GHANA WHOLESALE ELECTRICITY MARKET BULLETIN

MARKET WATCH

Monthly Market Data Analysis

ISSUE NO. 91 **1st January 2024 to 31st January 2024**

This Bulletin covers major developments in the Wholesale Electricity Market (WEM) of Ghana from 1st January 2024 to 31st January 2024. It analyses the performance of the key WEM indicators against their benchmarks and examines the likely implications of any discernable trends in the market.

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. The Electricity Market Oversight Panel (EMOP) would very much appreciate and welcome comments from readers on the Bulletin.

HIGHLIGHTS OF THE MONTH

The System Peak Load for January 2024 was 3,398MW which was lower than the 3,557MW in January 2023. The System Peak Load was made up of 3,149MW of domestic demand and 249MW of export demand. The Ghana Peak Load which is Ghana's demand (excluding export) for January 2024 was 3,149MW which was lower than the 3,161.4MW recorded in January 2023

Generally, electricity supply increased in January 2024 compared to January 2023 but exports to our neighboring countries declined. A total of 2,105 GWh of electricity was supplied in January 2024 which was 3.6% higher than the 2,032MW recorded in January 2023. Electricity export for the month totaled 184.6GWh and this was lower than the 203.9GWh in January 2023.

The Regulated Market accounted for 80.9% of electricity purchased in the Ghana Wholesale Electricity Market in January 2024. The De-regulated Market accounted for 6.5% in January 2024 whilst the Export Market accounted for 12.5%.

We began the year 2024 with Akosombo Dam water level at 274.64ft, 2.9ft below the maximum operating level and 33.3ft above the water level for the same period in 2023. The water level decreased to 273.30ft at the end of the month at a rate of 0.04 ft per day in January 2024.

The water level for the Bui Dam at the beginning of the year was 31.77ft below the maximum operating level. The water level continued to decrease at a rate of 0.32ft per day to end the month of January 2024 at a water level of 568.57 ft.

Table 1. Actual Outturn of Electricity Demand and Supply in January 2023 and January 2024.

	Jan-23	Jan-24
	Actual	Actual
Total Supply (GWh)	2,119.4	2,105.0
Source by Power Plants (GWh)		
AKOSOMBO	640.2	602.1
KPONG	107.7	101.2
BUI	153.8	181.7
BUI Solar	7.3	7.2
Kaleo	2.2	3.7
Sunon Asogli	144.8	231.8
TAPCO	-	47.1
TICO	196.4	117.2
TT1PP	43.1	74.4
CENIT	19.4	5.3
TT2PP	-	-
Twin City	136.6	137.4
KARPOWER	285.9	316.1
AMERI	-	-
KTPP	36.4	38.9
CENPOWER	218.9	147.9
AKSA	55.8	64.9
Bridge Power	65.1	12.2
Total Domestic Supply (GWh)	2,113.6	2,089.2
Imports (GWh)	5.7	15.8
Total Supply (GWh)	2,119.4	2,105.0
Ghana Coincedent Peak Load (MW	3,119.6	3,149.0
System Coincident Peak Load (MW	3,617.6	3,398.0

OVERVIEW OF THE MONTH

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 94.1%. This underscores the growing importance of natural gas in Ghana's electricity generation mix especially for thermal power plants.

ELECTRICITY TRADING

Electricity Demand

The System Peak Load for January 2024 was 3,398MW as compared to 3,558MW in January 2023 which was 4.4% lower than what was recorded in January 2023. This decrease is attributable to the decrease in exports.

In the 4th quarter of 2023, export at the System Peak Load showed an upward trajectory from 363MW in October to 452MW in November and 498MW in December 2023. The export at the System Peak Load for January 2024 was 249MW made up of 5MW, 65MW, and 179MW for CIE, CEB and SONABEL respectively. The electricity export recorded at the System Peak Load was 50% lower than what was recorded in December 2023 due to the decrease in export demand to CIE in January 2024.

The Ghana Peak Load showed an increasing trend from October 2023 to January 2024. Chronologically, the Ghana Peak Load for October, November and December 2023 was 2,834.7MW, 3,076.3MW, 3,119.3MW and 3,149MW in January 2024. The load factor for January 2024 was 83.3%.

The average electricity demand for January 2024 was 2,735MW. In the 4th quarter of 2023, the average electricity demand increased from 2,508MW in October 2023 to 2,750MW in November 2023. The average electricity demand then decreased by 0.6% from November 2023 to 2,733MW in December 2023. Average electricity demand has therefore increased in January 2024 by 2MW compared to the average demand in December 2023.

