



# GHANA WHOLESALE ELECTRICITY MARKET BULLETIN

## MARKET WATCH

Monthly Market Data Analysis

ISSUE NO. 79

1<sup>st</sup> July 2022 to 30<sup>th</sup> September 2022

This Bulletin covers major developments in the Wholesale Electricity Market (WEM) of Ghana from 1<sup>st</sup> July 2022 to 30<sup>th</sup> September, 2022. 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) Secretariat would very much appreciate and welcome comments from readers on the Bulletin.

### HIGHLIGHTS OF THE MONTH

The System Peak Load for July, August and September 2022 was 3,117.60 MW, 3,052.20 MW, 3,135.3MW respectively which was lower than 3,218MW, 3,269MW, and 3,267MW projected in the 2022 Electricity Supply Plan (ESP). Apart from August 2022, the export demand at the System Peak Load for July and September was between 6% to 67% higher than the projected export demand in the 2022 ESP.

The Ghana Peak Load, which is Ghana's maximum demand (excluding export), for July, August and September 2022 was 2,830.1MW, 2,781.2MW and 2,817.3MW respectively. This was however lower than 2,918MW, 2,969MW and 2,967 MW projected in the 2022 Electricity Supply Plan.

Electricity supply in June, 2022 was higher than the supply in July, August, and September, 2022. Electricity Supplied decreased by 2.4%, 6.6% and 6.3% in July, August and September 2022 respectively compared to 60.3GWh per day supplied in June, 2022. The actual supply in July, August and September 2022 was 59GWh, 56.4GWh and 56.7GWh was lower than the projected 59.6GWh, 61.6GWh and 61.4GWh respectively in the 2022 ESP.

The Regulated Market accounted for 75.9%, 76.7%, and 76.5% of electricity purchased in the Ghana wholesale electricity market in July, August and September 2022 respectively. The De-regulated Market accounted for 8.1% 7.9% and 8.2% for July, August and September respectively. The export market accounted for the rest.

The Akosombo Dam water level begun to record positive net inflows from July 2022. The water level at the end of the month

increased to 260.84 feet from 260.77 feet at the beginning of the month. The water increased at a rate of 0.03 feet per day in August 2022 and 0.22 per day in September, 2022. The end month water level for September 2022 was 7.68 feet higher than the 260.77 recorded at the beginning of July 2022.

The Bui dam water level continued to increase in July, August and September 2022. The water level increased by 0.08 feet per day in July 2022, 0.25 feet per day in August 2022 and 0.64 feet per day in September 2022. The end month water level for September was 19.19 feet higher than the 560.20 recorded at the beginning of July, 2022.

Natural gas continued to be 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 over 99%. This underscore 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 dropped by 4% in July 2022 from 3,309.3MW in June 2022. In the month of August 2022, the System Peak Load dropped by 3.9% when compared to the System Peak Load for July 2022. In September 2022, the System Peak Load increased by 2.7% from 3,052.2MW recorded in August 2022. The System Peak load in July, August and September, 2022 was 3,177MW, 3,052MW and 3135.3MW respectively.

## HIGHLIGHTS OF THE MONTH

The Ghana Peak Load continued to reduce by an average of 3.9% over the period from June, 2022 to July, 2022 from 3,068MW to 2,830.1MW. In August 2022, Ghana's Peak Load reduced by 1.7% to 2,781MW from 2,830.1MW recorded in July 2022. Contrary to the trend in the reduction in the Ghana's peak load, the Ghana's peak load increased in September 2022 by 1.3% compared to August 2022 peak load of 2,781.2MW.

The average electricity demand increased from 2,512MW in June 2022 to 2,539.7MW in July 2022. On the contrary, the Average demand for August 2022 reduced to 2,430.40MW from 2539.7MW in July 2022. Also, September 2022 recorded 2,363.23MW in average electricity demand, a reduction from 2,430.40 MW recorded in August 2022.

Average electricity demand for the Regulated Market was 1,858.5MW, 1,788.4MW and 1,803.3MW for July, August and September 2022. June 2022 recorded 1,950.3MW which was higher than what was recorded in July, August and September 2022. This could be attributed to the cold weather conditions in these months compared to June. The average demand for the De-regulated Market was 199.5MW, 199.5MW and 193.3MW for July, August and September 2022 respectively. Export Markets also recorded an average demand of 391.8MW, 358.6MW and 359.3MW for the months of July, August and September 2022.

For the regulated markets, ECG accounted for 87.6% of the average demand while NEDCo and EPC accounted for 10.9% and 1.5% respectively. The de-regulated markets; mines and industrial customers accounted for 89.28% and 10.72% respectively. Export to neighboring countries accounted for 75.01% of the average export demand whilst Valco accounted for the rest.

### Electricity supply

In July 2022, electricity supply averaged 59GWh per day, which was lower than the 59.6GWh per day projected in the 2022 ESP. A total of 1,828.52 GWh of electricity was supplied in July 2022, which was also 1.02% lower than the projected 1,847.4GWh in the 2022 ESP. Domestic supply accounted for 99.9% of the total generation while inadvertent imports from CIE accounted for 0.1%. Electricity export in July 2022 totaled 198.82 GWh and this was 39% higher than the 142.9 GWh projected in the 2022 ESP.

In August 2022, electricity supply averaged 56.3 GWh per day, which was lower than the 59.7 GWh per day projected in the 2022 ESP. A total of 1,746.56 GWh of electricity was supplied in August 2022, which was also 5.6% lower than the projected 1,850.8 GWh. Domestic supply accounted for 99.9% of the total generation while inadvertent imports from CIE accounted for 0.23%. Electricity export in August 2022 totaled 182.06 GWh and this was 40.9% higher than the 129.2 GWh projected in the 2022 ESP.

In September 2022, electricity supply averaged 56.5 GWh per day, which was lower than the 61.3GWh per day projected in the 2022 ESP. A total of 1,696.94 GWh of electricity was supplied in September 2022, which was also 7.7% lower than the 1,839.5 GWh projected in the 2022 ESP. Domestic supply accounted for 99.9% of the total generation while inadvertent imports from CIE accounted for 0.33%. Electricity export in

September 2022 totaled 187.62 GWh and this was 48% higher than the 126.7GWh projected in the 2022 ESP.

The electricity supplied by the thermal power plants in July 2022 constituted 65.85% of the total electricity supplied which is lower than the 66.34% recorded in June 2022. In addition, August total electricity supplied by thermal power plant was 67.18%, which was higher than the share of electricity supplied in July 2022. September share of electricity supplied by the thermal power plant was 58.74%, which lower than July and August 2022. This is attributable to increase inflows in Akosombo and Bui hydroelectric dam necessitating the increase in supply from these plants to avoid spilling.

The contribution of the electricity supplied from the solar power plants decreased from 0.33% in June 2022 to 0.30% in July 2022, 0.29% in August and 0.30% in September 2022. Solar power plants in August was 0.29%, which has decreased from what was produced in July. September's solar power generation was the same as July, which was recorded at 0.30%.

Renewable energy therefore accounted for 34.02%, 32.58% and 40.96% of the total electricity supplied in July, August and September 2022 respectively.

Electricity export to our neighboring countries increased by 9% from 164.57GWh in June 2022 to 198.82GWh in July 2022. This decreased by 4.4% from 198.82GWh in July 2022 to 182.05GWh in August. September's export to neighboring countries increased to 187.62GWh with a difference of 5.57 GWh when compared to the supply in August 2022.

Electricity export to CIE and CEB increased from 16.2 GWh and 46.4 GWh in June 2022 to 25.09 GWh and 75.75 GWh in July 2022 respectively. In August 2022, Export to CIE was 14.42 GWh which decreased to 6.77 GWh in September 2022 whilst export to CEB increased from 67.86GWh in August 2022 to 78.44 in September 2022.

