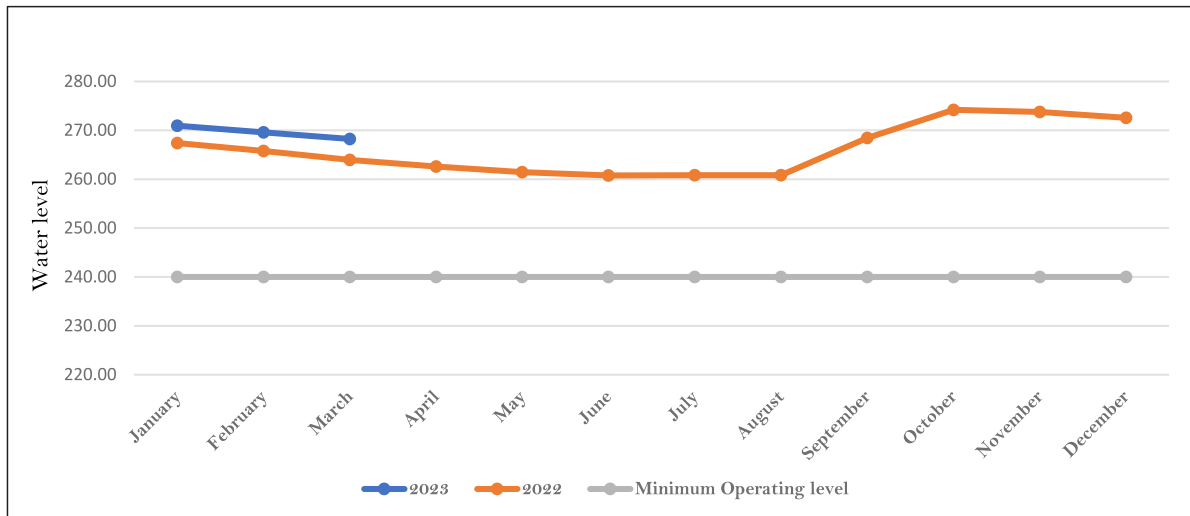
Rate of drop of the Akosombo Dam decreased in March 2023

The rate of drop in the water level for the Akosombo GS increased in March, 2023 compared to February, 2023. The rate of drop in February, 2023 was 0.049feet per day and 0.043feet in March, 2023. As a result, the water level decreased from 269.58feet recorded at the beginning of the month dropped to 268.24feet at the end of March, 2023 which was higher than what was recorded in the same period of 2022. The month end water level of March, 2023 was 4.28feet above the water level recorded for the same period in 2022 and 28.24feet above the minimum operating level of the dam

Figure 1 shows the comparative end-of-month trajectory of the level of water in the Akosombo Dam from January 2022 to March 2023

HIGHLIGHTS OF THE MONTH

Figure 1: Month-End Water Level for Akosombo Dam from January 2022 to March 2023.