The average electricity demand for the Regulated Market increased to 2,212MW in January 2024 from 2,142MW recorded in December 2023. This could be attributed to hot weather conditions that necessitated the need for cooling in January 2024. For the regulated markets, ECG accounted for 88.4% of the average demand whilst NEDCO and Enclave power accounted for an average of 9.99% and 1.3% respectively. In addition, VRA township accounted for 0.3% of the average electricity demand for the Regulated Market.

The average demand for the De-regulated Market was 177MW for January 2024. The mines accounted for 89.1% whilst bulk customers accounted for 10.9% of the De-regulated market demand. Export Markets recorded an average demand of 343MW for January 2024. Demand from neighbouring countries accounted for 72.3% of our export demand whilst VALCO accounted for 27.7%.

Electricity supply

Electricity supplied decreased in January 2024 from an average of 68.4GWh per day in December 2023 to 67.9GWh per day in January 2024 representing a 0.7% decrease. On a year-on-year basis, there was a decline in electricity supply. The total Supply for January 2024 was 2,105GWh whilst January 2023 was 2,119.4GWh. This shows a general trend of decrease in supply for January 2024.

Domestic supply accounted for 99.3% of the total generation while inadvertent imports from CIE accounted for 0.8%. Electricity export for January 2024 totaled 184.6GWh and this was lower than 203.9GWh recorded same period in 2023.

Electricity supplied by thermal plants in January 2024 constituted 56.7% of the total electricity supplied. solar power plants contributed 0.5% of electricity supplied. Hydro accounted for 42.1%. For this reason, renewable energy accounted for 42.6% of total supply in January 2024.

A total of 1,646.1GWh of electricity was supplied to the regulated market in January 2024 which includes ECG, NEDCO, Enclave Power and VRA township.

The consumption by power plants to keep the plants in readiness accounted for 2.2GWh.

De-regulated market and Export were supplied with 131.5GWh and 255.3GWh respectively

A total of 184.6GWh of electricity was supplied to our neighbouring countries in January 2024. Electricity export to CIE was 21.6GWh which dropped from 24.8GWh recorded in December 2023. Furthermore, export to CEB dropped as well to 51.2GWh. The total electricity exported to SONABEL was 111.9GWh.

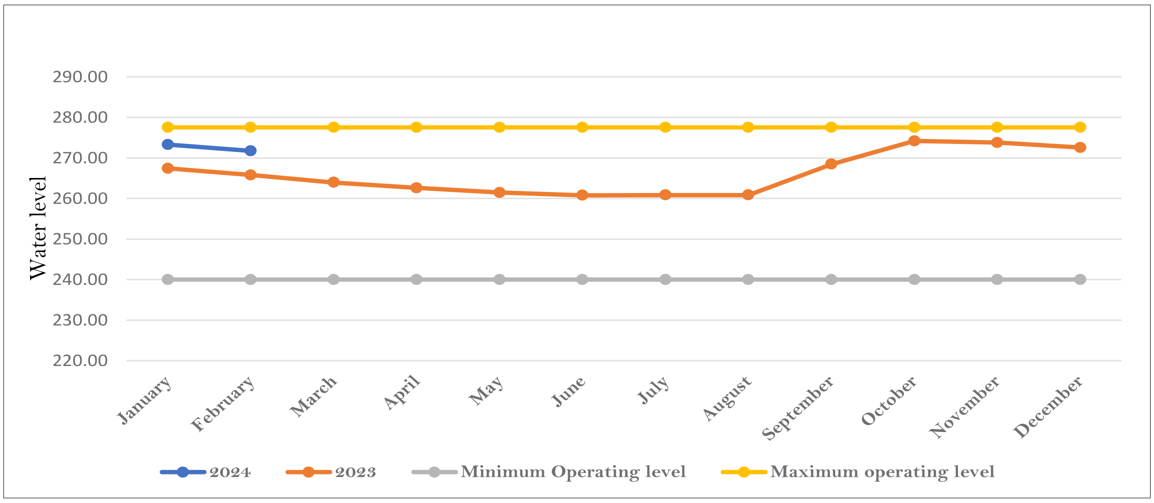
HYDRO DAM LEVELS

Akosombo Dam begins 2024 at a higher water level than in 2023

The Akosombo dam began in 2024 at a water level of 274.64ft, which is 5.9ft above the water level at the beginning of 2023. The Dam maintained the rate of drop in the water level at 0.04ft per day similar to the rate of drop in December 2023. The water level at the beginning of the month dropped by 1.34ft to 273.30ft at the end of the month which was 4.24ft below the maximum operating level and 33.3ft above the minimum operating level.