SONABEL over the months have had a larger share in the export of electricity as compared to CIE and CEB. In July 2022, SONABEL share in the Export supply was 52.9% whilst in August 2022 and September 2022 SONABEL had 57.6% and 53.6% share in export supply. In July 2022, SONABEL recorded 112.21GWh, In August 2022 and September 2022 the export supply decreased gradually from 110.97GWh to 102.54GWh.

A total of 1,319.05GWh, 1,274.54GWh, and 1,248.82GWh of electricity was supplied to the Regulated Market in July, August and September 2022 respectively with the Electricity Company of Ghana (ECG) accounting for 87.6% of the total electricity supplied. Northern Electricity Company (NEDCo) and Enclave Power Company (EPC) accounted for 12.4%.

The De-regulated Market made up of the Mines and Industrial customers were supplied 131.9 GWh of electricity per month for both July and August 2022. The supply to the de-regulated market increased by 1.4% in September 2022 to 133.8GWh of electricity. The Mines accounted for 91.8% of the total supply to the market whilst industrial customers accounted for the rest.

A total of 213.05GWh, 193.25GWh and 187.75 of electricity was supplied to the export market in July, August and September 2022 respectively.

# HIGHLIGHTS OF THE MONTH

Table 1, 2 and 3 shows a comparison of the Projected and Actual Electricity Demand and Supply for July 2022 and June 2022, August and July 2022 and September and August 2022

**Table 1. Projected and Actual Outturn of Electricity Demand and for Supply in June 2022 and July 2022**

	Jun-22		Jul-22	
	Projected	Actual	Projected	Actual
Total Supply (GWh)	1,853.4	1,808.6	1,847.4	1,828.5
Source by Power Plants (GWh)				
AKOSOMBO	422.9	471.9	437.0	470.3
KPONG	81.1	84.2	83.6	83.7
BUI	51.0	42.3	52.0	62.1
BUI Solar	5.4	5.9	10.4	5.5
Kaleo	1.5	2.2	1.6	1.4
Sunon Asogli	181.4	235.3	118.6	229.7
TAPCO	189.5	208.1	183.7	231.3
TICO	188.9	221.2	195.2	240.2
TT1PP	37.6	74.7	-	15.8
CENIT	61.2	72.0	63.2	76.0
TT2PP	9.2	14.1	9.5	12.5
Twin City	116.3	110.4	120.2	126.5
KARPOWER	275.4	85.1	284.6	100.0
AMERI	-	-	-	-
KTPP	-	50.9	63.2	76.0
CENPOWER	202.8	115.6	209.5	84.7
AKSA	9.2	11.0	9.5	10.5
Bridge Power	-	-	-	-
Total Domestic Supply (GWh)	1,853.4	1,804.9	1,841.8	1,826.1
Imports (GWh)	-	3.7	-	2.4
Total Supply (GWh)	1,853.4	1,808.6	1,841.8	1,828.5
Ghana Coincident Peak Load (MW)	3,059.0	3,062.3	2,918.0	2,830.1
System Coincident Peak Load (MW)	3,389.0	3,309.3	3,218.0	3,177.6

**Table 2. Projected and Actual Outturn of Electricity Demand and for Supply in July 2022 and August 2022.**

	July ,2022		August, 2022	
	Projected	Actual	Projected	Actual
Total Supply (GWh)	1,847.4	1,828.5	1,850.8	1,746.6
Source by Power Plants (GWh)				
AKOSOMBO	437.0	470.3	436.9	408.1
KPONG	83.6	83.7	83.6	77.2
BUI	52.0	62.1	52.0	76.0
BUI Solar	10.4	5.5	10.4	5.1
Kaleo	1.6	1.4	1.7	1.2
Sunon Asogli	118.6	229.7	235.1	135.9
TAPCO	183.7	231.3	74.3	205.7
TICO	195.2	240.2	195.2	218.1
TT1PP	-	15.8	59.5	70.7
CENIT	63.2	76.0	63.2	66.9
TT2PP	9.5	12.5	9.5	4.2
Twin City	120.2	126.5	120.2	146.8
KARPOWER	284.6	100.0	284.6	64.5
AMERI	-	-	-	-
KTPP	63.2	76.0	-	5.0
CENPOWER	209.5	84.7	209.5	246.6
AKSA	9.5	10.5	9.5	10.5
Bridge Power	-	-	-	-
Total Domestic Supply (GWh)	1,778.6	1,826.1	1,845.2	1,742.4
Imports (GWh)	-	2.4	-	4.2
Total Supply (GWh)	1,778.6	1,828.5	1,845.2	1,746.6
Ghana Coincident Peak Load (MW)	3,059.0	2,830.1	2,969.0	2,781.2
System Coincident Peak Load (MW)	3,389.0	3,177.6	3,269.0	3,052.2

**Table 3. Projected and Actual Outturn of Electricity Demand and for Supply in August 2022 and September 2022**

	August, 2022		September , 2022	
	Projected	Actual	Projected	Actual
Total Supply (GWh)	1,850.8	1,746.6	1,839.5	1,696.9
Source by Power Plants (GWh)				
AKOSOMBO	436.9	408.1	452.7	403.9
KPONG	83.6	77.2	81.0	75.9
BUI	52.0	76.0	60.0	210.9
BUI Solar	10.4	5.1	10.4	5.0
Kaleo	1.7	1.2	1.8	1.3
Sunon Asogli	235.1	135.9	81.2	130.0
TAPCO	74.3	205.7	81.9	214.8
TICO	195.2	218.1	188.9	197.1
TT1PP	59.5	70.7	-	3.3
CENIT	63.2	66.9	61.2	16.8
TT2PP	9.5	4.2	9.2	6.5
Twin City	120.2	146.8	116.5	119.5
KARPOWER	284.6	64.5	275.4	35.7
AMERI	-	-	140.8	-
KTPP	-	5.0	61.2	53.1
CENPOWER	209.5	246.6	202.8	206.2
AKSA	9.5	10.5	9.2	11.3
Bridge Power	-	-	-	-
Total Domestic Supply (GWh)	1,845.2	1,742.4	1,834.0	1,691.2
Imports (GWh)	-	4.2	-	5.8
Total Supply (GWh)	1,845.2	1,746.6	1,834.0	1,696.9
Ghana Coincident Peak Load (MW)	3,059.0	2,781.2	2,967.0	2,817.3
System Coincident Peak Load (MW)	3,389.0	3,052.2	3,267.0	3,133.3

