GHANA WHOLESALE ELECTRICITY MARKET BULLETIN

MARKET WATCH

Monthly Market Data Analysis

ISSUE NO. 95 **1st May 2024 to 31st May 2024**

This Bulletin covers major developments in the Wholesale Electricity Market (WEM) of Ghana from 1st May 2024 to 31st May 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 Secretariat (EMOPS) would very much appreciate and welcome comments from readers on the Bulletin.

HIGHLIGHTS OF THE MONTH

The System Peak Load for May 2024 was 3,500.9MW. The System Peak Load recorded in May 2024 was made up of 3,335.9MW of the domestic demand and 165MW of export. The Ghana Peak Load which is Ghana's system demand excluding export was 3,347MW higher than the 3,155.80MW recorded in May 2023.

The electricity supply for May 2024 averaged 67.6GWh per day and was 0.29% higher than what was recorded in May 2023. A total of 2,094.15GWh of electricity was supplied in May 2024 which was higher than the 2,087.90GWh recorded in May, 2023. Electricity export for the month totaled 128.32GWh.

The Regulated Market accounted for 83.1% of electricity purchased in the Ghana wholesale electricity market in May 2024. The De-regulated market accounted for 6.9% in May 2024 whilst the export market accounted for 9.9%.

The Akosombo Dam water level continued to decrease in May 2024. The dam's water level decreased to 266.30ft at the end of May 2023 from 268.15ft at the end of April 2024 at a rate of 0.06ft per day.

The water level at the beginning of May 2024 for Bui dam was 547.87ft, which decreased at a rate of 0.07ft per day to reach 545.80ft at the end of the month.

As natural gas continues to be the principal fossil fuel used to generate power, thermal power plants utilized 97% of the natural gas that was available for electricity generation. This emphasizes how crucial natural gas is to Ghana's mix of energy generating sources,

Table 1. Projected and Actual Outturn of Electricity Demand and Supply in May, 2023 and May 2024.

	May-23	May-24
	Actual	Actual
Total Supply (GWh)	2,087.9	2,094.15
Source by Power Plants (GWh)		
AKOSOMBO	598.6	662.02
KPONG	91.8	101.42
BUI	63.5	32.23
BUI Solar	6.9	7.54
Kaleo	2.8	3.97
Sunon Asogli	264.2	256.72
TAPCO	116.5	178.50
TICO	227.5	143.61
TT1PP	3.8	67.56
CENIT	11.6	-
TT2PP	6.1	-
Twin City	131.0	104.25
KARPOWER	205.1	149.84
AMERI	-	96.23
KTPP	71.2	70.81
GENSA		21.35
CENPOWER	199.3	96.56
AKSA	79.4	54.37
Bridge Power	-	38.58
Total Domestic Supply (GWh)	2,079.3	2,085.55
Imports (GWh)	8.6	8.60
Total Supply (GWh)	2,087.9	2,094.15
Ghana Coincedent Peak Load (MW)	3,153.5	3,347.00
System Coincident Peak Load (MW)	3,561.4	3,500.90

particularly for thermal power plants. One of the biggest dangers to a steady and dependable supply of energy is the natural gas supply, thus we must always maintain its security.

ELECTRICITY TRADING

Electricity Demand

The System Peak Load for May 2024 was 3,500.90 MW as compared to 3,561.40MW in April, 2024. This showed a 1.70% decrease from what was recorded in April 2024. This decrease is attributable to the decrease in export at the Peak Load.

The Ghana Peak Load decreased in May 2024 as compared to April 2024. The Ghana Peak Load decreased by 3.5% from 3,478.70MW in April 2024 to 3,357MW in May 2024.

Electricity export at the System Peak Load to CIE, CEB and SONABEL was 165MW in May 2024 whilst April 2024 accounted for 255MW. This shows a reduced contribution of export to the System Peak load in May 2024. The reduction includes 30MW, 44MW and 91MW to CIE, CEB and SONABEL respectively.

The average electricity demand for May 2024 was 2,685.36 MW compared to the 2,705.18MWin April, 2024. The average electricity demand therefore reduced in May 2024 by 0.7%.

The average electricity demand for Regulated Market in May 2024 was 2,231.13MW which is marginally lower than the 2,256.3MW recorded in April 2024. ECG accounted for 86.2% of the average demand while NEDCO and Enclave Power accounted for 11.6% and 1.73% respectively with a demand of 258.12MW and 38.58MW.