Figure 1 shows the comparative end-of-month trajectory of the level of water in the Akosombo Dam from January 2023 to January 2024

Figure 1: Month-End Water Level for Akosombo Dam from January 2023 to January 2024.



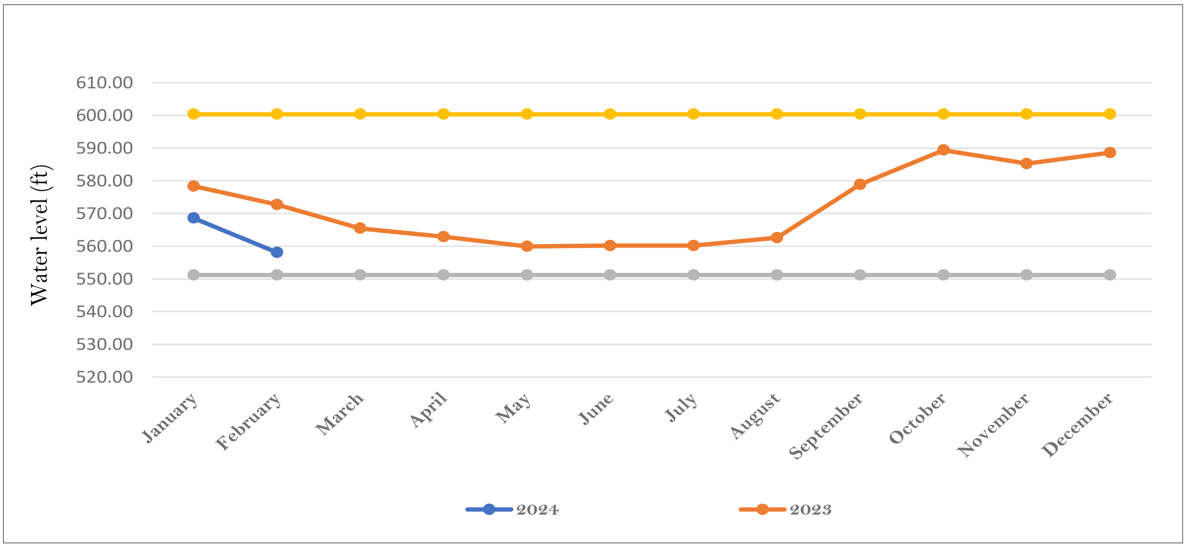
Bui Dam begins 2024 at a lower water level than in 2023

Bui Dam water level at the beginning of 2024 was 9.8ft below the water level recorded for the same period of 2023. In January 2024, the water level decreased by 9.84ft from 578.41ft at the beginning of the month to 568.57ft at the end of the month at a rate of drop of 0.32ft per day. There was however a marginal reduction in the rate of drop in the water level from 0.33ft per day in December 2023 to 0.32ft per day in January 2024.

Also, the dam was 17.4ft above the minimum operating level and 31.8ft below the maximum operating level of the Dam in January 2024

Figure 2 shows the comparative end-of-month trajectory of the level of water in the Bui Dam from January 2023 to January 2024

Figure 2: Month-End Water Level for Bui Dam from January 2023 to January 2024



FUEL SUPPLY FOR POWER GENERATION

Natural gas imports increased in January 2024

The supply of natural gas from Nigeria through the West African Gas Pipeline increased to 55.39MMSCFD in January 2024 from an average of 52.15MMSCFD in the 4th quarter of 2023. This represents an increase of 6.21%. On average, gas imports accounted for 18.3% of the total fuel mix and 19.5% of the gas supply mix in January 2024

Natural gas supply from domestic sources was reduced in January 2024

The average natural gas supply for January 2024 was 238.10MMSCFD which was lower than the average gas supply of 244.32MMSCFD in the 4th quarter. On average natural gas from domestic sources accounted for 75.5% of the total fuel mix and 80.5% of the gas supply mix

Consumption of liquid fuel increased in 2024

Liquid fuel consumption increased in January 2024 from the 88,731bbls recorded in December 2023 to 112,907bbls. This included 81,840bbls DFO and 31,066bbls HFO. On average, liquid fuel accounted for 5.9% of the total fuel mix. HFO and DFO accounted for 30% and 70% of the total liquid mix. The plants responsible for the consumption of liquid fuel, HFO and DFO were AKSA and HFO respectively.