# HIGHLIGHTS OF THE MONTH

## HYDRO DAM LEVELS

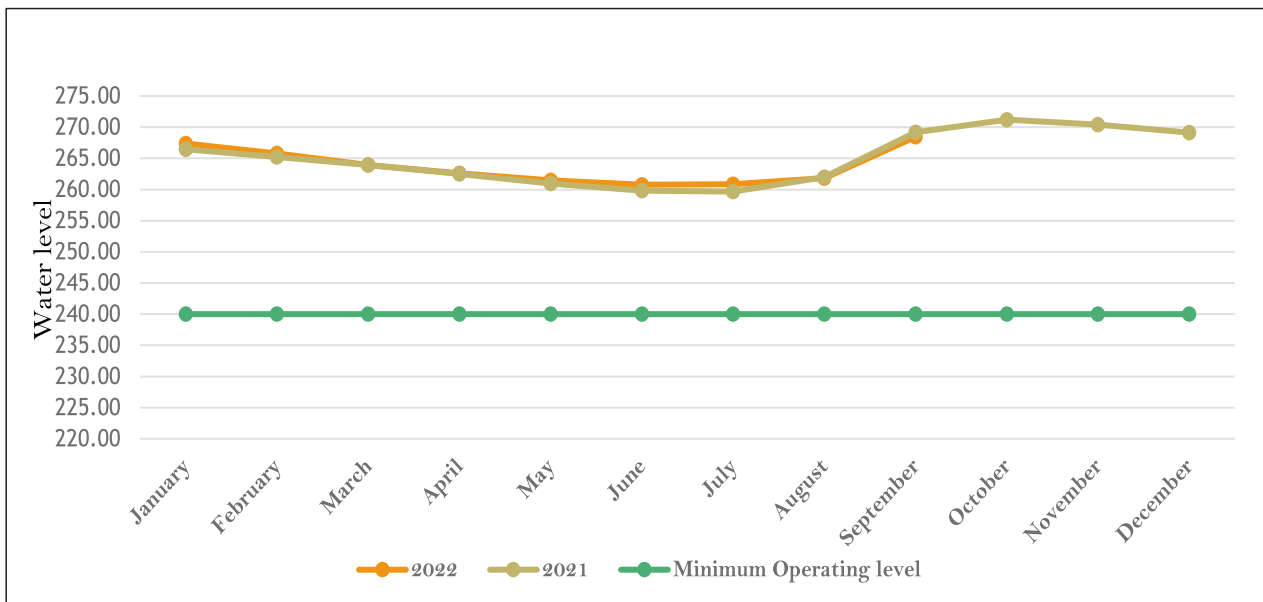
### Akosombo dam water level began to rise in July, 2022

The water level for the Akosombo GS began to increase in July, 2022. The water level increased by 0.07 feet in July 2022, from 260.77 feet at the beginning of the month to 260.84 feet by the end of the month. The month end water level of the Akosombo dam was 1.17 feet above the water level recorded for the same period in 2021 and 20.84 feet above the minimum operating level of the dam.

The Akosombo water level continued to increase in August and September 2022. The water level increased by 7.61 feet from 260.84 feet at the beginning of August 2022 to 268.45 feet at the end of September 2022. Despite the increase in the water level from August to September 2022, the September 2022 end month water level of the Akosombo dam was 0.75 feet lower than the water level in the same period in 2021 and 28.45 feet 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 2021 to September, 2022

Figure 1: Month-End Water Level for Akosombo Dam from January 2021 to September, 2022.



The dam recorded significant increase in its water level

The Bui GS witness an average increase of 0.009 feet per day in June 2022 when the Bui dam water level began to increase. The rate of increase more than doubled in July 2022. At the end of July 2022, the end month water level stood at 562.6 feet higher than the 549.7 feet recorded in 2021 and higher than the minimum operation of 551.2 feet.

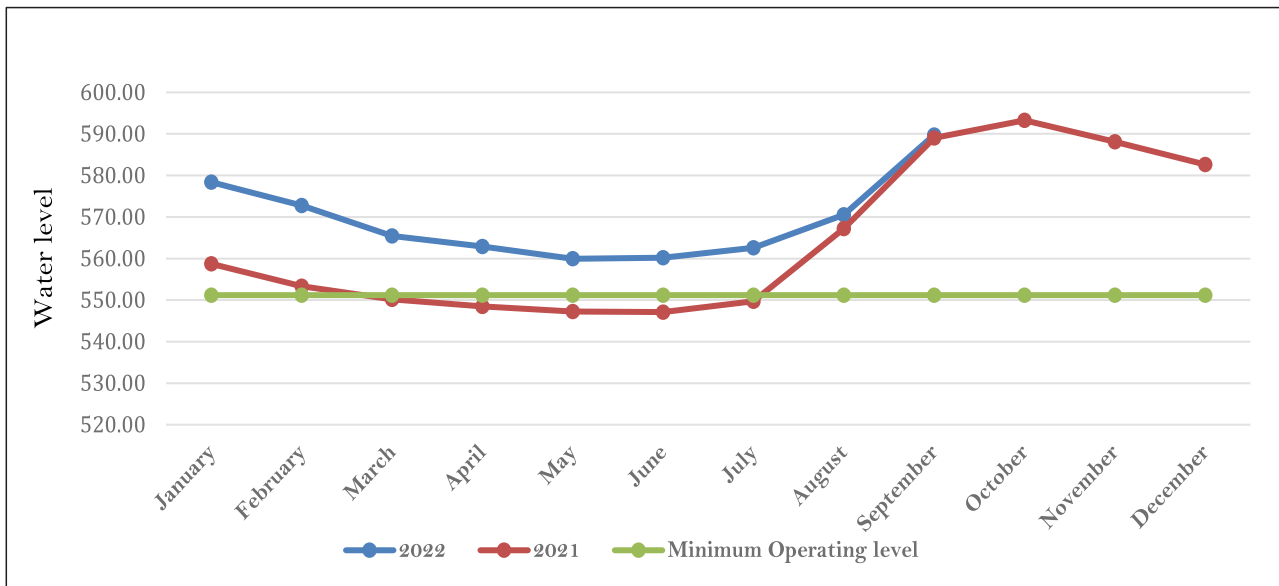
Likewise, the rate of increase in the water level for August 2022 more than doubled compared to July 2022. The rate of increase in water level increased significantly to 0.63 feet per day in September 2022. The water level therefore increased from 562.6 feet at the beginning of August 2022 to 589.73 feet at the end of September 2022. The end month water level for September 2022 was 0.72 feet higher than the water level recorded on the same day for 2021 and was 38.6 feet higher than the minimum operation of 551.2 feet.

Since the Bui GS recorded a significant increase in its water level from June 2022, it has increased its generation. The plant generated 46.6% higher in July 2022 compared to June 2022. Likewise, electricity generation from the power plant increased to 2.45GWh in August and 7.02GWh in September. This significant increase in electricity generation from July to September was to avoid spillage of the dam.

Figure 2 shows the comparative end-of-month trajectory of the level of water in the Bui dam from January 2021 to September 2022.

## HIGHLIGHTS OF THE MONTH

Figure 2: Month-End Water Level for Bui Dam from January 2021 to September, 2022.



### FUEL SUPPLY FOR POWER GENERATION

#### Natural gas imports reduced in the 3rd quarter of 2022.

The supply of natural gas from Nigeria through the West African gas pipeline reduced from 72.2 MMSCFD in June 2022 to an average of 46.5MMSCFD in the 3rd quarter of 2022. This represents a decrease of 35.6%. Consequently, the share of the imported natural gas in the total fuel mix decreased from 23% in June 2022 to 12.8% in September 2022. On the average, natural gas import accounted for an average of 16% in the total fuel mix compared to 23% in June. On the average, natural gas import accounted for an average of 83.8% in the total fuel mix compared to 76.8% in June, 2022.

#### Natural gas supply from domestic sources decreased in the 3rd Quarter of 2022

The average natural gas supply for July, August and September 2022 was 233.7MMSCFD which was lower than the average gas supply recorded in June 2022. The natural gas supply for August and September 2022 was 233.7MMSCFD and 218.5MMSCFD which was lower than the 236.8MMSCFD recorded in June 2022. However, the natural gas supply from domestic sources in July increased from 236.8 MMSCFD in June 2022 to 248.6 MMSCFD in July 2022.

#### The liquid fuel used for power generation increased in the 3rd quarter of 2022

The average liquid fuel supply for July 2022 and August 2022 was 7,084bbbls per month which was higher than the 4,144bbbl supply in June 2022. There was an increase in the use of Liquid fuel by 71% in the 3rd quarter of 2022 compared to June 2022. The total of 3,144 bbbls of liquid fuel made up of 2,684 bbbls of LCO and 431bbbls of DFO was used in July, 2022. Liquid fuel consumption increased to 11,054 bbbls made up 9,531bbbls of LCO and 1,523bbbls of DFO. Liquid fuel accounted for an average 0.4% between July and in August 2022. There was no liquid fuel consumption in September, 2022.

