GHANA WHOLESALE ELECTRICITY MARKET BULLETIN

MARKET WATCH

Monthly Market Data Analysis

ISSUE NO. 94 1st April 2024 to 30st Aptil 2024

This Bulletin covers major developments in the Wholesale Electricity Market (WEM) of Ghana from 1st April, 2024 to 30th April, 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 April 2024 was 3,603.90MW which was higher than the 3,487.40MW recorded the same period as 2023. The System Peak Load recorded was made up of 3,348.90MW of the domestic demand and 255MW of Export demand. The Ghana Peak Load, which is Ghana's System demand excluding export for April, 2024 was 3,478.70MW which was higher than 3,192.40MW recorded in April 2023.

The electricity supply averaged 68.3GWh per day in April 2024 and this value was greater than the 66.7GWh per day recorded in April 2023. A total of 2,047.86GWh was supplied in April,2024 which was higher than the 1,999.82GWh recorded the same period as 2023. Electricity Export to our neighboring countries for the month totaled 103.7GWh and it was lower than the 203.6GWh recorded in April 2023.

The Regulated Market accounted for 83.4%, the De-regulated Market accounted for 6.8% of electricity purchased in the Ghana wholesale electricity market in April 2024 whilst the Export Market accounted for the rest.

The Akosombo Dam water level decreased in April 2024. The water level decreased from 269.69ft at the beginning of the month to 268.15ft at the end of April 2024 at a rate of 0.05ft per day in April 2024.

The water level for the Bui dam at the beginning of the month was 550.56ft which decreased at a rate of 0.08ft per day at the end of the month of April 2024 at a water level of 547.87 ft.

Table 1. Projected and Actual Outturn of Electricity Demand and Supply in March 2024 and April 2024.

	Apr-23	Apr-24
	Actual	Actual
Total Supply (GWh)	1,999.8	2,047.86
Source by Power Plants (GWh)		
AKOSOMBO	589.8	649.29
KPONG	97.1	103.92
BUI	140.7	41.55
BUI Solar	7.3	7.60
Kaleo	3.7	4.04
Sunon Asogli	226.5	253.77
TAPCO	88.2	166.02
TICO	177.5	125.82
TT1PP	43.6	40.47
CENIT	5.2	-
TT2PP	3.4	-
Twin City	137.4	100.11
KARPOWER	228.1	235.73
AMERI	-	31.22
KTPP	30.5	66.12
GENSA		16.70
CENPOWER	174.6	102.28
AKSA	37.4	36.00
Bridge Power	-	58.37
Total Domestic Supply (GWh)	1,990.9	2,038.98
Imports (GWh)	8.9	8.87
Total Supply (GWh)	1,999.8	2,047.86
Ghana Coincedent Peak Load (MW	3,192.4	3,478.70
System Coincident Peak Load (MW	3,487.4	3,603.90

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 plant was 97.8%. Natural gas remains the single point of failure in electricity generation in Ghana that needs serious attention in ensuring continuous supply.

ELECTRICITY TRADING

Electricity Demand

The System Peak Load for April 2024 was 3,603.90MW as compared to 3,485.10MW in March 2024. This was 3.4% higher than what was recorded in March, 2024. This increase is attributable to the increase in the domestic load.

The Ghana Peak Load increased in April 2024 compared to March 2024. The Ghana Peak Load increased by 7.8% from 3,226.50MW to 3478.70MW in April 2024. The load factor for April 2024 was 78.92%

Electricity export at the System Peak Load to CIE, CEB and SONABEL for April, 2024 was 255MW. This was made up of 57MW, 57MW, 141MW for CIE, CEB and SONABEL respectively. The decrease in export demand at the System Peak from March, 2024 to April 2024 was attributable to the decrease in export to SONABEL and CEB.

The average electricity demand for April 2024 was 2,705.18MW whilst the average electricity demand for March 2024 was 2,764.31MW. The average electricity demand decreased in April 2024.

The average electricity demand for regulated market in April 2024 was 2,256.3MW. This may be attributable to the weather conditions that necessitated the need for cooling in April 2024. For the regulated markets, ECG accounted for 85.9% of the average demand whilst NEDCO and enclave power accounted for an average of 12.0% and 1.5% respectively. VRA Township accounted for the rest.