The demand for the De-regulated Market was 184.75MW for May 2024. The mining companies in the De-regulated Market accounted for 85% whilst Bulk Customers accounted for 15.2%. The average demand for export was 264.71MW. Export to the neighbouring countries accounted for 65.2% whilst VALCO accounted for 34.9%

Electricity supply

A total of 2,094.15GWh of electricity was supplied in May 2024 higher than the 2,087.90GWh supplied in May 2023. The supply of Electricity averaged 67.6GWh per day in May 2024 which is higher than the 67.4GWh supplied in May 2023. Additionally, domestic supply accounted or 99.6% of the total generation supplied while inadvertent imports from CIE accounted for 0.4%.

In the electricity mix for 2024, Thermal plants accounted for 61.1%. of the electricity supplied, whilst the contribution of solar was 0.6% as well as hydro contributing 38%. Hence, renewable energy accounted for 38.6% of the total supply in May 2024

A total of 1,659.96GWh of electricity was supplied to the Regulated Market in May 2024 whilst the De-regulated Market and export were supplied with 137.45GWh and 196.94GWh respectively.

A total of 128.32GWh of electricity was supplied to the Export Market in May 2024 which was higher than 115.7GWh recorded in April 2024. Supply to the Export Market reduced in April & May 2024 as compared to the average supply in the first quarter of the year. Electricity export to CIE in May 2024 was 13.03GWh which was lower than the 13.91GWh recorded in April 2024. Export to CEB in May 2024 was 36.47GWh which was higher than 30.71GWh recorded in April 2024. Furthermore, electricity exported to SONABEL was 78.81GWh and was higher than the 71.08GWh supplied in April 2024.

HYDRO DAM LEVELS

Akosombo Dam water level drop rate increases in May 2024

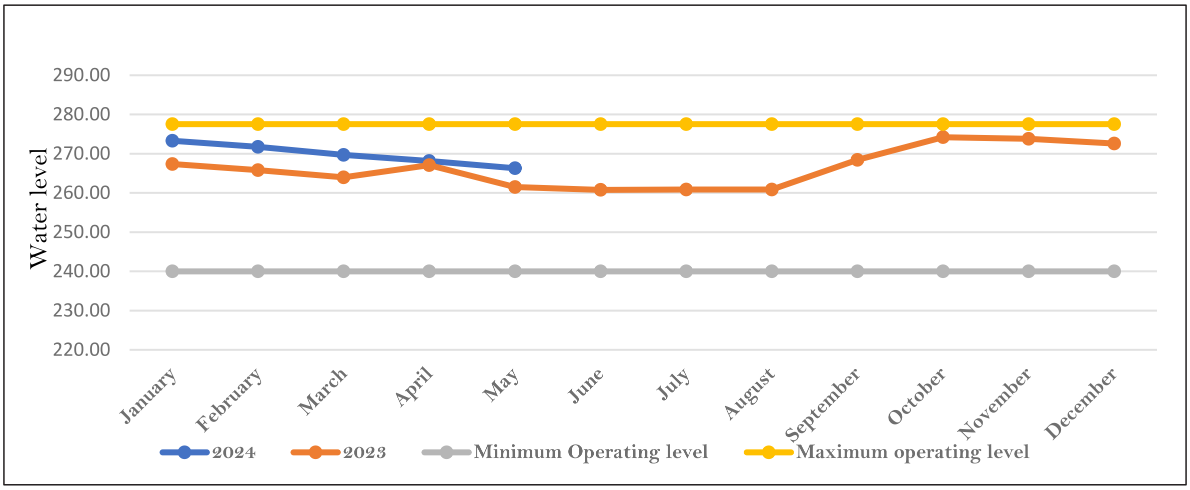
The Akosombo dam's water level rate of drop increased from 0.06ft per day in April 2024 to 0.06ft per day in May 2024. The drop rate in the dam's water level represented a 20% increase in May 2024 compared to April 2024.