# OPERATIONAL FACT SHEET

## Monthly Market Data Analysis for July 2022

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

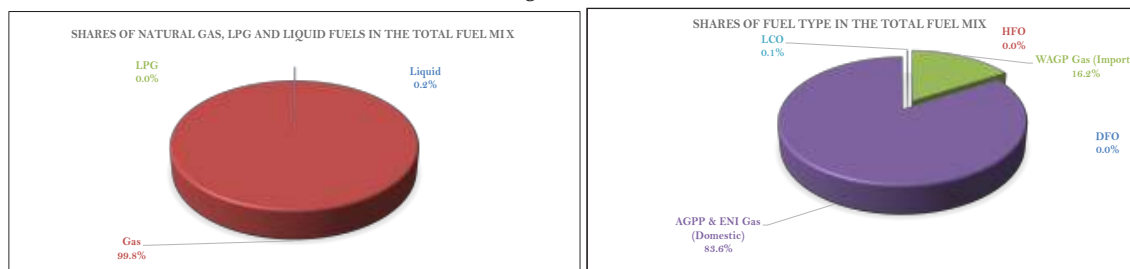


Figure 4a: Contribution of Natural Gas Supply by sources

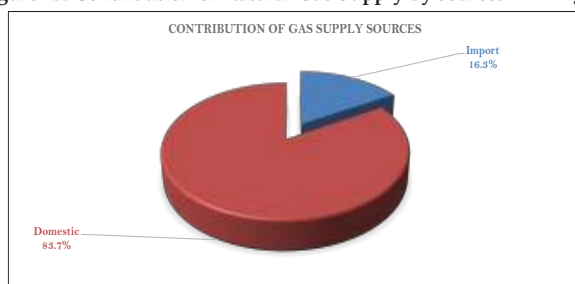


Figure 4b: Contribution of individual fuel in the liquid fuel supply

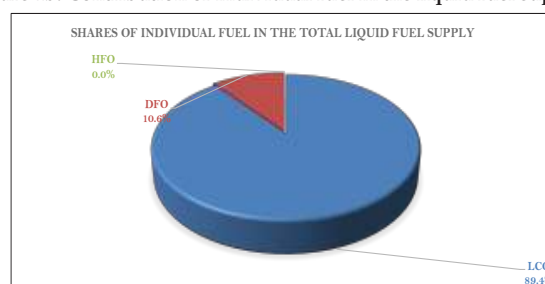


Figure 5a: Electricity Supply by sources

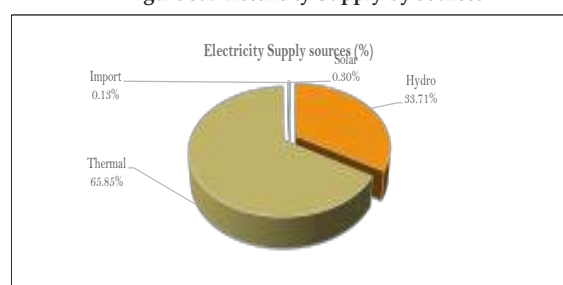
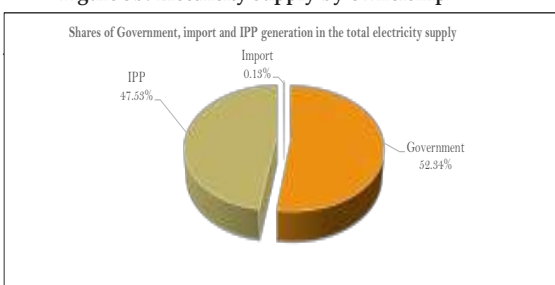


Figure 5b: Electricity supply by ownership



Peak Electricity Supply for July 2022		
Source of Supply	Generation at System Peak Load (MW)	Generation at Ghana Peak Load (MW)
AKOSOMBO	836.80	854.60
KPONG	109.40	113.00
BUI	325.00	326.50
BUI Solar	-	-
SEAP	356.30	352.00
TAPCO	320.70	321.00
TICO	339.10	340.00
TT1PP	-	110.00
CENIT	110.00	108.00
TT2PP	27.80	21.20
TWIN CITY	204.70	203.50
KARPOWER	301.00	266.20
AMERI	-	-
KTPP	106.00	105.00
Trojan Power	-	-
CENPOWER	126.50	-
AKSA	14.30	15.10
Bridge Power	-	-
IMPORT	-	-
Export to CIE at peak	4.00	19.00
Export to CEB at peak	96.00	142.00
Export to Sonabel	147.00	145.00
<b>System Coincident Peak Load</b>	<b>3,177.60</b>	
<b>Ghana Coincedent Peak Load</b>		<b>2,830.10</b>

## OPERATIONAL FACT SHEET

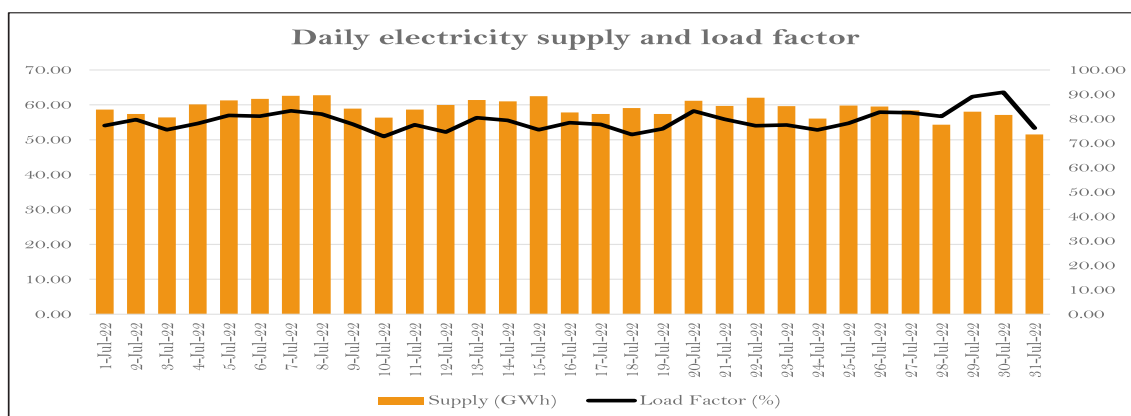
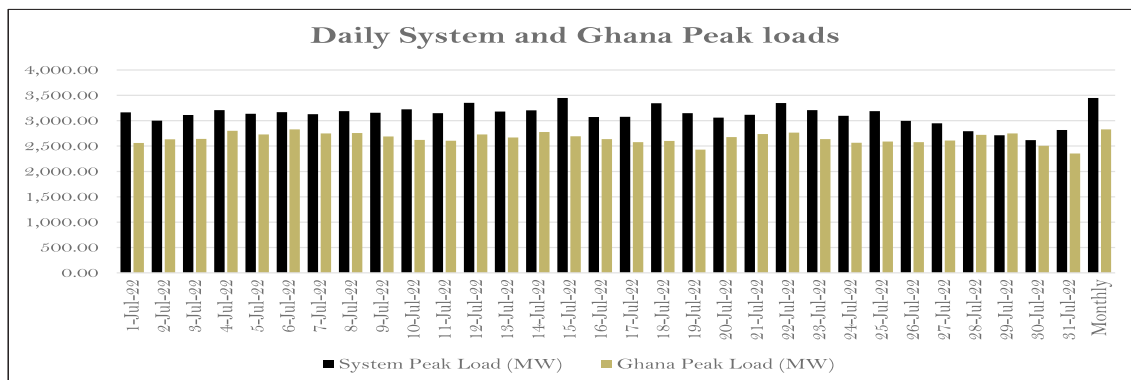
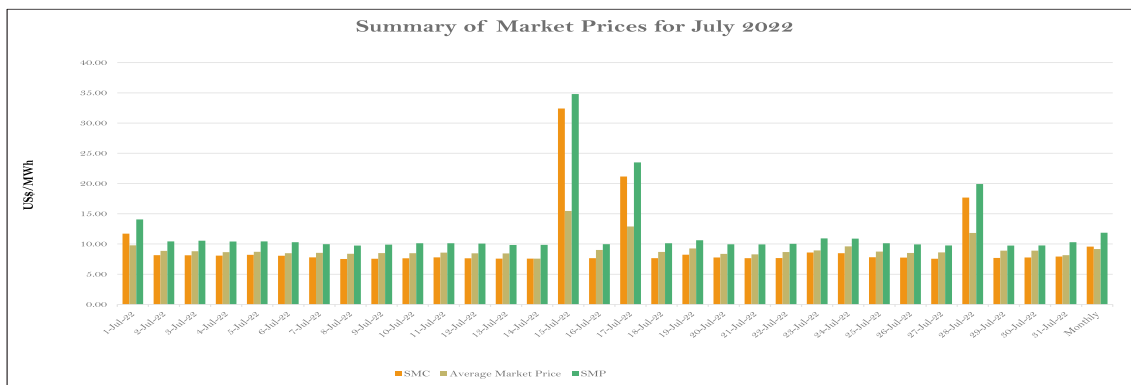
Hydro Dam Water level for July 2022			
	Beginning month (ft)	End month (ft)	Change in water level
Hydro Dam			(feet)
Akosombo	260.77	260.84	0.07
Bui	560.20	562.60	2.40