Monthly Market Data Analysis

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

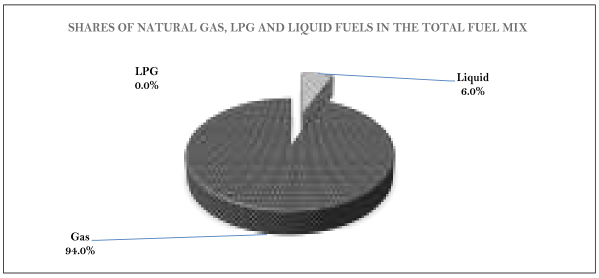


Figure 3b: Shares of fuel types in the generation fuel mix of power generation

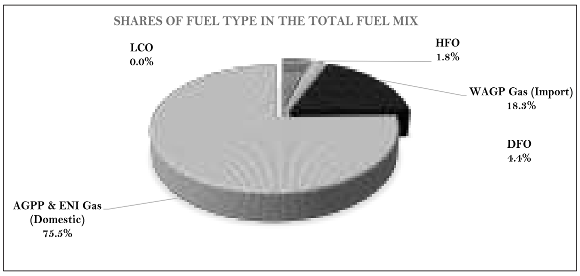


Figure 4a: Contribution of Natural Gas Supply by Sources

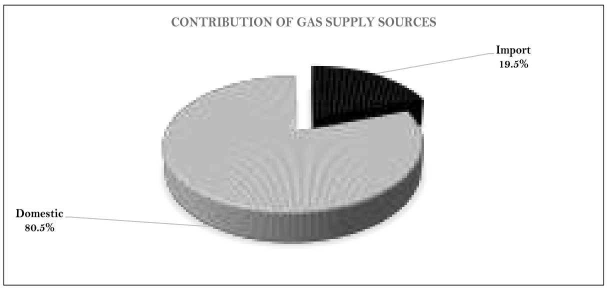


Figure 4b: Contribution of individual fuel in the liquid fuel supply

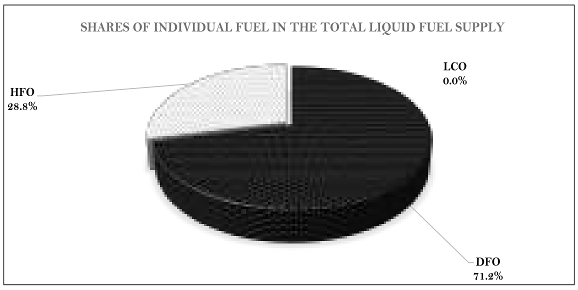


Figure 5a: Electricity Supply by sources

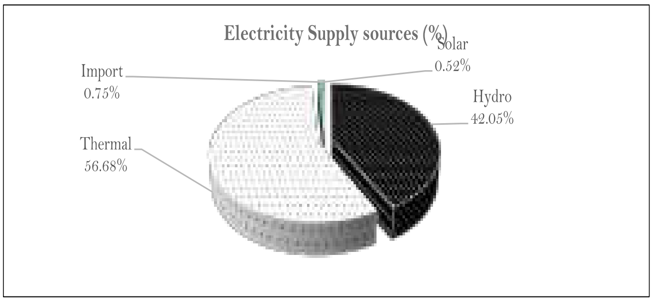
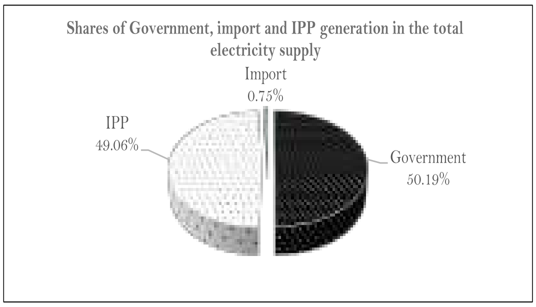