In addition, the water level of 268.15ft recorded at the beginning of the month dropped by 1.85ft to 266.30ft at the end of the month. At the end of May 2024, the water level recorded was 4.8ft higher than what was recorded in same period in 2023. The dam water level at the end of the month was 26.3ft above the minimum water level and 11.24ft below the maximum operating level

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

OVERVIEW OF THE MONTH

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



Bui dam water level continued to decrease in May 2024

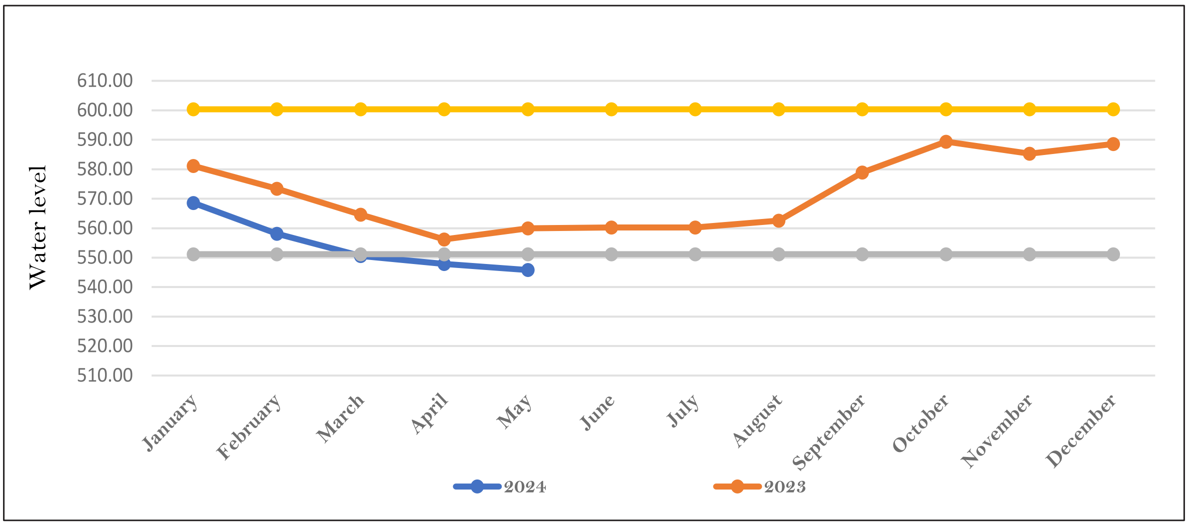
Bui dam water level continued to drop in May 2024. The water level dropped from 547.87ft at the beginning of the month to 545.8ft at a rate of 0.07ft at the end of the month. The drop rate has reduced from 0.09 ft per day in April 2024 to 0.07 ft per day in May 2024.

From the beginning of the first quarter of 2024 through to May 2024, the Bui dam water level constantly dropped at an increased rate as compared to the drop rate in 2023.

In May 2024, the month-end water level recorded was 14.1ft lower than what was recorded in the same period in 2023. The water level for the Bui dam was 5.4ft below the minimum operating level of the power plant.

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

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



FUEL SUPPLY FOR POWER GENERATION

Imports of natural gas increased in May 2024

The supply of natural gas from Nigeria through the West African gas pipeline increased in May 2024 from 51.15MMSCd in April 2024 to 70.34MMSCFd in May 2024. This depicts a 37.5% increase in the supply of imported natural gas. In the total fuel mix, gas imports accounted for an average of 15.9% and 16.3% in the gas supply mix.

Natural gas supply from domestic sources reduced in May 2024

The average natural supply for May 2024 was 260.07MMSCd, the amount recorded was lower than the 263.84MMSCd recorded in April 2024. This conveys a 1.42% decrease in the domestic supply of natural gas for the thermal power plant. On the whole, natural gas from domestic sources accounted for 80% of the total fuel mix and 82.5% of the gas supply mix.

Liquid fuel consumed increased in May 2024

In May 2024, liquid fuel increased with a consumption of 63,866bbls. The liquid fuel consumption is made up of 37,0116bbls DFO and 26,855bbls HFO. There was no consumption of LCO. On average, liquid fuel consumed accounted for 3.0% of the total fuel mix. Additionally, DFO accounted for 55% of the total liquid mix whilst HFO accounted for 45%. The plants responsible for the consumption of liquid fuels, DFO & HFO, in May 2024 were KTPP, AKSA and Cenpower.

