# GHANA WHOLESALE ELECTRICITY MARKET BULLETIN

# MARKET WATCH

Monthly Market Data Analysis

**ISSUE NO. 93** **1st March 2024 to 31st March 2024**

This Bulletin highlights significant changes in Ghana's Wholesale Electricity Market (WEM) from March 1 to March 31, 2024. 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 2024, the System Peak Load was 3,485.10MW which was lower than the 3,513.86MW recorded the same period as 2023. The System Peak load made up of 3187.10MW of the domestic demand and 298MW of the Export demand. The Ghana peak load which is Ghana's System demand (excluding export) for March, 2024 was 3226.50MW which was lower than what was recorded in March, 2023.

The electricity supply averaged 69.43GWh per day in March, 2024. This value higher than the 66.25GWh per day recorded in March, 2023. A total of 2,152.24GWh of electricity was supplied in March 2024 which was 4.16% higher than the 2,066.28GWh recorded in March, 2023. Electricity export for the month totaled 167.64GWh which was lower than the 189.63GWh in March, 2023.

The regulated market accounted for 81.5% of electricity purchased in the Ghana wholesale electricity market in March, 2024. The De-regulated market accounted for 6.6% in March, 2024 while the export market accounted for the rest.

The Akosombo Dam water level continued to dwindle from January 2024 through to March 2024. The water level at the beginning of March, 2024 was 271.68ft, which declined to 269.69 ft at the end of the month at a rate of 0.064feet per day in March, 2024

Bui dam water level for March, 2024 reduced by 1.99ft from the 557.74ft at the beginning of the month to 550.56ft. The water level decreased at a rate of 0.23feet day in March, 2024.

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

| | Mar-23 | Mar-24 |
|---|---|---|
| | Actual | Actual |
| Total Supply (GWh) | 2,070.45 | 2,152.2 |
| Source by Power Plants (GWh) | | |
| AKOSOMBO | 548.02 | 671.4 |
| KPONG | 93.775 | 108.3 |
| BUI | 148.7 | 106.2 |
| BUI Solar | 7.5 | 4.7 |
| Kaleo | 3.0 | 3.8 |
| Sunon Asogli | 261.2847 | 287.4 |
| TAPCO | 165.3 | 143.6 |
| TICO | 248.9 | 81.6 |
| TT1PP | 6.6 | 73.9 |
| CENIT | 19.4 | 0.8 |
| TT2PP | 6.0 | - |
| Twin City | 133.4 | 16.8 |
| KARPOWER | 167.7 | 328.5 |
| AMERI | - | - |
| KTPP | 61.7 | 22.2 |
| GENSA | - | 18.8 |
| CENPOWER | 143.27 | 204.0 |
| AKSA | 52.2 | 54.7 |
| Bridge Power | - | 17.0 |
| Total Domestic Supply (GWh) | 2,066.8 | 2,143.6 |
| Imports (GWh) | 3.7 | 8.6 |
| Total Supply (GWh) | 2,070.4 | 2,152.2 |
| Ghana Coincedent Peak Load (MW | 3,231.9 | 3,226.5 |
| System Coincident Peak Load (MW | 3,513.9 | 3,485.1 |

# 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 in March, 2024 was 97.8%. There is a need at every point in time ensure natural gas supply security as it is one of the biggest threats to stable and reliable electricity supply.

## ELECTRICITY TRADING

### Electricity Demand

The System Peak load for March, 2024 was 3,485.10MW as compared to 3,454.92MW in February, 2024 which was 0.9% higher than what was recorded in February, 2024. This increase is attributable to the increase in domestic Peak load in March, 2024. For the 1st quarter of 2024, Ghana attained its System Peak Load in March, 2024. The System Peak Load increased by an average of 2.6% between January and March, 2023.

The Ghana Peak Load declined by 0.5% in March 2024 from February, 2024. The Ghana Peak load for February, 2024 was 3,242MW and it declined to 3,226.50MW in March, 2024. The Load factor for March 2024 was 83%. In the first quarter of 2024, the Ghana Peak Load reached its peak in February, 2024 of 3,242MW.