The average demand for the de-regulated market was 186.24MW for April 2024. The Mines accounted for 82.8% whilst bulk customers accounted for 17.1% of the de-regulated market demand. Export markets recorded an average demand of 254.52MW. Export to neighboring countries accounted for 63.1% of for demand whilst VALCO accounted for 36.8%.

Electricity supply

A total of 2,047.86GWh of electricity was supplied in April 2024 which was lower than the 2,152.24GWh supplied in March 2024. Electricity supply averaged 68.26GWh per day marginally lower than the 69.43GWh supplied in March 2024. In addition, domestic supply accounted for 99.6% of the total generation while inadvertent imports from CIE accounted for 0.4%.

Electricity supplied by thermal plants in April 2024 constituted 60.19% of the total electricity supplied. The contribution of electricity supplied from the solar power plant is 0.57 % whilst hydro accounted for 38.81 %. Hence, renewable energy accounted for 39.38% of the total supply in April 2024. Thermal Plants had a larger share in the electricity mix.

A total of 1,624.54GWh of electricity was supplied to the Regulated Market in April 2024 whilst de-regulated market and export were supplied with 134.09GWh and 183.25GWh respectively.

A total of 103.7GWh of electricity was supplied to the export market in our neighboring countries in April 2024. Electricity export to CIE was 13.91GWh which was lower than the 11.55GWh recorded in March 2024. Export to CEB in April 2024 was 30.71GWh which was rather lower than what was recorded in March 2024. SONABEL's share of electricity exported was 71.08GWh which was lower than the 109.207GWh recorded in March 2024.

HYDRO DAM LEVELS

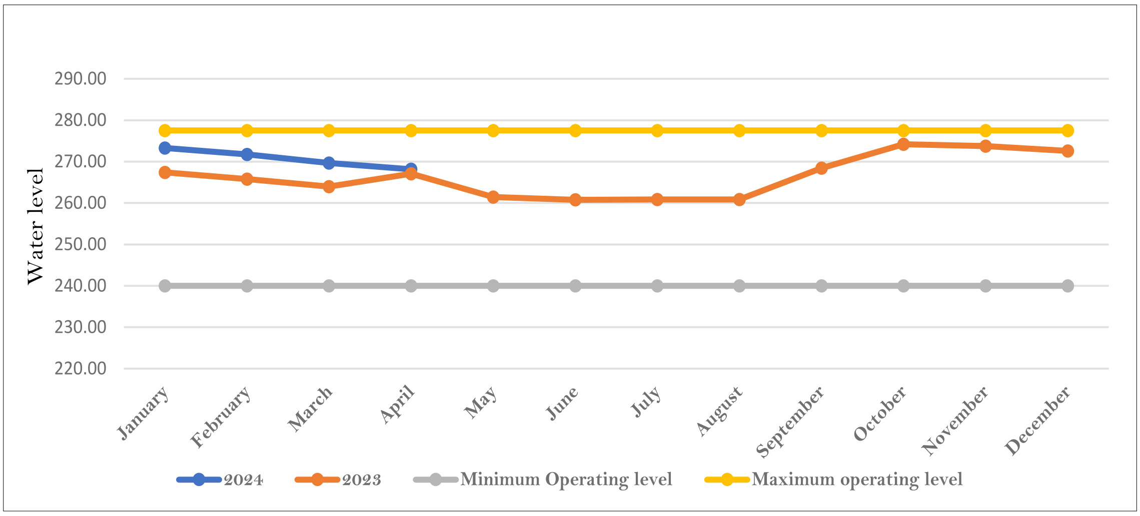
Akosombo water level continued to decline in April 2024

The rate of drop in the water level for Akosombo GS continued to decline in April 2024. The rate of drop decreased to 0.05 ft per day in April 2024 from 0.06ft in March 2024. This showed a 16% decrease in the rate of drop. Having that, the water level of 269.69 ft recorded at the beginning of the month dropped by 1.54 ft to 268.15ft at the end of the month.