Figure 5b: Electricity supply by ownership



Peak Electricity Supply for January 2024		
Source of Supply	**Generation at System Peak Load (MW)**	**Generation at Ghana Peak Load (MW)**
AKOSOMBO	974.90	974.90
KPONG	151.00	151.00
BUI	330.10	330.10
BUI Solar	-	-
SEAP	532.40	532.40
TAPCO	105.00	105.00
TICO	108.00	108.00
TT1PP	-	-
CENIT	-	-
TT2PP	-	-
TWIN CITY	191.30	191.30
KARPOWER	458.80	458.80
AMERI	-	-
KTPP	190.00	190.00
Trojan Power	-	-
CENPOWER	115.00	115.00
AKSA	241.50	241.50
Bridge Power	-	-
IMPORT	-	-
Export to CIE at peak	5.00	5.00
Export to CEB at peak	65.00	65.00
Export to Sonabel	179.00	179.00
System Coincident Peak Load	**3,398.00**	
Ghana Coincedent Peak Load		**3,149.00**

OPERATIONAL FACT SHEET

(MMSCFD)	
Location	Monthly Average
Etoki	51.14
ENI	226.09
Aboadze AGPP	86.27
Reverse Flow	79.43
Tema Consumption	129.28
Takoradi Consumption	167.59

Hydro Dam Water level for January 2024			
	Beginning month (ft)	End month (ft)	Change in water level
Hydro Dam			(feet)
Akosombo	274.64	273.30	-1.34
Bui	578.41	568.57	-9.84

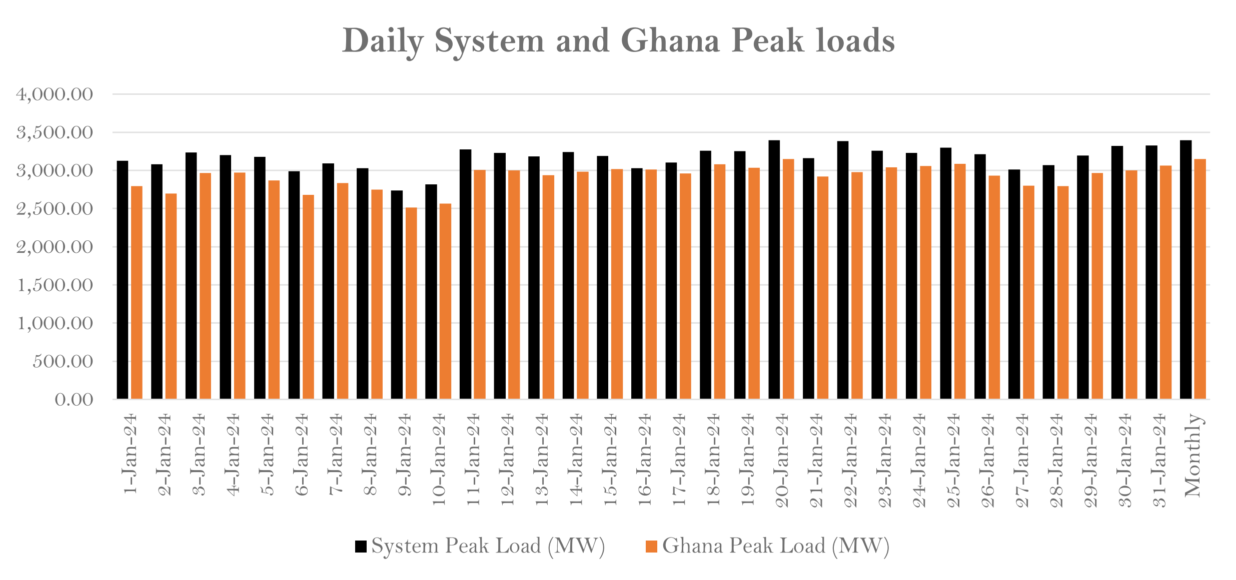
	Weekly Electricity Supply (GWh)				
	Week 1	Week 2	Week 3	Week 4	Total
AKOSOMBO	130.99	127.47	137.45	206.20	602.11
KPONG	22.35	21.17	22.73	34.98	101.22
BUI Hydro	41.25	46.52	41.82	52.12	181.72
Bui Solar	1.53	1.63	1.62	2.43	7.21
VRA Kaleo	0.78	0.85	0.88	1.24	3.75
SAPP	29.45	45.09	65.59	91.66	231.79
TAPCO	0.00	5.64	17.08	24.39	47.11
TICO	36.48	36.21	18.62	25.92	117.22
TT1PP	17.15	17.14	17.04	23.06	74.39
CENIT	0.00	0.00	1.62	1.06	2.67
TT2PP	0.00	0.00	0.00	0.00	0.00
Twin City	31.20	30.74	30.84	44.58	137.36
KARPOWER	73.74	71.19	74.45	105.75	325.14
AMERI	0.00	0.00	0.00	0.00	0.00
KTPP	6.21	10.67	10.28	11.73	38.89
Cenpower	43.68	44.22	22.44	32.55	142.90
AKSA	18.39	9.56	14.37	22.57	64.89
Bridge Power	15.76	0.00	0.00	0.00	15.76
Import	1.29	1.78	1.85	1.00	5.91
Total	**470.25**	**469.88**	**478.69**	**681.24**	**2,100.05**