Monthly Market Data Analysis

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

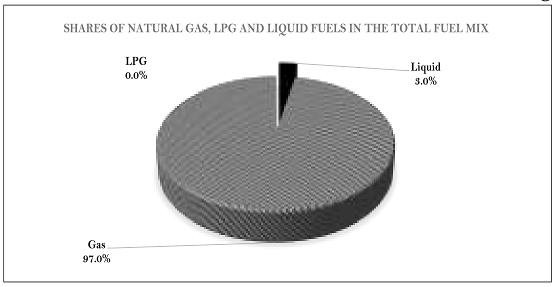


Figure 3b: Shares of fuel types in the generation fuel mix of power generation

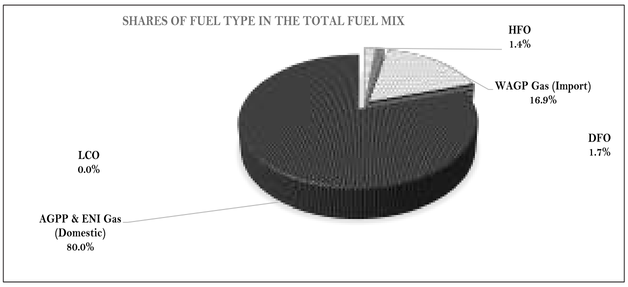


Figure 4a: Contribution of Natural Gas Supply by sources

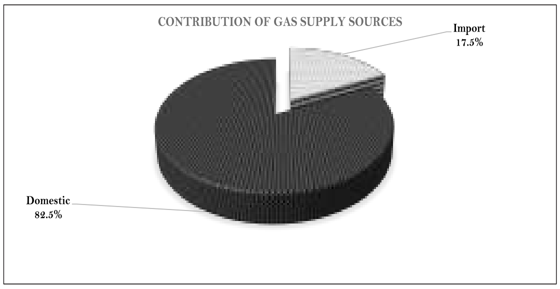


Figure 4b: Contribution of individual fuel in the liquid fuel supply

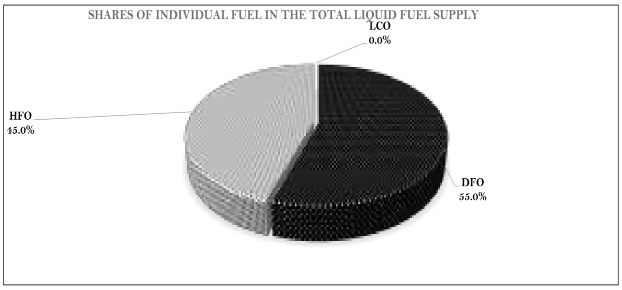


Figure 5a: Electricity Supply by sources

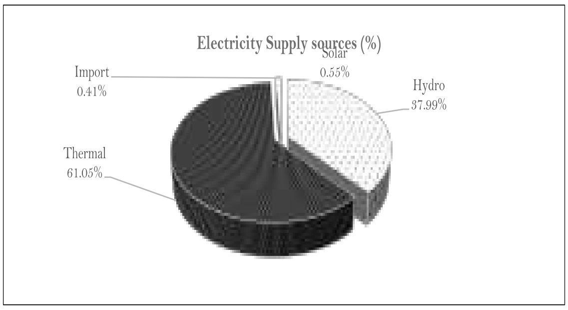
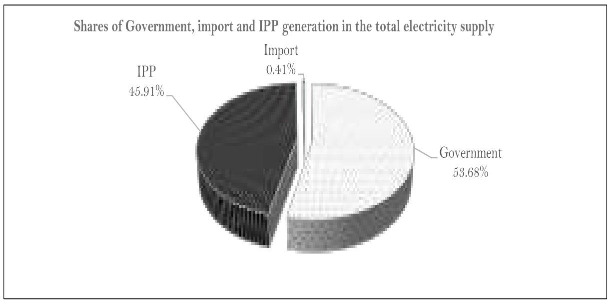


Figure 5b: Electricity supply by ownership



Peak Electricity Supply for May 2024		
Source of Supply	**Generation at System Peak Load (MW)**	**Generation at Ghana Peak Load (MW)**
AKOSOMBO	973.50	951.70
KPONG	117.00	140.00
BUI	183.70	181.00
BUI Solar	-	-
SEAP	522.30	343.50
TAPCO	252.00	254.00
TICO	214.00	210.00
TT1PP	100.00	102.00
CENIT	-	-
TT2PP	-	-
TWIN CITY	173.90	174.70
KARPOWER	351.80	354.70
AMERI	107.30	97.90
KTPP	90.00	192.00
Trojan Power	-	-
CENPOWER	163.00	-
AKSA	234.00	202.10
Bridge Power	-	197.50
IMPORT	-	10.00
Export to CIE at peak	30.00	-
Export to CEB at peak	44.00	39.00
Export to Sonabel	91.00	91.00
System Coincident Peak Load	**3,500.90**	
Ghana Coincedent Peak Load		**3,347.00**