	Weekly Electricity Supply (GWh)				
	Week 1	Week 2	Week 3	Week 4	Total
AKOSOMBO	107.74	114.31	108.95	139.29	470.29
KPONG	20.08	19.52	18.95	25.13	83.68
BUI Hydro	10.27	17.92	14.62	19.25	62.06
Bui Solar	1.38	1.16	1.24	1.68	5.46
SAPP	58.95	58.42	58.75	53.62	229.74
TAPCO	53.25	51.42	50.12	76.48	231.28
TICO	55.47	53.08	51.48	80.18	240.21
TT1PP	15.84	0.00	0.00	0.00	15.84
CENIT	17.79	18.20	18.21	21.78	75.98
TT2PP	3.44	3.57	3.83	1.65	12.49
Twin City	23.36	32.36	30.74	40.02	126.48
KARPOWER	29.24	26.75	27.77	16.28	100.05
AMERI	0.00	0.00	0.00	0.00	0.00
KTPP	17.78	18.66	17.71	21.85	75.99
Cenpower	0.00	0.00	9.34	75.39	84.73
AKSA	2.58	2.47	2.30	3.12	10.47
Bridge Power	0.00	0.00	0.00	0.00	0.00
Import	0.54	0.85	0.68	0.35	2.42
<b>Total</b>	<b>417.72</b>	<b>418.69</b>	<b>414.70</b>	<b>576.04</b>	<b>1,827.15</b>

	Heat rate (Btu/kWh)	Fuel Consumption (MMBtu)			
		Natural gas	LCO	HFO	DFO
TAPCO	8,514.86	1,969,281.67	-	-	-
TICO	8,100.10	1,945,752.01	-	-	-
SAPP	7,743.62	1,778,979.70	-	-	-
TT2PP	11,981.62	149,621.64	-	-	-
TT1PP	12,700.19	201,171.08	-	-	-
CENIT	11,846.57	900,095.36	-	-	-
KARPOWERSHIP	8,176.66	818,037.38	-	-	-
AMERI PLANT	-	-	-	-	-
KPONE THERMAL	11,494.05	873,486.58	-	-	-
CENPOWER	8,261.53	683,475.16	14,195.74	-	2,318.91
AKSA ENERGY	8,920.82	93,368.01	-	-	-
Twin City	8,201.57	1,037,354.81	-	-	-
Bridgepower	-	-	-	-	-

July 2022 Average Monthly Natural Gas Flowrate (MMSCFD)	
Location	Monthly Average
Etoki	<b>51.36</b>
Tema WAGPCo	<b>135.81</b>
Aboadze WAGPCo	<b>0.00</b>
Aboadze GNGC	<b>105.61</b>
Reverse Flow	<b>85.18</b>

# ECONOMIC FACT SHEET



Monthly Average Electricity Prices in the WEM				
		Jul-22	Jun-22	Change
Average Market Price (AMP)	US\$/MWh	91.58	100.29	-8.71
System Marginal Cost (SMC)	US\$/MWh	95.66	108.16	-12.50
System Marginal Price (SMP)	US\$/MWh	118.58	130.80	-12.22

Month Average fuel prices						
	Gazetted Natural Gas Price	Weighted average natural gas price	LCO	HFO	DFO	LPG
US\$/MMBtu	6.08	6.22	18.22	15.83	42.33	14.35

Power Plants	Average fuel price (US\$/MMBtu)
TAPCO	6.08
TICO	6.08
SAPP	6.08
TT <sub>2</sub> PP	6.08
TT <sub>1</sub> PP	6.08
CENIT	6.08
KARPOWERSHIP	6.08
AMERI PLANT	0.00
KPONE THERMAL	6.08
CENPOWER	6.45
AKSA ENERGY	6.08
Twin City	6.08
Bridgepower	0.00



# OPERATIONAL FACT SHEET

## Monthly Market Data Analysis for August 2022.

Figure 6a: Shares of sources of fuel in the total fuel mix for power generation Figure 6b: Shares of fuel types in the generation fuel mix of power generation