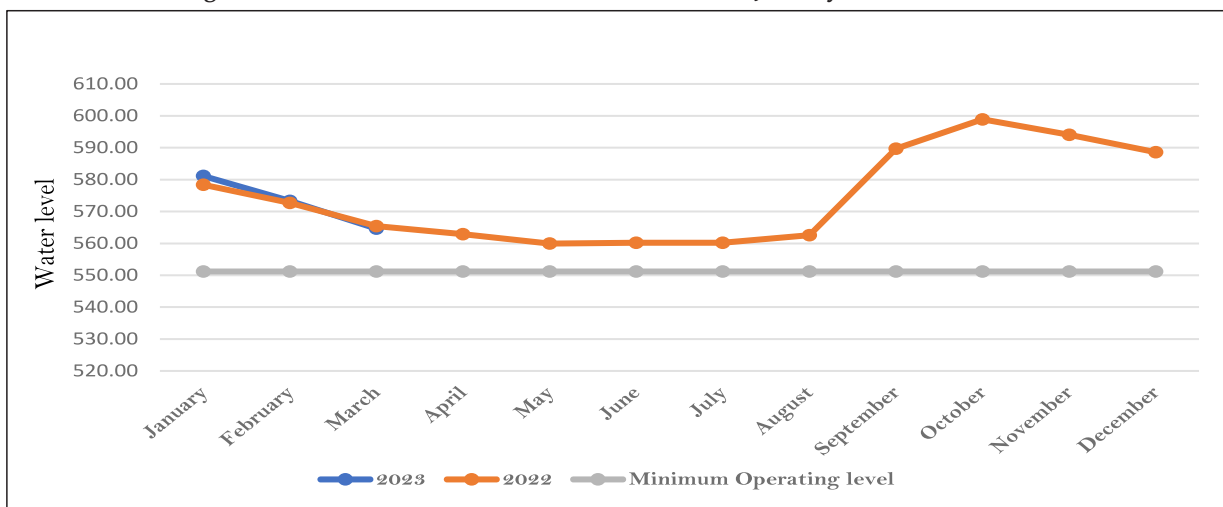


Bui dam water level rate of drop remains the same in March 2023

Bui dam water level remains the same in March, 2023 at 0.28 feet per day. Due to the higher number of days in March and February, 2023, the drop in the water level increased from 7.78feet in February 2023 to 8.73feet in March, 2023. As a result, the water level of 573.36feet recorded at the beginning of the month dropped to 564.63feet at the end of March, 2023 which was lower than what was recorded in the same period of 2022. The month end water level of March, 2023 was 0.82feet above the water level recorded for the same period in 2022 and 13.45feet above the minimum operating level of the dam

Figure 2 shows the comparative end-of-month trajectory of the level of water in the Bui dam from January 2022 to March 2023

Figure 2: Month-End Water Level for Bui Dam from January 2022 to March 2023



FUEL SUPPLY FOR POWER GENERATION

Natural gas imports increased in March, 2023

The supply of natural gas from Nigeria through the West African gas pipeline increased to 73.58MMSCFD in March, 2023 from 54.2MMSCFD in February, 2023. This represents a 35.8% increase. This increase was in response to the shutdown in the Ghana National Gas processing plant from 22nd March, 2023 to 7th April, 2023. Natural gas imports accounted for 25.1% in the total fuel mix and natural gas supply mix accounted for 25.1%

Natural gas supply from domestic sources decreased in March, 2023

The average natural gas supply for March 2023 from domestic sources was 220.92MMSCFD which was lower than the gas supply of 260.1MMSCFD in February, 2023. On the average natural gas from domestic sources accounted for 74.8% in the total fuel mix and 74.9% in the gas supply mix

Consumption of liquid fuel increased in March 2023

In March 2023, there was a record of liquid fuel consumption of 1,501.12bbls made up of 1,472.31 LCO and 28.81 DFO. On the average, liquid fuel accounted for an average of 0.1% in the total fuel mix. LCO accounted for 98% of the total liquid mix while DFO accounted for 2.0% The plants responsible for the consumption of the liquid fuels, LCO and DFO in March, 2023 was Cenpower