Electricity export at the System Peak Load to CIE, CEB and SONABEL was 298MW in March, 2024 which was a 19.2% decrease in export compared to February, 2024.

Electricity export at the System Peak Load in March, 2024 was made up of 44MW and 80MW for CEB and174MW for SONABEL respectively. This increase in export demand from February 2024 to March 2024 is attributable to an increase in export demand to CIE

The average electricity demand for March, 2024 was 2,764.31MW compared to 2,865.31MW in February, 2024. This represents a 3.5% decrease in average demand for March, 2024 compared to February, 2024

The average electricity demand for regulated market was 2,252.96 MW in March, 2024. For the regulated markets, ECG accounted for 86.1% of the average demand whilst NEDCO and Enclave power accounted for an average of 11.9% and 1.6% respectively. VRA township accounted for 0.4%

The average demand for the de-regulated market was 182.34MW for March, 2024. The mines accounted for 82.7% whilst bulk customers accounted for 17.3% of the de-regulated market demand. Export markets recorded an average demand of 324.9MW for March, 2024. In relation to export to neighboring countries, 71.1% accounted for export demand while VALCO accounted for the rest

### Electricity supply

Electricity supplied decreased in March, 2024 from an average of 71.56GWh per day in February, 2024 to 69.43GWh per day representing a 2.98% decrease.

The total supply for March, 2024 was 2,152.24GWh whilst February 2024 was 2,075.27GWh, due to the greater number of days in March, 2024 than in February, 2024, the average per day decreased.

In addition, domestic supply accounted for 99.6% of the total generation while inadvertent imports from CIE accounted for 0.4%. Electricity export for the month of March, 2024 totaled 167.6GWh and this was 11.6% lower than 189.6GWh recorded same period in 2023.

Electricity supplied by thermal plants in March, 2024 constituted 58.04% of the total electricity supplied.

The solar power plant contribution to total electricity supplied was 0.4% while hydro accounted for 41.2%. Thus, renewable energy in February, 2024 account in the total supply was 41.6%.

A total of 1676.20GWh of electricity was supplied to the Regulated Market in March, 2024 which includes ECG, NEDCO, Enclave power and VRA township. ECG accounted for 86.1%, NEDCO accounted for 11.9%, Enclave Power accounted for 1.6% and VRA township accounted for the rest

De-regulated Market and Export Market were supplied with 135.7GWh and 241.8GWh respectively in March 2024.

A total of 171.96GWh of electricity was supplied to our neighboring countries in March, 2024. Electricity export to CIE was 11.6GWh which decreased from 22.3GWh recorded in February, 2024. Besides, export to CEB decreased as well to 51.3GWh from 55.8GWh in March, 2024. The total electricity exported to SONABEL was 109.1GWh