OPERATIONAL FACT SHEET

May 2024 Average Monthly Natural Gas Flowrate (MMSCFD)	
Location	Monthly Average
Etoki	69.44
Tema WAGPCo	139.68
Aboadze WAGPCo	170.99
Aboadze GNGC	88.90
Reverse Flow	67.07
ENI	242.77

Hydro Dam Water level for May 2024			
	Beginning month (ft)	End month (ft)	Change in water level
Hydro Dam			(feet)
Akosombo	268.15	266.30	-1.85
Bui	547.87	545.80	-2.07

	Weekly Electricity Supply (GWh)				
	Week 1	Week 2	Week 3	Week 4	Total
AKOSOMBO	149.42	151.61	152.14	208.85	662.02
KPONG	23.85	20.66	23.04	33.88	101.42
BUI Hydro	7.19	8.08	7.67	9.29	32.23
Bui Solar	7.19	8.08	7.67	9.29	32.23
VRA Kaleo	0.93	1.01	0.80	1.22	3.97
SAPP	69.00	54.00	50.37	83.36	256.72
TAPCO	42.38	41.91	42.21	52.01	178.50
TICO	28.79	28.87	34.79	51.17	143.61
TT1PP	11.35	16.45	16.46	23.30	67.56
CENIT	0.00	0.00	0.00	0.00	0.00
TT2PP	0.00	0.00	0.00	0.00	0.00
Twin City	27.22	28.19	28.01	20.83	104.25
KARPOWER	39.86	37.30	36.05	36.63	149.84
AMERI	21.30	22.72	20.85	31.37	96.23
KTPP	16.99	16.54	18.48	18.80	70.81
Cenpower	22.20	27.47	17.97	28.92	96.56
AKSA	10.47	19.01	10.89	13.99	54.37
Bridge Power	4.42	0.17	7.01	26.97	38.58
Import	2.00	2.27	1.30	3.10	8.67
Total	484.54	484.33	475.70	653.00	2,097.56

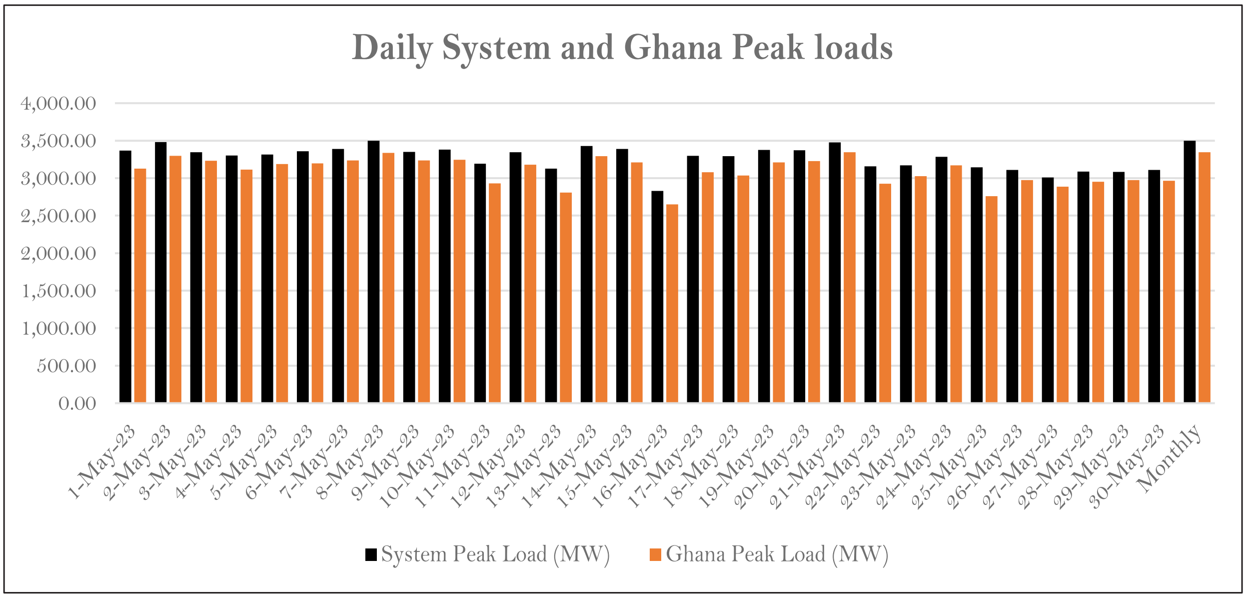
		Fuel Consumption (MMBtu)			
	Heat rate (Btu/kWh)	Natural gas	LCO	HFO	DFO
TAPCO	10,487.10	1,871,978.92	-	-	-
TICO	11,177.84	1,605,297.88	-	-	-
SAPP	8,164.92	2,096,130.69	-	-	-
TT2PP	-	-	-	-	-
TT1PP	13,950.33	942,414.83	-	-	-
CENIT	-	-	-	-	-
KARPOWERSHIP	8,173.76	1,224,765.55	-	-	-
AMERI PLANT	10,112.20	973,096.88	-	-	-
KPONE THERMAL	11,709.97	772,033.95	-	-	57,184.24
CENPOWER	8,177.55	661,818.32	-	-	127,797.98
AKSA ENERGY	8,529.63	301,106.03	-	162,610.00	-
Twin City	7,990.55	833,033.88	-	-	-
Bridgepower	-	-	-	-	-