OPERATIONAL FACT SHEET

Monthly Market Data Analysis

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

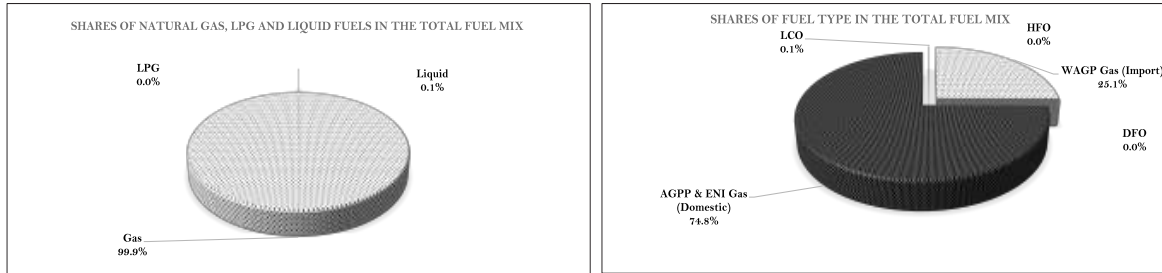


Figure 4a: Contribution of Natural Gas Supply by sources

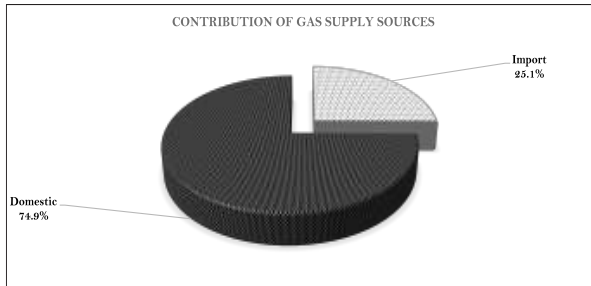


Figure 4b: Contribution of individual fuel in the liquid fuel supply

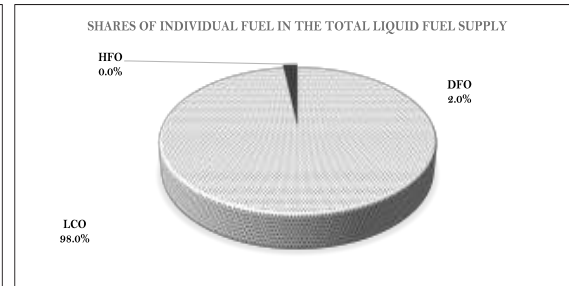


Figure 5a: Electricity Supply by sources

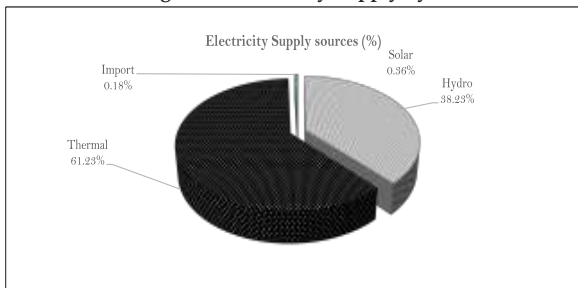
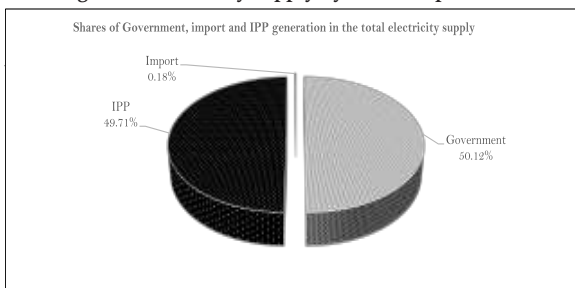


Figure 5b: Electricity supply by ownership



Peak Electricity Supply for March 2023

Source of Supply	Generation at System Peak Load (MW)	Generation at Ghana Peak Load (MW)
AKOSOMBO	911.53	911.53
KPONG	137.56	137.56
BUI	329.85	329.85
BUI Solar	-	-
SEAP	491.50	491.50
TAPCO	296.22	296.22
TICO	345.50	345.50
TT1PP	-	-
CENIT	-	-
TT2PP	10.00	10.00
TWIN CITY	195.30	195.30
KARPOWER	442.00	442.00
AMERI	-	-
KTPP	102.00	102.00
Trojan Power	-	-
CENPOWER	182.00	182.00
AKSA	70.40	70.40
Bridge Power	-	-
IMPORT	-	-
Export to CIE at peak	57.00	57.00
Export to CEB at peak	75.00	75.00
Export to Sonabel	150.00	150.00
System Coincident Peak Load	3,513.86	
Ghana Coincident Peak Load		3,231.86

OPERATIONAL FACT SHEET

March 2023 Average Monthly Natural Gas Flowrate (MMSCFD)	
Location	Monthly Average
Etoki	69.20
Tema WAGPCo	127.28
Aboadze WAGPCo	173.81
Aboadze GNGC	66.68
Reverse Flow	58.57
ENI	207.55

Hydro Dam Water level for March 2023			
	Beginning month (ft)	End month (ft)	Change in water level
Hydro Dam			(feet)
Akosombo	269.58	268.24	-1.34
Bui	573.36	564.63	-8.73