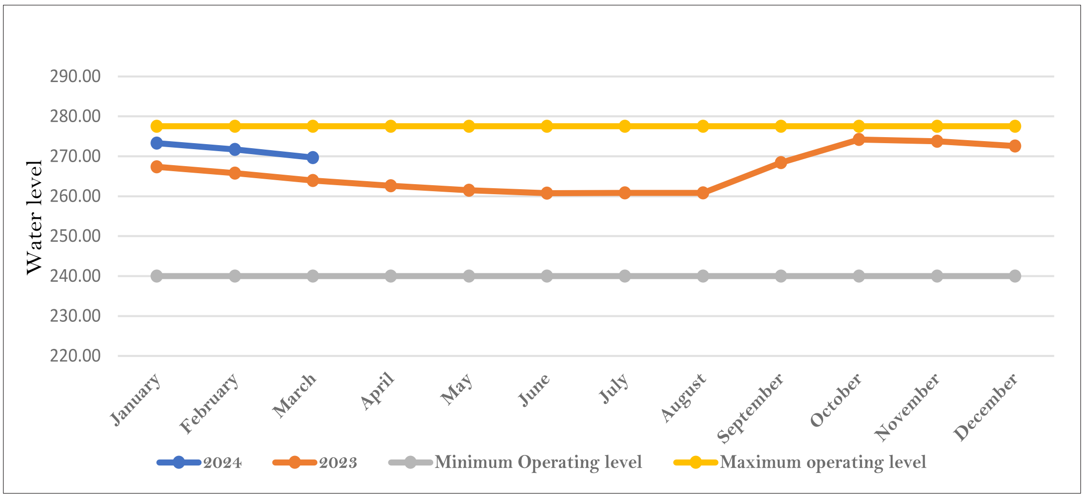
## HYDRO DAM LEVELS

#### Akosombo water level continued to drop in March, 2024

The rate of drop in the Akosombo dam water level increased from 0.05 ft per day in February 2024 to 0.06ft per day in March 2024. This represents a 20% increase in the rate of drop in March, 2024 compared to February, 2024. As a result, the water level of 271.68ft recorded at the beginning of the month dropped by 1.99ft to 269.694ft at the end of the month. The month-end water level was however 5.73ft higher than what was recorded in the same period of the previous year, was 7.85ft below the maximum operating level and 29.69ft above the minimum operating level.

# OVERVIEW OF THE MONTH

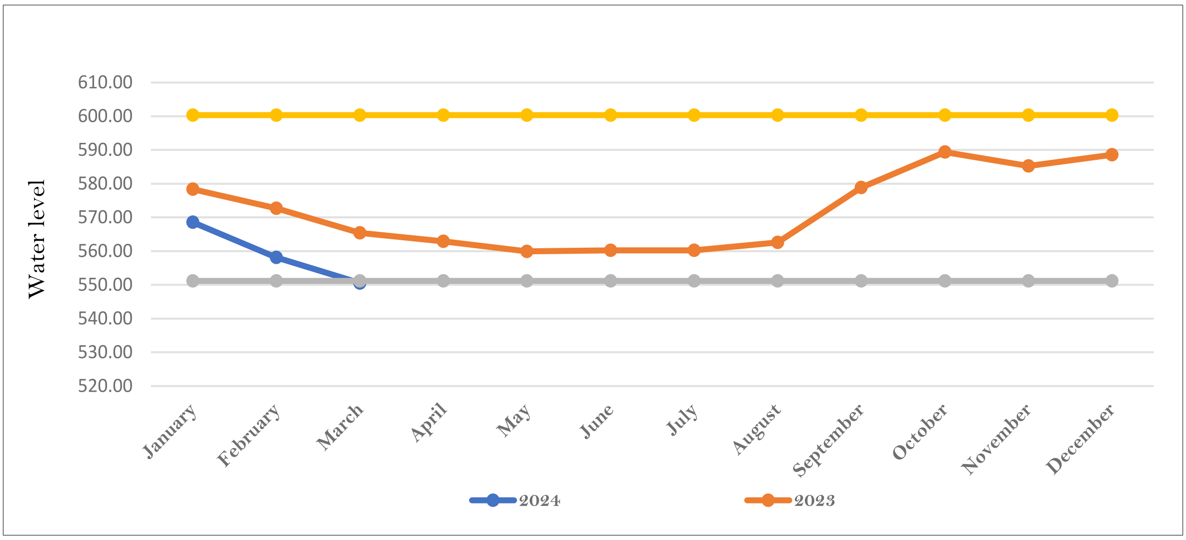
**Figure 1 shows the comparative end-of-month trajectory of the level of water in the Akosombo Dam from January, 2024 to March, 2024**




### Bui dam water level rate of drop remains the same in March 2024

Rate of drop increased in March, 2024 at 0.23 ft per day. Due to the higher number of days in March and February, 2023, the drop in the water level increased from 7.78ft in February 2024 to 7.18ft in March, 2024. As a result, the water level of 557.74ft recorded at the beginning of the month dropped to 550.56ft at the end of March, 2024 which was lower than what was recorded in the same period of 2023. The month end water level of March, 2024 was 14.89ft above the water level recorded for the same period in 2023 and 0.62ft below the minimum operating level of the dam as well as 49.78ft below the maximum operating level.