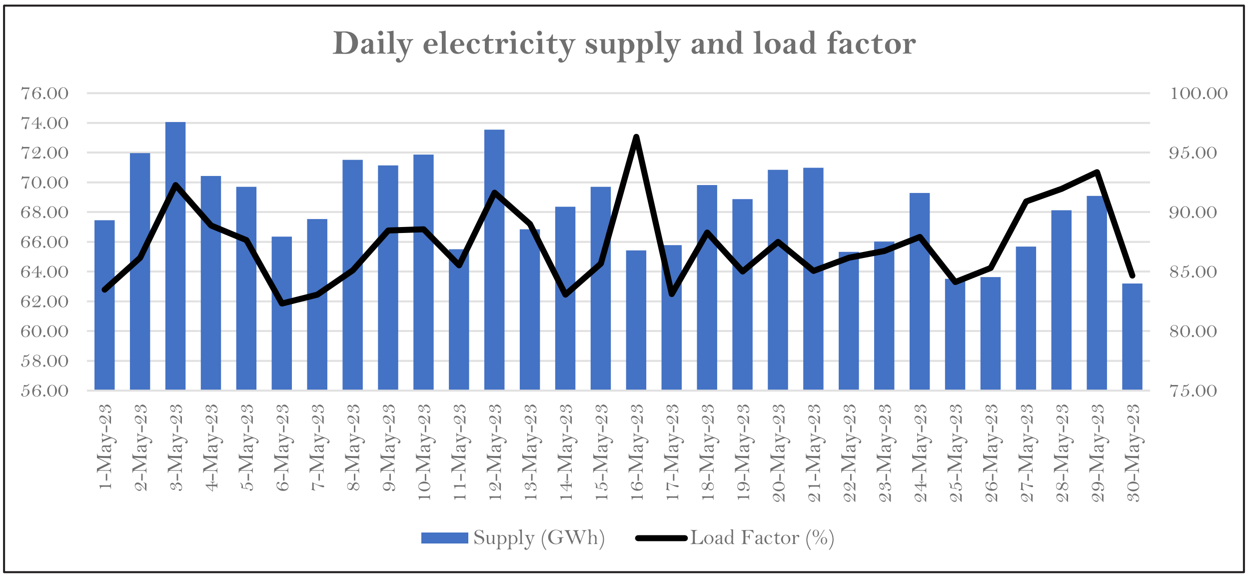
Monthly Average Electricity Prices in the WEM				
		May-24	Apr-23	Change
Average Market Price (AMP)	US$/MWh	128.23	153.90	-25.67
System Marginal Cost (SMC)	US$/MWh	129.01	250.64	-121.63
System Marginal Price (SMP)	US$/MWh	146.79	269.41	-122.62