During the same period in 2023, the month end water level of the Akosombo dam recorded a water level of 267.08ft. Comparatively to April, 2024, the water level at the end of the month was 268.15ft which showed a 1.07ft increase.

The end- month water level was 28.15ft above the minimum operating level and 9.39ft below the maximum operating level of the dam in April 2024.

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



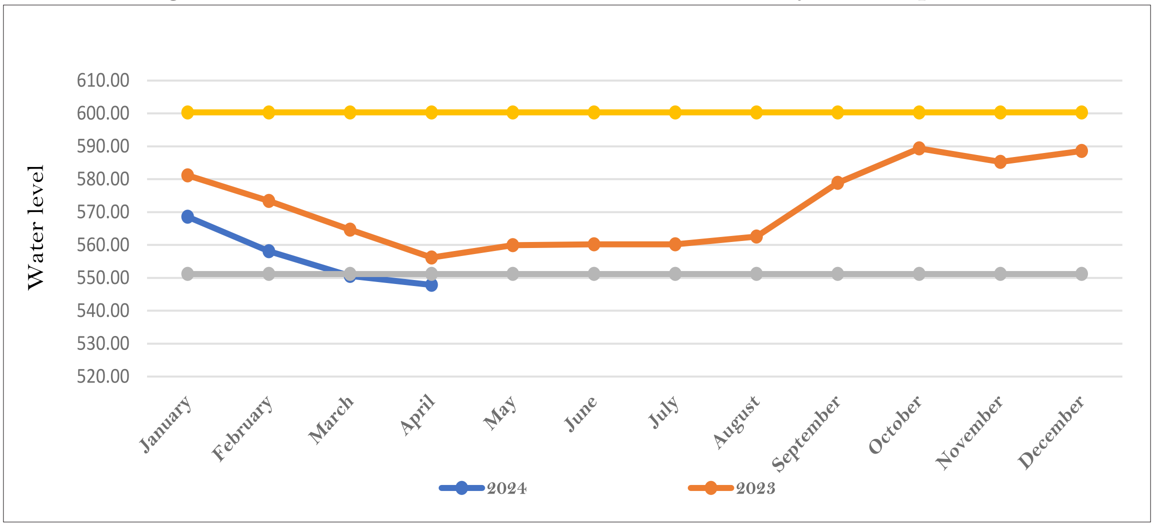
Bui Dam water level continued to decrease in April, 2024

The Bui dam water level continued to decrease from January 2024 through to April 2024.

In April, 2024, 550.56ft was recorded at the beginning of the month which ended the month with a water level of 547.87ft. This showed a 2.69 ft decrease in water level. Also the water level decreased at a rate of 0.089ft per day.

Additionally, the month end water level recorded in 2024 was 8.3ft lower than what was recorded in 2023. However, the dam recorded 3.31ft below the minimum operating level of the dam and 52.47 below maximum operating level.

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



FUEL SUPPLY FOR POWER GENERATION

Natural Gas imports decreased in April, 2024

The supply of natural gas from Nigeria through the West African gas pipeline declined from 73.6MMSCFD in March, 2024 to 51.15MMSCFD in April 2024. This depicts a 43.9% decrease. On the average, gas imports accounted for 15.9% in the total fuel mix and 16.3% in the gas supply mix.

Natural gas supply from domestic sources increased in April 2024

The average natural gas supply for April, 2024 was 263.65MMSCFD which was higher than the average gas supply of 242.95MMSCFD in March, 2024.This indicates 8.5% increase. On the average natural gas from domestic sources accounted for 82.3% in the total fuel mix and 82.3% in the gas supply mix

Consumption of liquid fuel decreased in April, 2024

In April, 2024 liquid fuel consumption was recorded as 41,837bbls made up of 27,191bbls DFO and 14,645bbls HFO. On the average, liquid fuel accounted for an average of 2.2% in the total fuel mix. DFO accounted for 62.3% of the total liquid mix whilst HFO accounted for 37.8%. The plants responsible for the consumption of liquid fuels, HFO and DFO, in April, 2024 were Cenpower, AKSA and KTPP respectively.