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




## FUEL SUPPLY FOR POWER GENERATION

### Natural gas imports increased in March, 2024

The supply of natural gas from Nigeria through the West African gas pipeline increased from 52.4MMSCFd in February, 2024 to 73.57MMSCFd in March 2024. This represents a decrease of 40.4%in natural gas imports. On average, gas imports accounted for 23.4% of the total fuel mix and 24.1% in the gas supply mix in March 2024

### Natural gas supply from domestic sources reduced in March 2024

The average natural gas supply for March 2024 was 242.95MMSCFd which was lower than the average gas supply of 249.3MMSCFd for February, 2024. On average natural gas from domestic sources accounted for 73.9% of the total fuel supplied and 75.9% of the gas supply mix

### Consumption of liquid fuel decreased in March 2024

There was a decrease in liquid fuel consumption in March 2024 from 74,963bbls recorded in February 2024 to 50,642 bbls in February 2024. There was no consumption of LCO but 24,452bbls DFO and 26,190bbls HFO. On average, liquid fuel accounted for an average of 2.6% of the total fuel mix. HFO and DFO accounted for 54.7% and 45.3% of the total liquid mix. The plants responsible for the consumption of liquid fuel, HFO and DFO in March, 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**

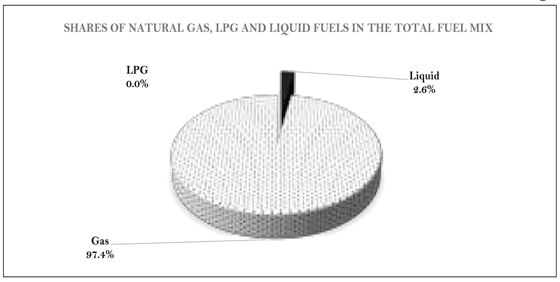



**Figure 3b: Shares of fuel types in the generation fuel mix of power generation**

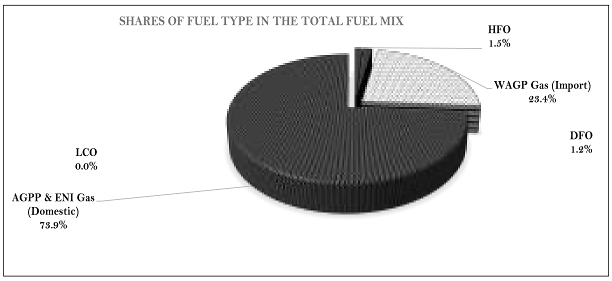