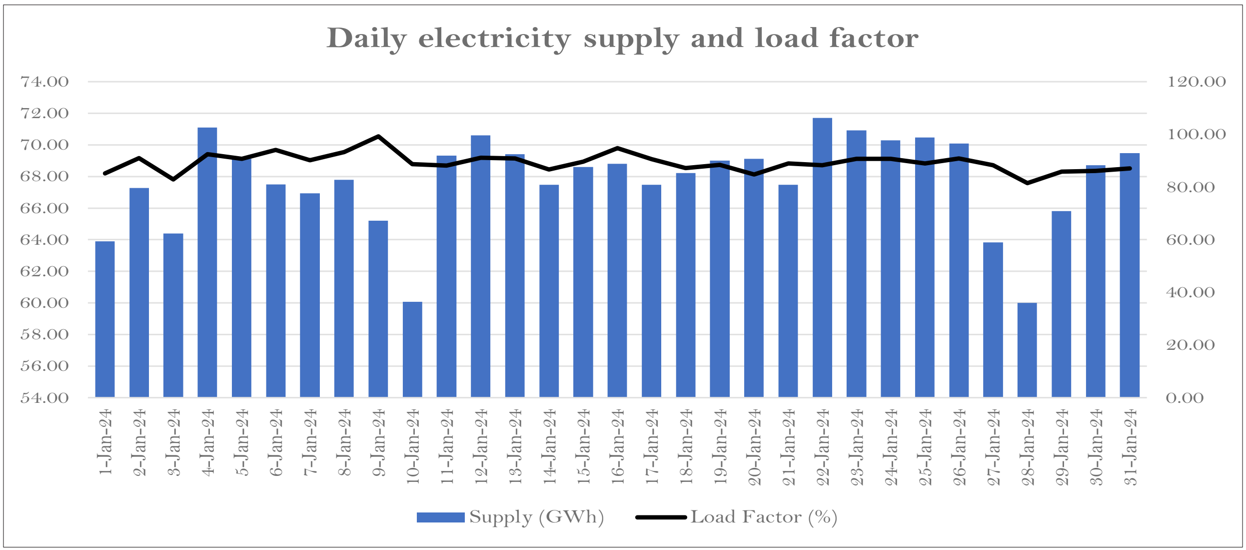
		Fuel Consumption (MMBtu)			
	Heat rate (Btu/kWh)	Natural gas	LCO	HFO	DFO
TAPCO	12,335.85	581,154.40	-	-	-
TICO	10,794.45	1,265,292.54	-	-	-
SAPP	8,274.17	1,917,905.09	-	-	-
TT2PP	-	-	-	-	-
TT1PP	12,041.87	895,819.02	-	-	-
CENIT	14,139.88	37,760.56	-	-	-
KARPOWERSHIP	8,032.12	2,611,525.63	-	-	-
AMERI PLANT	-	-	-	-	-
KPONE THERMAL	11,300.89	-	-	-	439,484.96
CENPOWER	8,209.47	1,173,118.45	-	-	-
AKSA ENERGY	8,737.80	378,913.22	-	188,108.52	-
Twin City	7,854.72	1,078,916.80	-	-	-
Bridgepower	7,487.27	118,027.78	-	-	-