Monthly Market Data Analysis

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

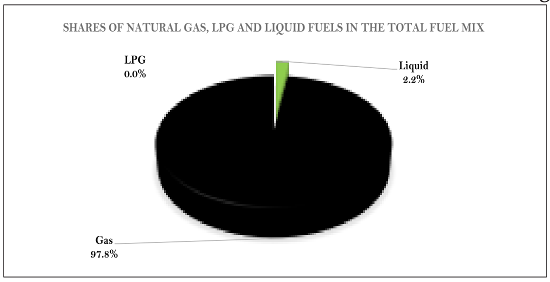


Figure 3b: Shares of fuel types in the generation fuel mix of power generation

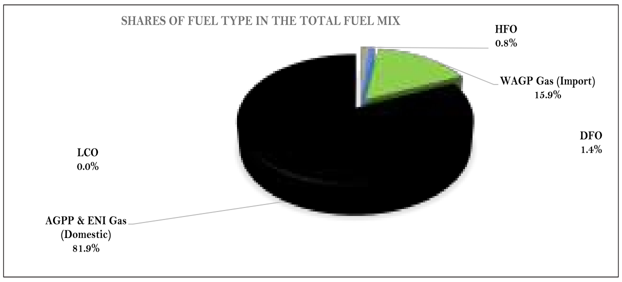


Figure 4a: Contribution of Natural Gas Supply by sources

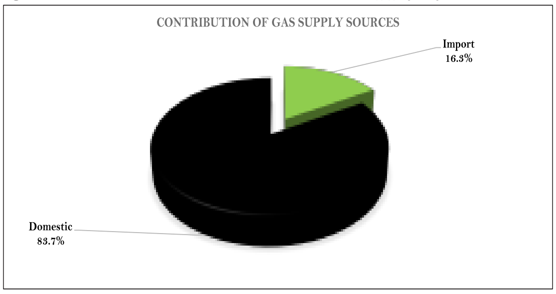


Figure 4b: Contribution of individual fuel in the liquid fuel supply

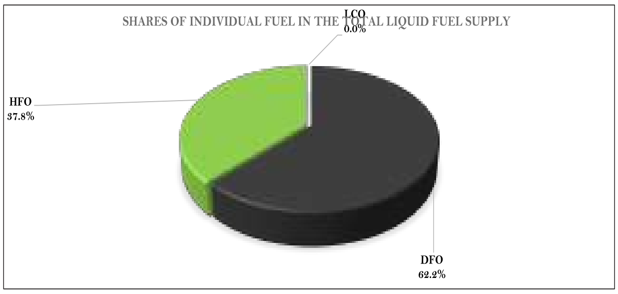


Figure 5a: Electricity Supply by sources

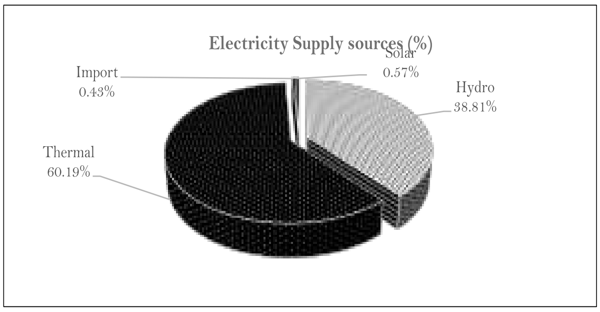
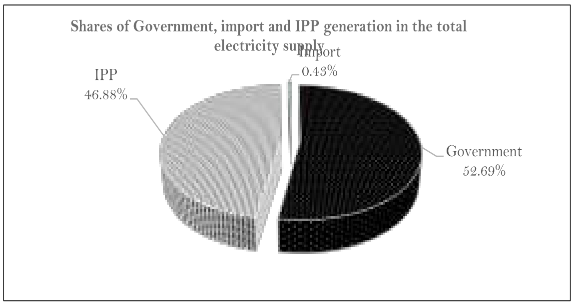