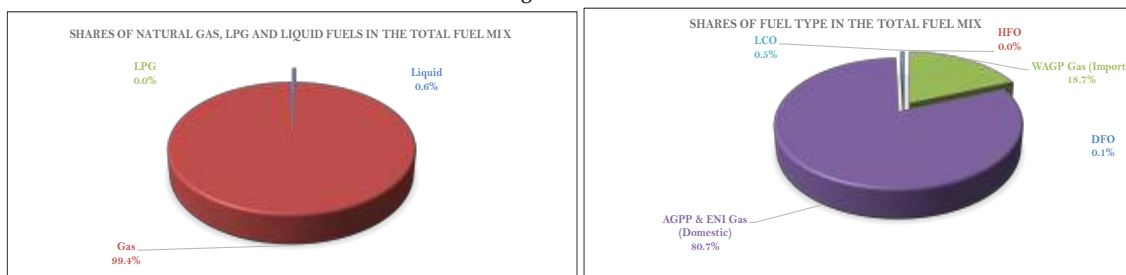


Figure 7a: Contribution of Natural Gas Supply by sources

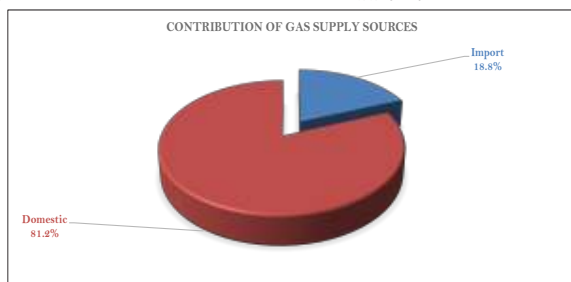


Figure 7b: Contribution of individual fuel in the liquid fuel supply

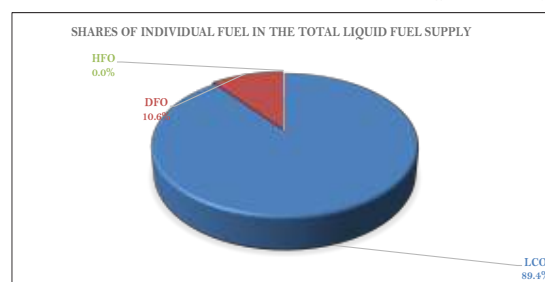


Figure 8a: Electricity Supply by sources

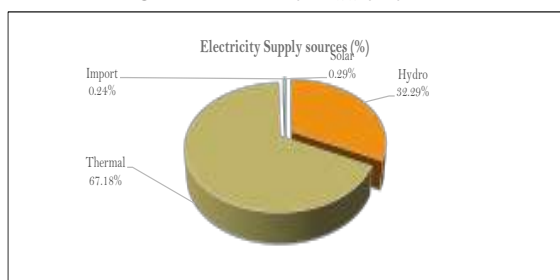
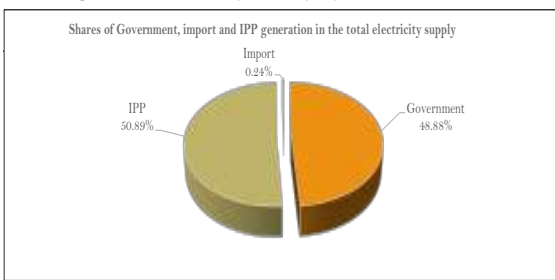


Figure 8b: Electricity supply by ownership



Peak Electricity Supply for August 2022		
Source of Supply	Generation at System Peak Load (MW)	Generation at Ghana Peak Load (MW)
AKOSOMBO	630.90	630.90
KPONG	116.00	116.00
BUI	221.50	221.50
BUI Solar	-	-
SEAP	357.10	357.10
TAPCO	541.00	541.00
TICO	342.00	342.00
TT1PP	111.00	111.00
CENIT	109.00	109.00
TT2PP	-	-
TWIN CITY	208.00	208.00
KARPOWER	18.30	18.30
AMERI	-	-
KTPP	-	-
Trojan Power	-	-
CENPOWER	382.00	382.00
AKSA	15.40	15.40
Bridge Power	-	-
IMPORT	-	-
Export to CIE at peak	13.00	13.00
Export to CEB at peak	80.00	80.00
Export to Sonabel	178.00	178.00
<b>System Coincident Peak Load</b>	<b>3,052.20</b>	
<b>Ghana Coincedent Peak Load</b>		<b>2,781.20</b>

## OPERATIONAL FACT SHEET

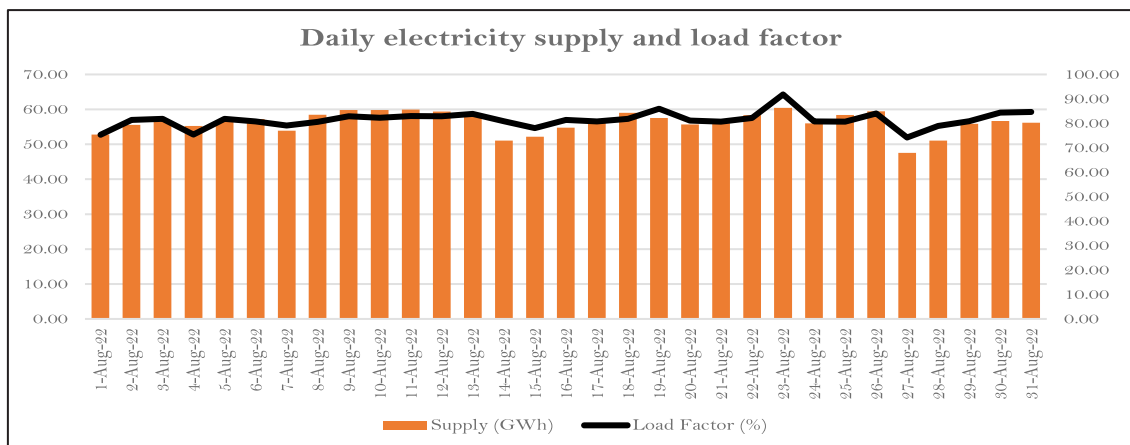
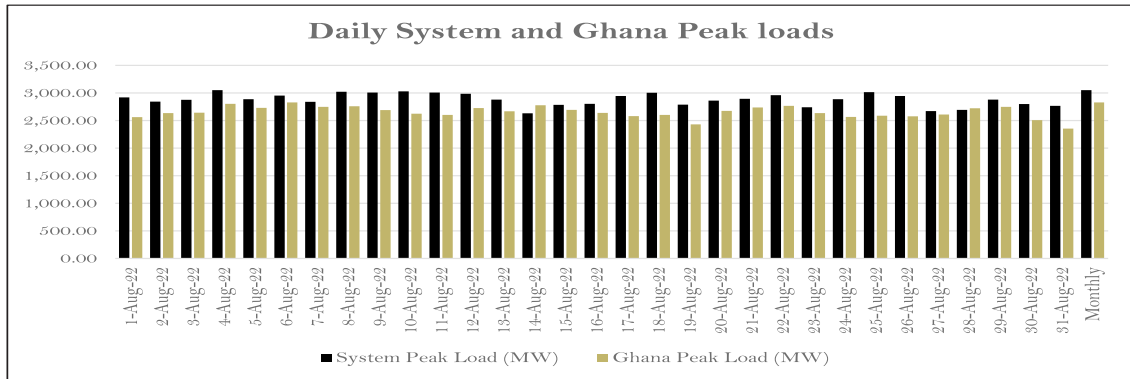
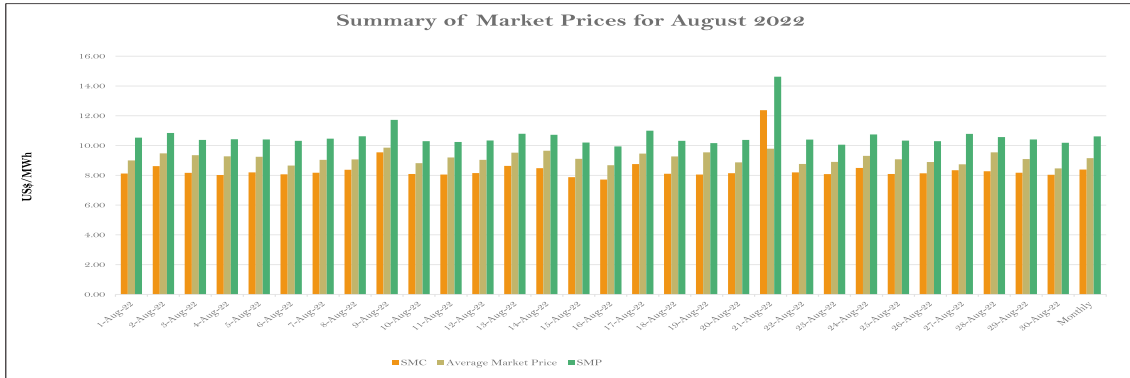
Hydro Dam Water level for August, 2022			
	Beginning month (ft)	End month (ft)	Change in water level
Hydro Dam			(feet)
Akosombo	260.84	261.85	1.01
Bui	562.60	570.54	7.94