**Figure 4a: Contribution of Natural Gas Supply by sources**

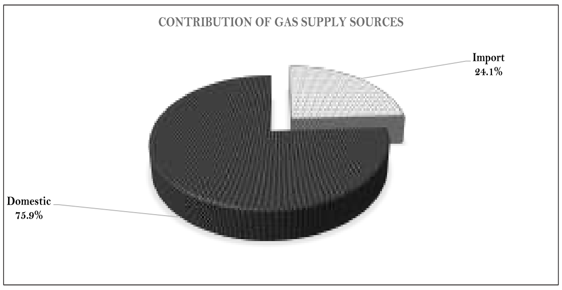



**Figure 4b: Contribution of individual fuel in the liquid fuel supply**

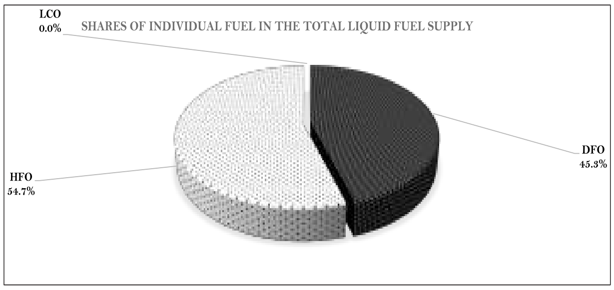



**Figure 5a: Electricity Supply by sources**

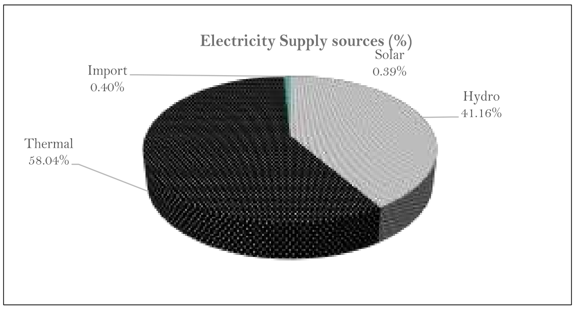
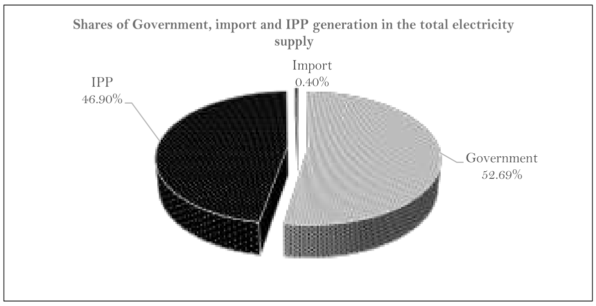



**Figure 5b: Electricity supply by ownership**




| Peak Electricity Supply for March 2024 | | |
|---|---|---|
| Source of Supply | Generation at System Peak Load (MW) | Generation at Ghana Peak Load (MW) |
| AKOSOMBO | 951.80 | 972.20 |
| KPONG | 144.00 | 147.00 |
| BUI | 205.20 | 204.10 |
| BUI Solar | - | - |
| SEAP | 519.50 | 345.30 |
| TAPCO | 207.00 | 307.00 |
| TICO | 111.00 | 113.00 |
| TT1PP | 102.00 | 103.00 |
| CENIT | - | - |
| TT2PP | - | - |
| TWIN CITY | - | - |
| KARPOWER | 461.10 | 460.90 |
| AMERI | - | - |
| KTPP | 203.00 | 100.00 |
| Trojan Power | - | - |
| CENPOWER | 352.00 | 358.00 |
| AKSA | 228.50 | 261.00 |
| Bridge Power | - | - |
| IMPORT | - | 22.00 |
| Export to CIE at peak | 44.00 | - |
| Export to CEB at peak | 80.00 | 67.00 |
| Export to Sonabel | 174.00 | 117.00 |
| System Coincident Peak Load | **3,485.10** | |
| Ghana Coincedent Peak Load | | **3,226.50** |

# OPERATIONAL FACT SHEET

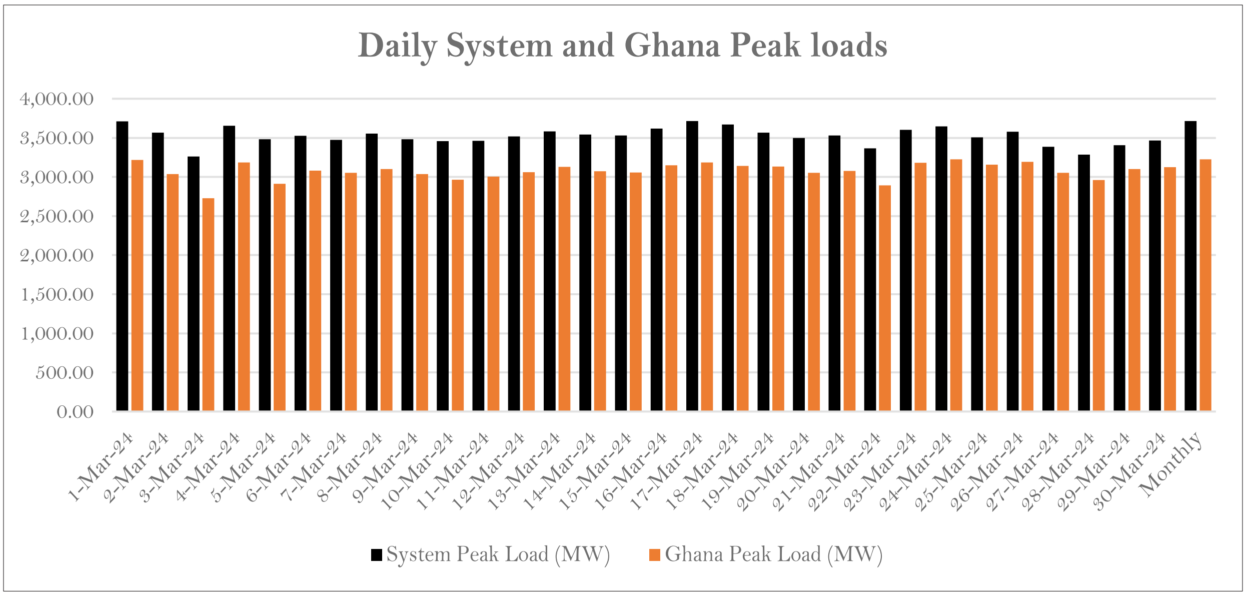
| March 2024 Average Monthly Natural Gas Flowrate (MMSCFD) | |
|---|---|
| Location | Monthly Average |
| Etoki | 60.00 |
| Tema WAGPCo | 148.93 |
| Aboadze WAGPCo | 161.52 |
| Aboadze GNGC | 91.84 |
| Reverse Flow | 86.86 |
| ENI | 225.84 |