Figure 5b: Electricity supply by ownership



Peak Electricity Supply for April 2024		
Source of Supply	**Generation at System Peak Load (MW)**	**Generation at Ghana Peak Load (MW)**
AKOSOMBO	936.60	936.20
KPONG	146.00	147.00
BUI	180.00	181.00
BUI Solar	-	-
SEAP	508.10	456.00
TAPCO	254.00	258.00
TICO	213.00	218.00
TT1PP	-	101.00
CENIT	-	-
TT2PP	-	-
TWIN CITY	155.20	159.70
KARPOWER	461.00	348.50
AMERI	132.60	90.90
KTPP	203.00	197.00
Trojan Power	-	-
CENPOWER	279.00	284.00
AKSA	119.10	202.40
Bridge Power	-	-
IMPORT	-	3.00
Export to CIE at peak	57.00	-
Export to CEB at peak	57.00	32.00
Export to Sonabel	141.00	92.00
System Coincident Peak Load	**3,603.90**	
Ghana Coincedent Peak Load		**3,478.70**

OPERATIONAL FACT SHEET

March 2024 Average Monthly Natural Gas Flowrate (MMSCFD)	
Location	Monthly Average
Etoki	60.00
Tema WAGPCo	148.93
Aboadze WAGPCo	161.52
Aboadze GNGC	91.84
Reverse Flow	86.86
ENI	225.84

	Month Average fuel prices				
	Gazetted Natural Gas Price	LCO	HFO	DFO	LPG
US$/MMBtu	8.0422	17.09	16.22	19.08	8.99

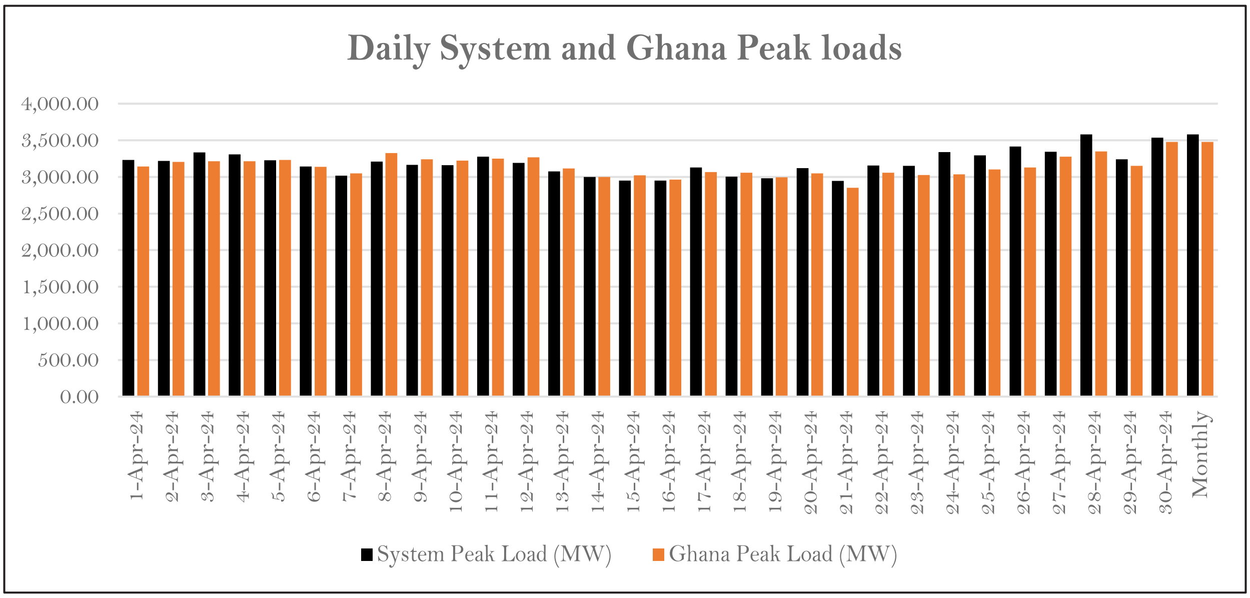
Monthly Average Electricity Prices in the WEM				
		Apr-24	Mar-24	Change
Average Market Price (AMP)	US$/MWh	123.06	88.15	34.91
System Marginal Cost (SMC)	US$/MWh	246.11	87.77	158.34
System Marginal Price (SMP)	US$/MWh	143.95	109.59	34.36