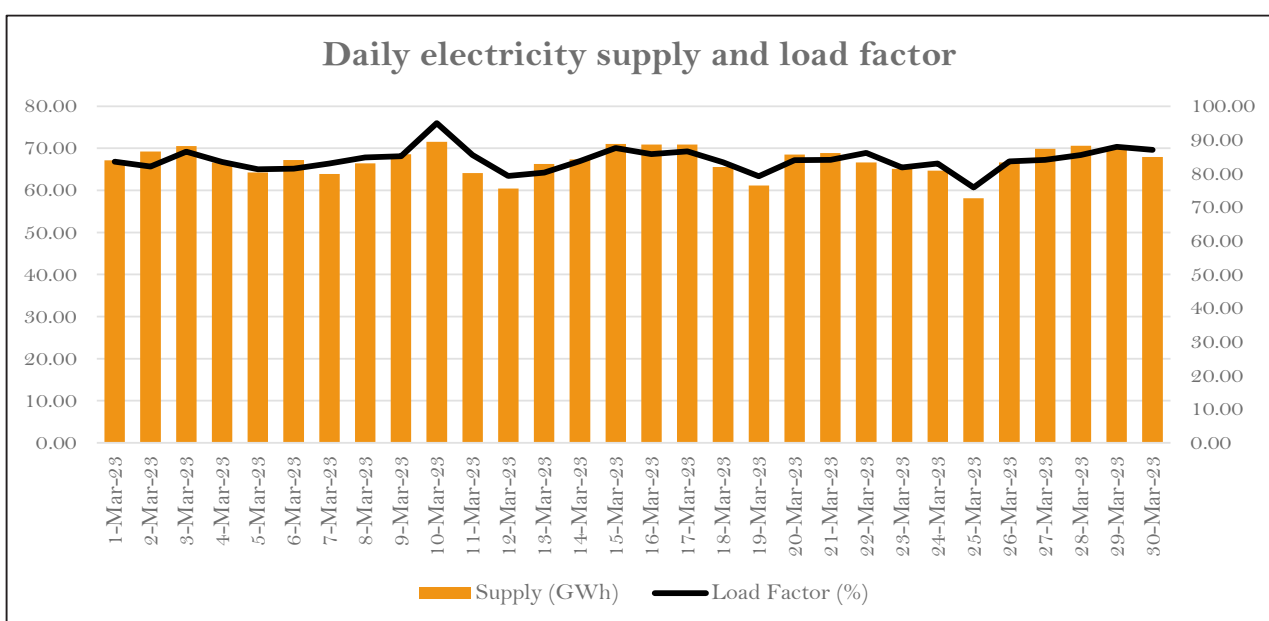
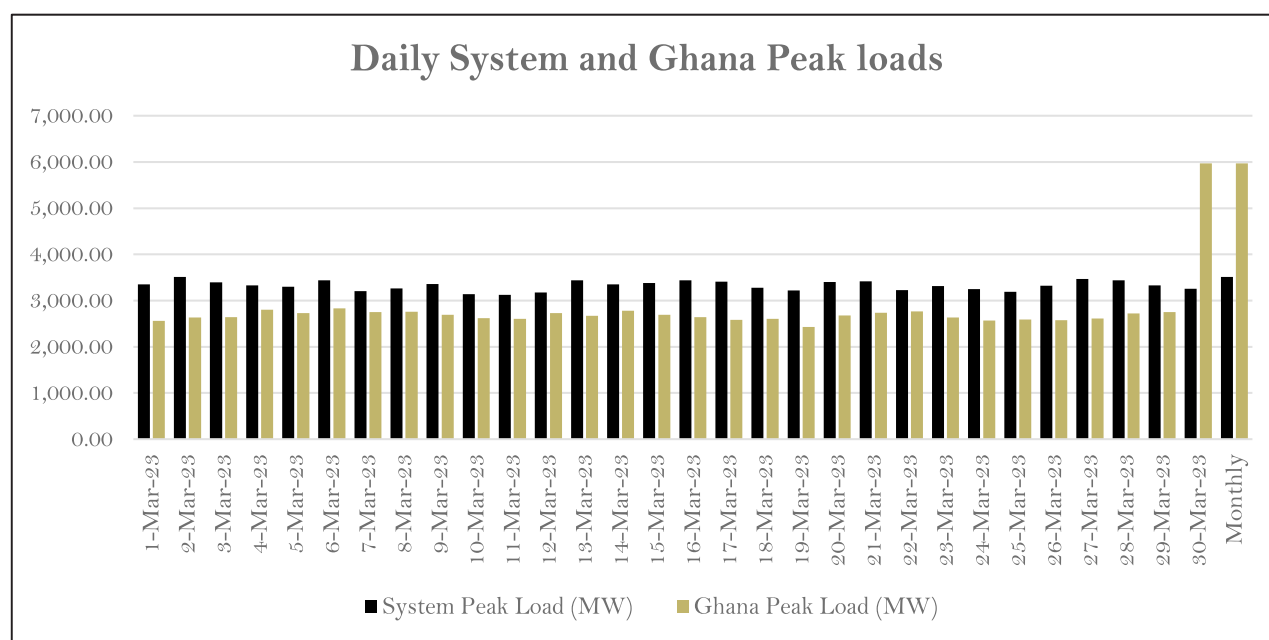
Month Average fuel prices						
	Gazetted Natural Gas Price	Weighted average natural gas price	LCO	HFO	DFO	LPG
US\$/MMBtu	6.08	6.18	22.37	18.37	38.48	17.96