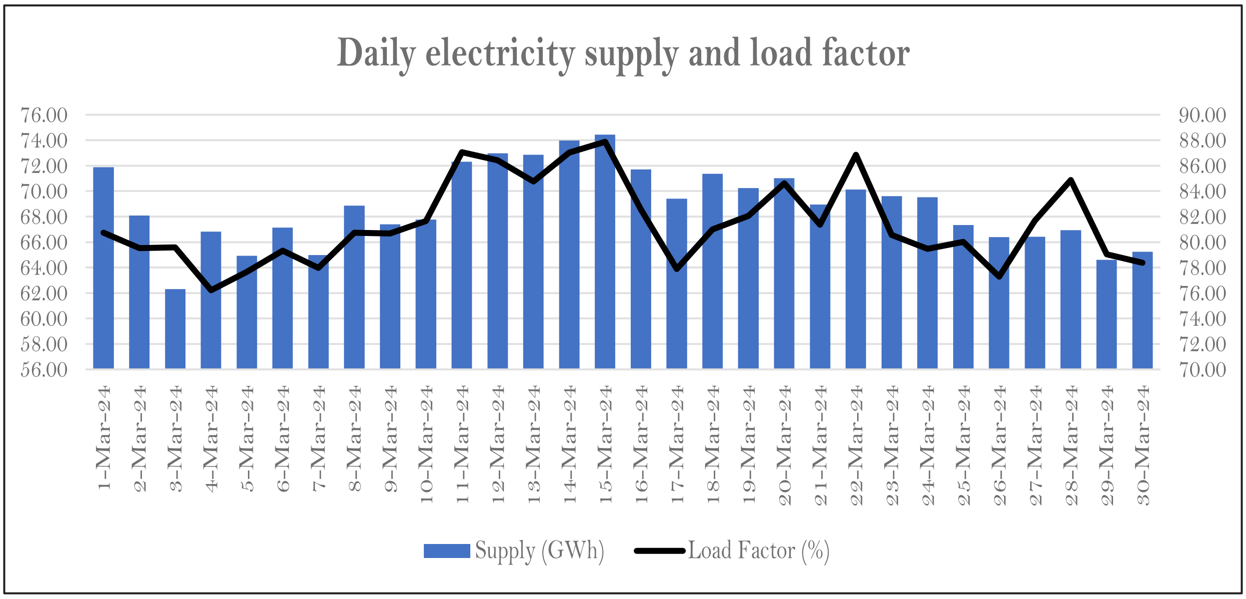
| | Month Average fuel prices | | | | | |
|---|---|---|---|---|---|---|
| | Gazetted Natural Gas Price | Weighted average natural gas price | LCO | HFO | DFO | LPG |
| US$/MMBtu | 6.08 | 6.18 | 15.77 | 15.31 | 32.73 | 17.96 |