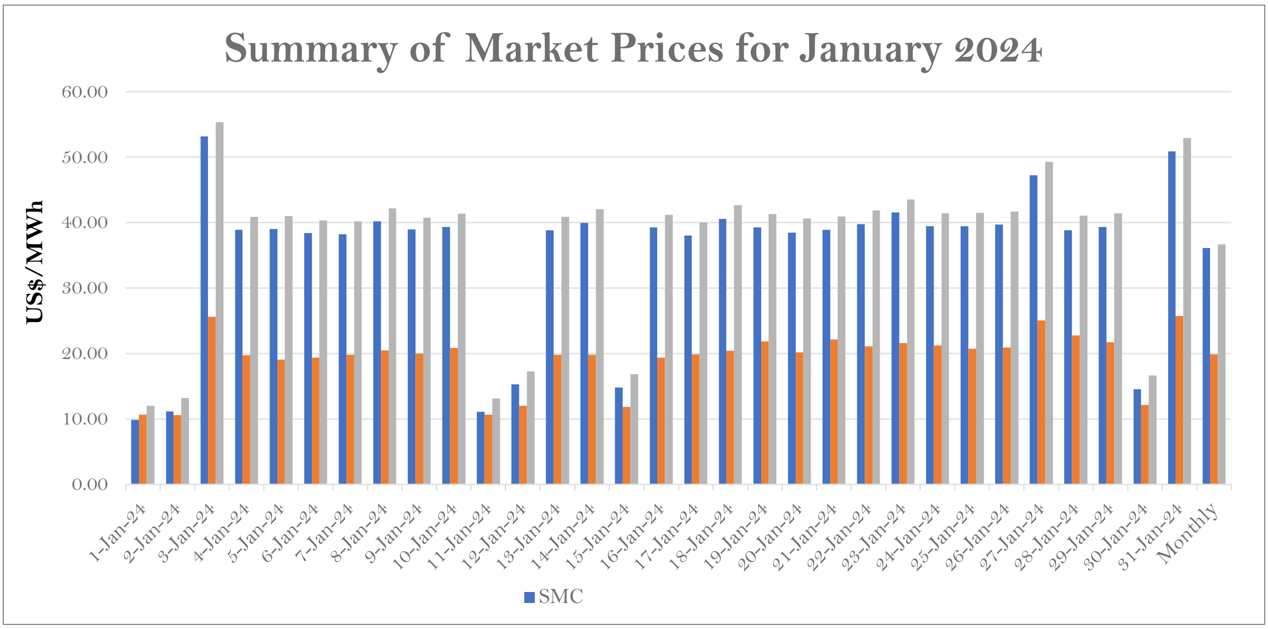
Monthly Average Electricity Prices in the WEM				
		Jan-24	Dec-23	Change
Average Market Price (AMP)	US$/MWh	183.03	119.39	63.64
System Marginal Cost (SMC)	US$/MWh	343.00	149.35	193.65
System Marginal Price (SMP)	US$/MWh	366.15	159.47	206.68

Power Plants	Average fuel price (US$/MMBtu)
TAPCO	7.64
TICO	7.64
SAPP	7.64
TT2PP	0.00
TT1PP	7.64
CENIT	7.64
KARPOWERSHIP	7.64
AMERI PLANT	0.00
KPONE THERMAL	38.48
CENPOWER	7.64
AKSA ENERGY	11.20
Twin City	7.64
Bridgepower	7.64

	Month Average fuel prices					
	Gazetted Natural Gas Price	Weighted average natural gas price	LCO	HFO	DFO	LPG
US$/MMBtu	5.97	6.43	22.37	18.37	38.48	17.96