	Weekly Electricity Supply (GWh)				
	Week 1	Week 2	Week 3	Week 4	Total
AKOSOMBO	84.92	98.26	91.28	133.64	408.10
KPONG	16.34	18.16	17.44	25.29	77.22
BUI Hydro	9.29	19.70	13.26	37.04	79.29
Bui Solar	1.16	1.17	1.16	1.61	5.09
SAPP	35.52	29.86	29.08	41.48	135.94
TAPCO	53.74	45.25	52.96	53.75	205.70
TICO	56.02	54.82	36.54	70.68	218.06
TT1PP	15.10	16.82	15.04	23.77	70.73
CENIT	14.90	15.78	17.32	18.87	66.88
TT2PP	0.53	1.01	1.36	1.28	4.19
Twin City	31.02	33.25	34.13	48.39	146.79
KARPOWER	3.35	11.90	23.27	25.98	64.50
AMERI	0.00	0.00	0.00	0.00	0.00
KTPP	1.44	0.50	3.03	0.00	4.97
Cenpower	60.31	58.24	54.84	73.18	246.57
AKSA	2.28	2.35	2.47	3.35	10.45
Bridge Power	0.00	0.00	0.00	0.00	0.00
Import	1.65	0.63	0.62	1.26	4.16
<b>Total</b>	<b>387.57</b>	<b>407.70</b>	<b>393.79</b>	<b>559.57</b>	<b>1,748.64</b>

	Heat rate (Btu/kWh)	Fuel Consumption (MMBtu)			
		Natural gas	LCO	HFO	DFO
TAPCO	8,984.47	1,848,095.81	-	-	-
TICO	7,999.00	1,744,272.90	-	-	-
SAPP	7,555.94	1,027,172.28	-	-	-
TT2PP	12,566.41	52,611.77	-	-	-
TT1PP	12,719.87	899,650.97	-	-	-
CENIT	11,851.84	792,688.76	-	-	-
KARPOWERSHIP	8,145.23	525,345.16	-	-	-
AMERI PLANT	-	-	-	-	-
KPONE THERMAL	11,475.53	50,468.37	-	-	6,535.18
CENPOWER	7,824.71	1,877,306.12	50,416.93	-	1,645.72
AKSA ENERGY	9,088.73	94,995.37	-	-	-
Twin City	7,530.66	1,105,433.74	-	-	-
Bridgepower	-	-	-	-	-

August, 2022 Average Monthly Natural Gas Flowrate (MMSCFD)	
Location	Monthly Average
<b>Etoki</b>	<b>53.98</b>
<b>Tema WAGPCo</b>	<b>137.58</b>
<b>Aboadze WAGPCo</b>	<b>0.00</b>
<b>Aboadze GNGC</b>	<b>90.55</b>
<b>Reverse Flow</b>	<b>83.08</b>

# ECONOMIC FACT SHEET



Monthly Average Electricity Prices in the WEM				
		Aug-22	Jul-22	Change
Average Market Price (AMP)	US\$/MWh	91.57	91.58	-0.01
System Marginal Cost (SMC)	US\$/MWh	83.86	95.66	-11.80
System Marginal Price (SMP)	US\$/MWh	106.15	118.58	-12.43

Month Average fuel prices						
	Gazetted Natural Gas Price	Weighted average natural gas price	LCO	HFO	DFO	LPG
US\$/MMBtu	6.08	6.38	19.93	15.88	38.48	14.80

Power Plants	Average fuel price (US\$/MMBtu)
TAPCO	6.08
TICO	6.08
SAPP	6.08
TT2PP	6.08
TT1PP	6.08
CENT	6.08
KARPOWERSHIP	6.08
AMERI PLANT	0.00
KPONE THERMAL	9.79
CENPOWER	6.47
AKSA ENERGY	6.08
Twin City	6.08
Bridgepower	0.00

# OPERATIONAL FACT SHEET

## Monthly Market Data Analysis for September 2022

Figure 9a: Shares of sources of fuel in the total fuel mix for power generation

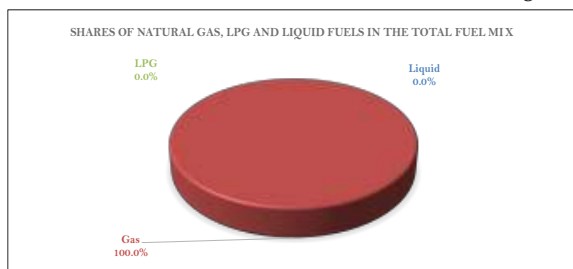


Figure 9b: Shares of fuel types in the generation fuel mix of power generation

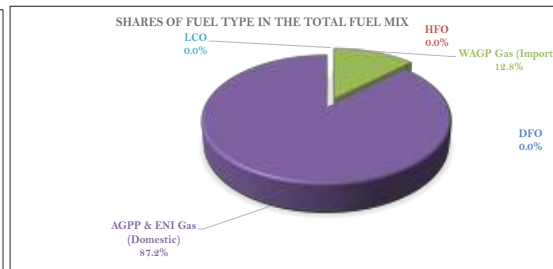


Figure 10a: Contribution of Natural Gas Supply by sources

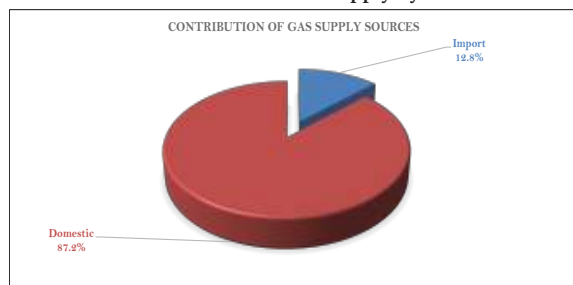


Figure 10b: Contribution of individual fuel in the liquid fuel supply

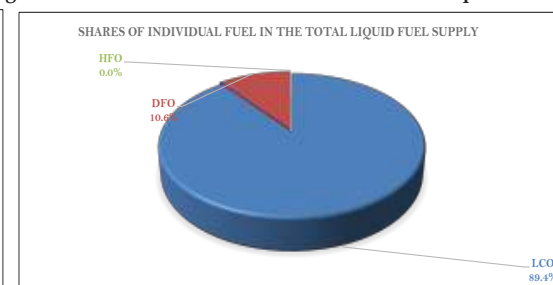


Figure 11a: Electricity Supply by sources

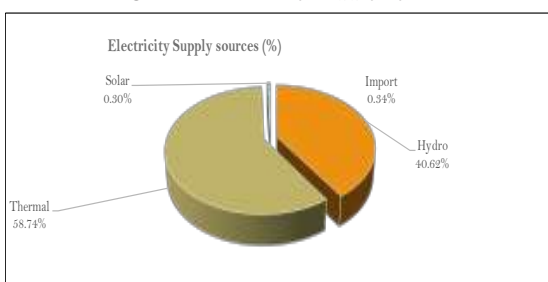
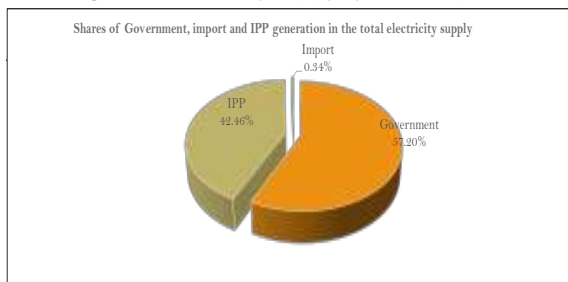


Figure 11b: Electricity supply by ownership



Peak Electricity Supply for September 2022		
Source of Supply	Generation at System Peak Load (MW)	Generation at Ghana Peak Load (MW)
AKOSOMBO	919.90	919.90
KPONG	148.00	148.00
BUI	388.70	388.70
BUI Solar	-	-
SEAP	352.70	352.70
TAPCO	317.00	317.00
TICO	355.00	355.00
TT1PP	-	-
CENIT	-	-
TT2PP	11.10	11.10
TWIN CITY	205.20	205.20
KARPOWER	128.20	128.20
AMERI	-	-
KTPP	105.00	105.00
Trojan Power	-	-
CENPOWER	188.00	188.00
AKSA	16.50	16.50
Bridge Power	-	-
IMPORT	-	-
Export to CIE at peak	12.00	12.00
Export to CEB at peak	168.00	168.00
Export to Sonabel	138.00	138.00
<b>System Coincident Peak Load</b>	<b>3,135.30</b>	
<b>Ghana Coincedent Peak Load</b>		<b>2,817.30</b>