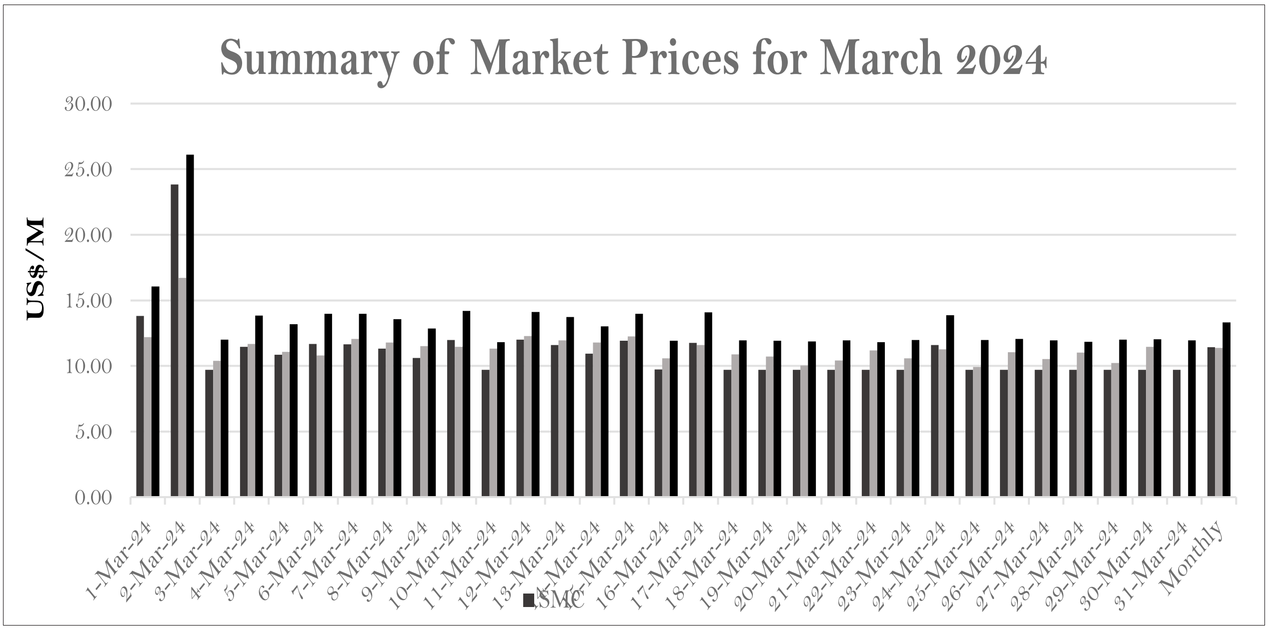
| Power Plants | Average fuel price (US$/MMBtu) |
|---|---|
| TAPCO | 6.08 |
| TICO | 6.08 |
| SAPP | 6.08 |
| TT2PP | 0.00 |
| TT1PP | 6.08 |
| CENIT | 6.08 |
| KARPOWERSHIP | 6.08 |
| AMERI PLANT | 0.00 |
| KPONE THERMAL | 6.54 |
| CENPOWER | 8.13 |
| AKSA ENERGY | 9.16 |
| Twin City | 6.08 |
| Bridgepower | 0.00 |
| Genser | 7.51 |

| | Weekly Electricity Supply (GWh) | | | | |
|---|---|---|---|---|---|
| | Week 1 | Week 2 | Week 3 | Week 4 | Total |
| AKOSOMBO | 147.77 | 153.61 | 152.93 | 217.08 | 671.39 |
| KPONG | 24.77 | 24.72 | 24.49 | 34.32 | 108.30 |
| BUI Hydro | 28.93 | 28.15 | 21.64 | 27.51 | 106.23 |
| Bui Solar | 0.00 | 0.54 | 1.72 | 2.40 | 4.66 |
| VRA Kaleo | 0.88 | 0.88 | 0.84 | 1.23 | 3.83 |
| SAPP | 62.61 | 63.36 | 75.00 | 86.44 | 287.41 |
| TAPCO | 22.45 | 34.70 | 32.46 | 54.01 | 143.62 |
| TICO | 18.61 | 18.94 | 18.10 | 25.95 | 81.60 |
| TT1PP | 17.08 | 17.14 | 16.37 | 23.34 | 73.93 |
| CENIT | 0.82 | 0.00 | 0.00 | 0.00 | 0.82 |
| TT2PP | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Twin City | 16.48 | 0.00 | 0.00 | 0.30 | 16.78 |
| KARPOWER | 73.08 | 74.49 | 74.58 | 106.31 | 328.46 |
| AMERI | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| KTPP | 2.65 | 1.73 | 9.34 | 7.83 | 21.55 |
| Cenpower | 28.16 | 53.31 | 41.27 | 59.68 | 182.42 |
| AKSA | 15.73 | 14.89 | 14.27 | 15.31 | 60.20 |
| Bridge Power | 0.00 | 2.79 | 8.74 | 5.43 | 16.96 |
| Import | 1.68 | 2.52 | 1.33 | 3.09 | 8.62 |
| Total | 461.70 | 491.77 | 493.08 | 670.22 | 2,116.77 |