Summary of Market Prices for January 2024
US$/MWh
60.00
50.00
40.00
30.00
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1-Jan-24
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Monthly
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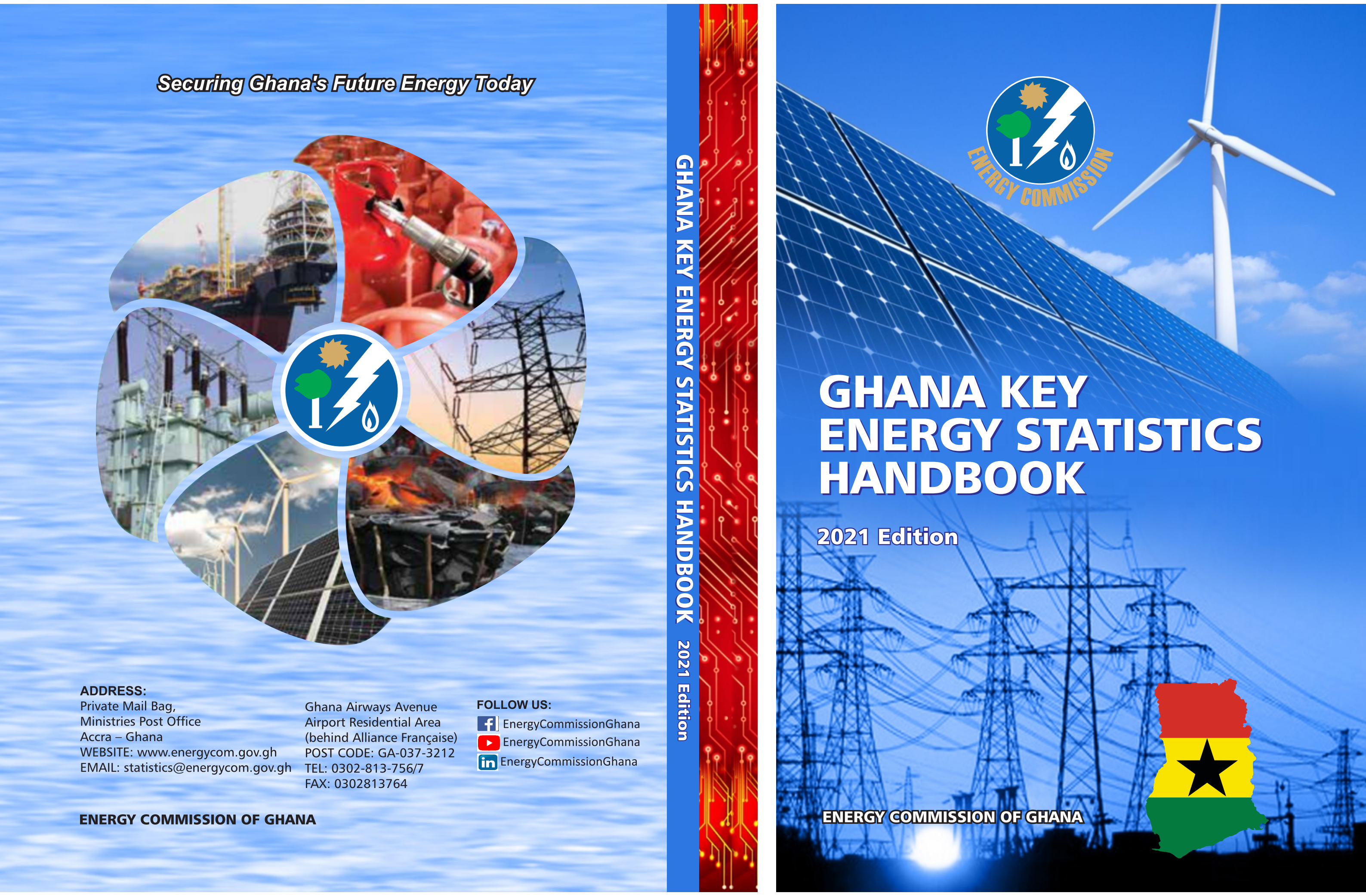
OTHER MARKET NEWS AND TRENDS



Acronyms

AGPP = Atuabu Gas Processing Plant	*Btu = British Thermal Units*
CBGC = Composite Bulk Generation Charge	*CUF = Capacity Utilization Factor*
DFO = Distillate Fuel Oil	*EC = Energy Commission*
ECG = Electricity Company of Ghana	*EMOP = Electricity Market Oversight Panel*
ESP – Electricity Supply Plan	*FPSO = Floating Production, Storage and Offloading*
GHp = Ghana Pesewa	*GNGC = Ghana National Gas Company*
GWh = Giga-Watt hours	*HFO = Heavy Fuel Oil*
KTPP = Kpone Thermal Power Plant	*kWh = kilo-Watt hours*
MRP = Mine Reserve Plant	*LEAP = Low Emissions Analysis Platform*
LCO = Light Crude Oil	*LI = Legislative Instrument*
LTA = Long Term Average	*MW = Megawatt*
MMscf = Million Standard Cubic Feet	*MWh = Mega-watt hours*
NITS = National Interconnected Transmission System	*PV = Photovoltaic*
SAPP = Sunon Asogli Power Plant	*SMP = System Marginal Price*
SNEP = Strategic National Energy Plan	*TEN = Tweneboa, Enyenra, Ntomme*
TT1PP = Tema Thermal 1 Power Plant	*TT2PP = Tema Thermal 2 Power Plant*
VRA = Volta River Authority	*WAGPCo – West African Gas Pipeline Company*
WAGP = West African Gas Pipeline	*WEM = Wholesale Electricity Market*

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