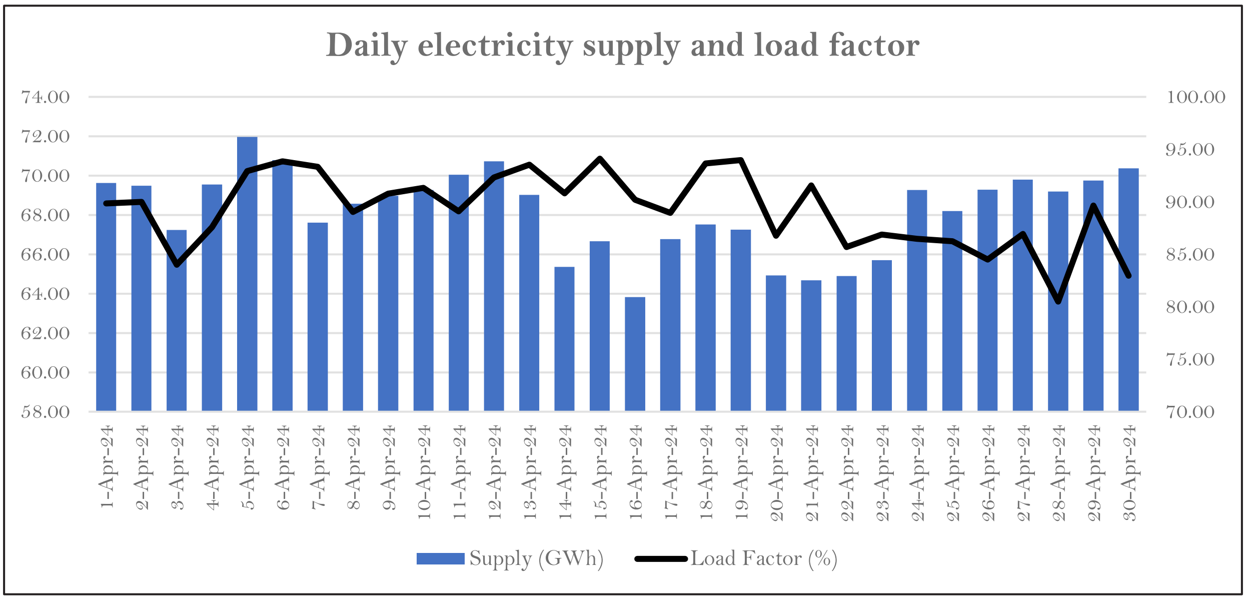
Power Plants	Average fuel price (US$/MMBtu)
TAPCO	8.04
TICO	8.04
SAPP	8.04
TT2PP	0.00
TT1PP	8.04
CENIT	0.00
KARPOWERSHIP	8.04
AMERI PLANT	8.04
KPONE THERMAL	9.19
CENPOWER	8.96
AKSA ENERGY	10.37
Twin City	8.04
Bridgepower	0.00