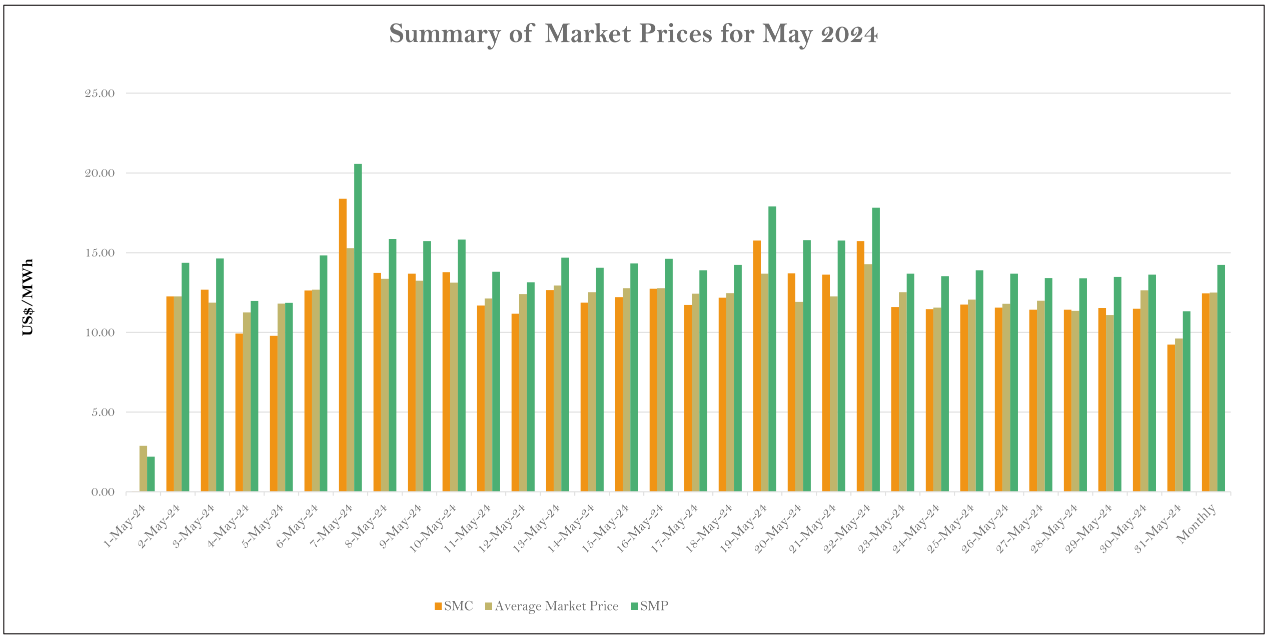
	Month Average fuel prices				
	Gazetted Natural Gas Price	LCO	HFO	DFO	LPG
US$/MMBtu	8.0422	15.21	14.98	27.31	17.96

OPERATIONAL FACT SHEET

Power Plants	Average fuel price (US$/MMBtu)
TAPCO	8.04
TICO	8.04
SAPP	8.04
TT2PP	0.00
TT1PP	8.04
CENIT	0.00
KARPOWERSHIP	8.04
AMERI PLANT	8.04
KPONE THERMAL	9.42
CENPOWER	11.27
AKSA ENERGY	10.51
Twin City	8.04
Bridgepower	0.00






Summary of Market Prices for May 2024
US$/MWh
25.00
20.00
15.00
10.00
5.00
0.00
1-May-24
2-May-24
3-May-24
4-May-24
5-May-24
6-May-24
7-May-24
8-May-24
9-May-24
10-May-24
11-May-24
12-May-24
13-May-24
14-May-24
15-May-24
16-May-24
17-May-24
18-May-24
19-May-24
20-May-24
21-May-24
22-May-24
23-May-24
24-May-24
25-May-24
26-May-24
27-May-24
28-May-24
29-May-24
30-May-24
31-May-24
Monthly
SMC
Average Market Price
SMP

EMOP Secretariat
EMOP Administrator,
Energy Commission, Accra
GPS: GA-037-3212

0302 - 813 - 756/7

emop@energycom.gov.gh
www.energycom.gov.gh/emop

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*

For any enquiries please contact the:
EMOP Secretariat, Energy Commission, Accra.
Tel: 0302 813756/7/9 **E-mail:** emop@energycom.gov.gh