| | | Fuel Consumption (MMBtu) | | | |
|---|---|---|---|---|---|
| | Heat rate (Btu/kWh) | Natural gas | LCO | HFO | DFO |
| TAPCO | 12,054.90 | 1,731,349.43 | - | - | - |
| TICO | 10,922.62 | 891,256.01 | - | - | - |
| SAPP | 8,112.10 | 2,331,515.73 | - | - | - |
| TT2PP | - | - | - | - | - |
| | | | | | |
| TT1PP | 13,178.40 | 974,279.44 | - | - | - |
| CENIT | 12,291.29 | 10,078.86 | - | - | - |
| KARPOWERSHIP | 8,064.67 | 2,648,881.65 | - | - | - |
| AMERI PLANT | - | - | - | - | - |
| KPONE THERMAL | 12,352.36 | 261,642.59 | - | - | 4,548.41 |
| CENPOWER | 9,073.60 | 1,528,163.82 | - | - | 127,042.88 |
| AKSA ENERGY | 7,895.43 | 316,723.58 | - | 158,581.11 | - |
| Twin City | 8,120.68 | 136,234.13 | - | - | - |
| Bridgepower | - | - | - | - | - |


Daily System and Ghana Peak loads
4,000.00
3,500.00
3,000.00
2,500.00
2,000.00
1,500.00
1,000.00
500.00
0.00
1-Mar-24 2-Mar-24 3-Mar-24 4-Mar-24 5-Mar-24 6-Mar-24 7-Mar-24 8-Mar-24 9-Mar-24 10-Mar-24 11-Mar-24 12-Mar-24 13-Mar-24 14-Mar-24 15-Mar-24 16-Mar-24 17-Mar-24 18-Mar-24 19-Mar-24 20-Mar-24 21-Mar-24 22-Mar-24 23-Mar-24 24-Mar-24 25-Mar-24 26-Mar-24 27-Mar-24 28-Mar-24 29-Mar-24 30-Mar-24 Monthly
System Peak Load (MW)
Ghana Peak Load (MW)


Daily electricity supply and load factor
76.00
74.00
72.00
70.00
68.00
66.00
64.00
62.00
60.00
58.00
56.00
90.00
88.00
86.00
84.00
82.00
80.00
78.00
76.00
74.00
72.00
70.00
1-Mar-24 2-Mar-24 3-Mar-24 4-Mar-24 5-Mar-24 6-Mar-24 7-Mar-24 8-Mar-24 9-Mar-24 10-Mar-24 11-Mar-24 12-Mar-24 13-Mar-24 14-Mar-24 15-Mar-24 16-Mar-24 17-Mar-24 18-Mar-24 19-Mar-24 20-Mar-24 21-Mar-24 22-Mar-24 23-Mar-24 24-Mar-24 25-Mar-24 26-Mar-24 27-Mar-24 28-Mar-24 29-Mar-24 30-Mar-24
Supply (GWh)
Load Factor (%)


Summary of Market Prices for March 2024
US$/M
30.00
25.00
20.00
15.00
10.00
5.00
0.00
1-Mar-24
2-Mar-24
3-Mar-24
4-Mar-24
5-Mar-24
6-Mar-24
7-Mar-24
8-Mar-24
9-Mar-24
10-Mar-24
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29-Mar-24
30-Mar-24
31-Mar-24
Monthly
SMC

# 2020-2022 REPORT

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**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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