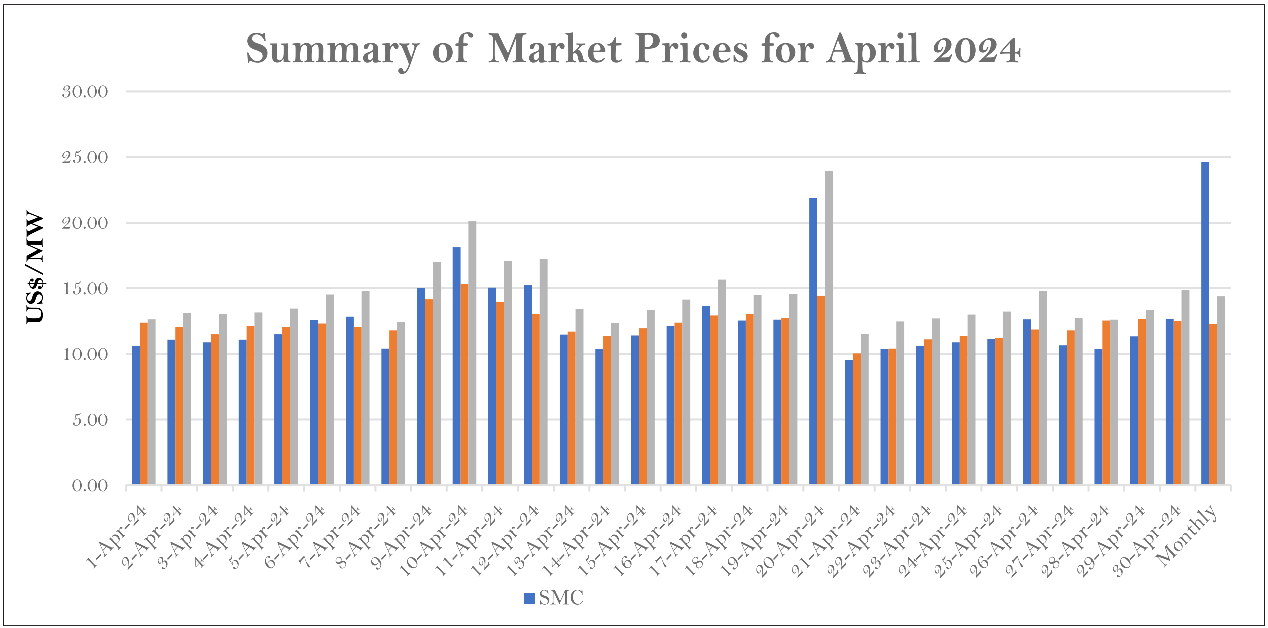
	Weekly Electricity Supply (GWh)				
	Week 1	Week 2	Week 3	Week 4	Total
AKOSOMBO	152.38	152.73	152.29	212.41	669.82
KPONG	24.29	23.72	24.40	34.98	107.40
BUI Hydro	15.36	9.62	7.12	10.39	42.49
Bui Solar	1.90	1.55	1.87	2.50	7.82
VRA Kaleo	0.90	0.90	0.99	1.37	4.16
SAPP	58.92	64.72	57.57	81.24	262.45
TAPCO	34.13	40.79	41.26	55.95	172.13
TICO	20.28	25.89	34.29	50.49	130.96
TT1PP	16.97	13.05	0.00	11.60	41.62
CENIT	0.00	0.00	0.00	0.00	0.00
TT2PP	0.00	0.00	0.00	0.00	0.00
Twin City	12.19	30.70	30.24	30.68	103.82
KARPOWER	67.56	51.33	45.46	76.95	241.30
AMERI	0.00	0.00	7.22	26.30	33.52
KTPP	9.10	11.70	20.14	27.65	68.59
Cenpower	34.22	35.73	19.83	16.78	106.55
AKSA	9.99	7.59	6.09	13.75	37.41
Bridge Power	22.43	5.34	7.06	23.53	58.37
Import	1.43	1.89	1.60	2.51	7.43
Total	482.06	477.26	457.44	679.08	2,095.83

OPERATIONAL FACT SHEET

		Fuel Consumption (MMBtu)			
	Heat rate (Btu/kWh)	Natural gas	LCO	HFO	DFO
TAPCO	10,423.93	1,794,282.07	-	-	-
TICO	10,739.93	1,406,452.89	-	-	-
SAPP	7,727.64	2,028,126.61	-	-	-
TT2PP	-	-	-	-	-
TT1PP	12,464.09	518,693.19	-	-	-
CENIT	-	-	-	-	-
KARPOWERSHIP	7,944.97	1,917,116.58	-	-	-
AMERI PLANT	9,387.01	314,669.40	-	-	-
KPONE THERMAL	10,913.89	670,792.76	-	-	77,799.83
CENPOWER	7,907.73	772,612.31	-	-	69,981.96
AKSA ENERGY	8,780.87	234,952.34	-	93,509.15	-
Twin City	7,739.84	803,537.93	-	-	0.08
Bridgepower	-	-	-	-	-






Summary of Market Prices for April 2024
US$/MW
30.00
25.00
20.00
15.00
10.00
5.00
0.00
1-Apr-24
2-Apr-24
3-Apr-24
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2020-2022 REPORT

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