Power Plants	Average fuel price (US\$/MMBtu)
TAPCO	6.08
TICO	6.08
SAPP	6.08
TT ₂ PP	6.08
TT ₁ PP	6.08
CENIT	6.08
KARPOWERSHIP	6.08
AMERI PLANT	0.00
KPONE THERMAL	9.64
CENPOWER	6.36
AKSA ENERGY	11.21
Twin City	6.09
Bridgepower	0.00

Weekly Electricity Supply (GWh)					
	Week 1	Week 2	Week 3	Week 4	Total
AKOSOMBO	121.47	121.94	115.83	188.78	548.02
KPONG	20.83	20.79	20.13	32.03	93.78
BUI Hydro	28.08	28.99	37.07	54.56	148.70
Bui Solar	1.74	1.68	1.67	2.39	7.48
VRA Kaleo	0.40	0.35	1.20	1.02	2.96
SAPP	66.00	55.02	63.53	76.74	261.28
TAPCO	42.70	49.40	41.03	32.22	165.34
TICO	56.34	56.14	55.92	80.50	248.91
TT ₁ PP	1.30	5.31	0.00	0.00	6.61
CENIT	0.00	5.12	10.34	3.97	19.43
TT ₂ PP	1.59	1.69	1.54	1.21	6.03
Twin City	26.76	30.45	32.18	44.01	133.40
KARPOWER	39.51	27.63	32.57	67.98	167.69
AMERI	0.00	0.00	0.00	0.00	0.00
KTPP	16.08	12.20	19.88	15.00	63.15
Cenpower	29.21	29.22	35.40	49.45	143.28
AKSA	16.34	18.10	8.00	15.23	57.67
Bridge Power	0.00	0.00	0.00	0.00	0.00
Import	0.59	0.81	0.66	1.61	3.67
Total	468.93	464.83	476.93	666.70	2,077.40

OPERATIONAL FACT SHEET

	Heat rate (Btu/kWh)	Fuel Consumption (MMBtu)			
		Natural gas	LCO	HFO	DFO
TAPCO	9,150.31	1,512,948.88	-	-	-
TICO	7,439.33	1,851,689.34	-	-	-
SAPP	7,949.87	2,077,180.32	-	-	-
TT2PP	11,256.73	67,878.07	-	-	-
TT1PP	12,713.92	84,039.04	-	-	-
CENIT	11,740.68	228,086.19	-	-	-
KARPOWERSHIP	8,667.11	1,453,399.59	-	-	-
AMERI PLANT	-	-	-	-	-
KPONE THERMAL	10,797.12	606,867.06	-	-	74,988.19
CENPOWER	9,218.45	1,299,294.09	20,597.12	-	923.65
AKSA ENERGY	10,672.00	358,723.92	-	256,726.32	-
Twin City	7,817.18	1,042,266.01	541.63	-	0.34
Bridgepower	-	-	-	-	-



ECONOMIC FACT SHEET



ELECTRICITY MARKET OVERSIGHT PANEL (EMOP)

2019

ANNUAL REPORT

REVIEW OF THE GHANA WHOLESALE
ELECTRICITY MARKET



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...Watch out for 2020 to 2022 edition!

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

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

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