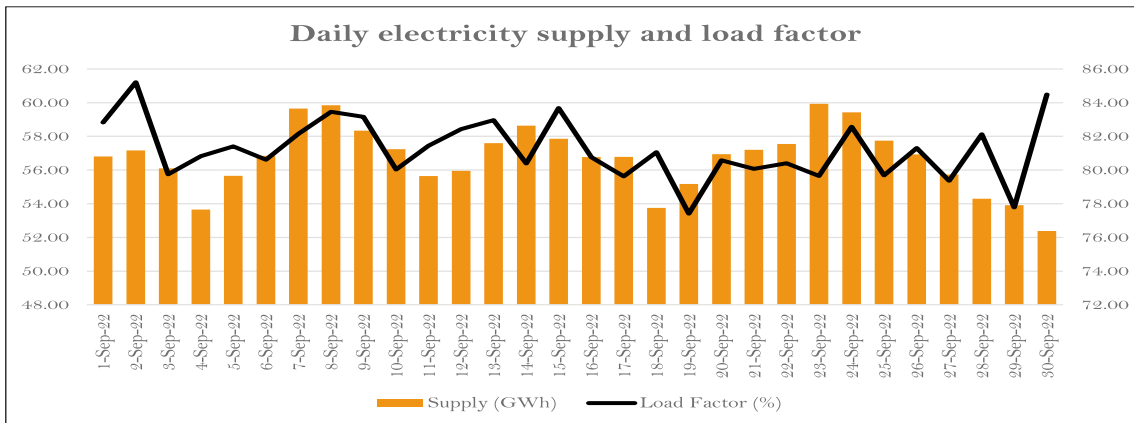
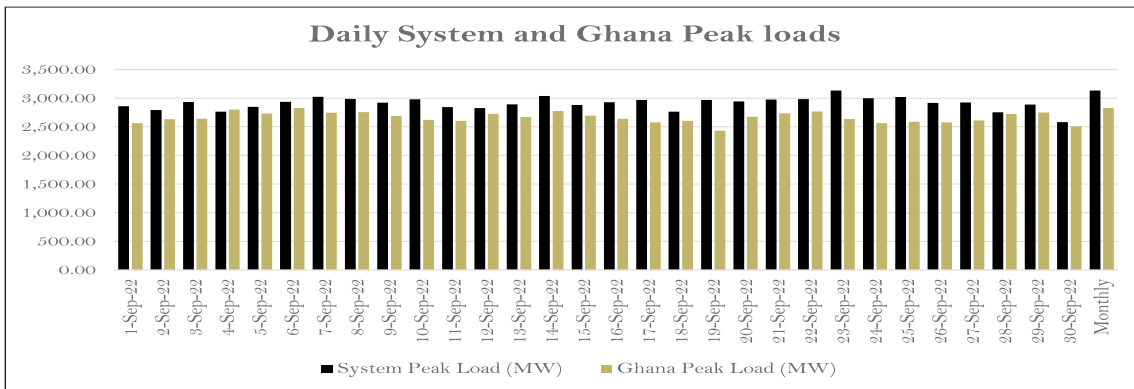
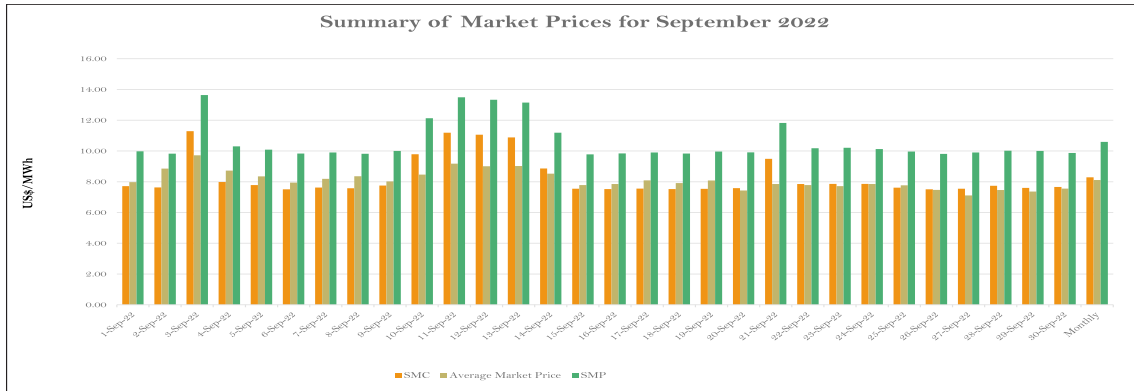
# OPERATIONAL FACT SHEET

Hydro Dam Water level for September, 2022			
	Beginning month (ft)	End month (ft)	Change in water level
Hydro Dam			(feet)
Akosombo	261.85	268.45	6.60
Bui	570.54	589.73	19.19

	Weekly Electricity Supply (GWh)				
	Week 1	Week 2	Week 3	Week 4	Total
AKOSOMBO	95.78	93.81	91.59	122.74	403.92
KPONG	18.01	17.68	16.94	23.28	75.91
BUI Hydro	36.59	46.50	47.67	80.10	210.86
Bui Solar	1.26	1.11	1.13	1.54	5.04
VRA Kaleo	0.35	0.32	0.31	0.36	1.33
SAPP	29.46	29.57	32.33	43.18	134.55
TAPCO	43.66	52.58	52.11	66.42	214.77
TICO	42.05	41.40	47.56	66.09	197.11
TT1PP	0.00	3.25	0.00	0.00	3.25
CENIT	9.10	7.71	0.00	0.00	16.81
TT2PP	0.39	1.87	1.84	2.42	6.51
Twin City	31.12	26.45	22.14	39.77	119.49
KARPOWER	11.96	10.95	5.58	7.22	35.70
AMERI	0.00	0.00	0.00	0.00	0.00
KTPP	13.37	10.55	17.30	11.84	53.05
Cenpower	59.16	55.38	53.89	37.73	206.16
AKSA	2.79	2.72	2.57	3.24	11.32
Bridge Power	0.00	0.00	0.00	0.00	0.00
Import	0.83	1.41	1.54	1.97	5.76
<b>Total</b>	<b>395.88</b>	<b>403.26</b>	<b>394.49</b>	<b>507.90</b>	<b>1,701.53</b>

	Heat rate (Btu/kWh)	Fuel Consumption (MMBtu)			
		Natural gas	LCO	HFO	DFO
TAPCO	8,638.77	1,855,313.88	-	-	-
TICO	8,232.68	1,622,741.63	-	-	-
SAPP	7,882.48	1,060,585.54	-	-	-
TT2PP	11,773.64	76,695.87	-	-	-
TT1PP	12,493.05	40,602.40	-	-	-
CENIT	13,437.53	225,844.65	-	-	-
KARPOWERSHIP	8,210.73	293,110.66	-	-	-
AMERI PLANT	-	-	-	-	-
KPONE THERMAL	11,690.01	620,170.20	-	-	-
CENPOWER	7,869.50	1,622,391.00	-	-	-
AKSA ENERGY	8,846.21	100,103.68	-	-	-
Twin City	7,927.35	947,244.68	-	-	-
Bridgepower	-	-	-	-	-

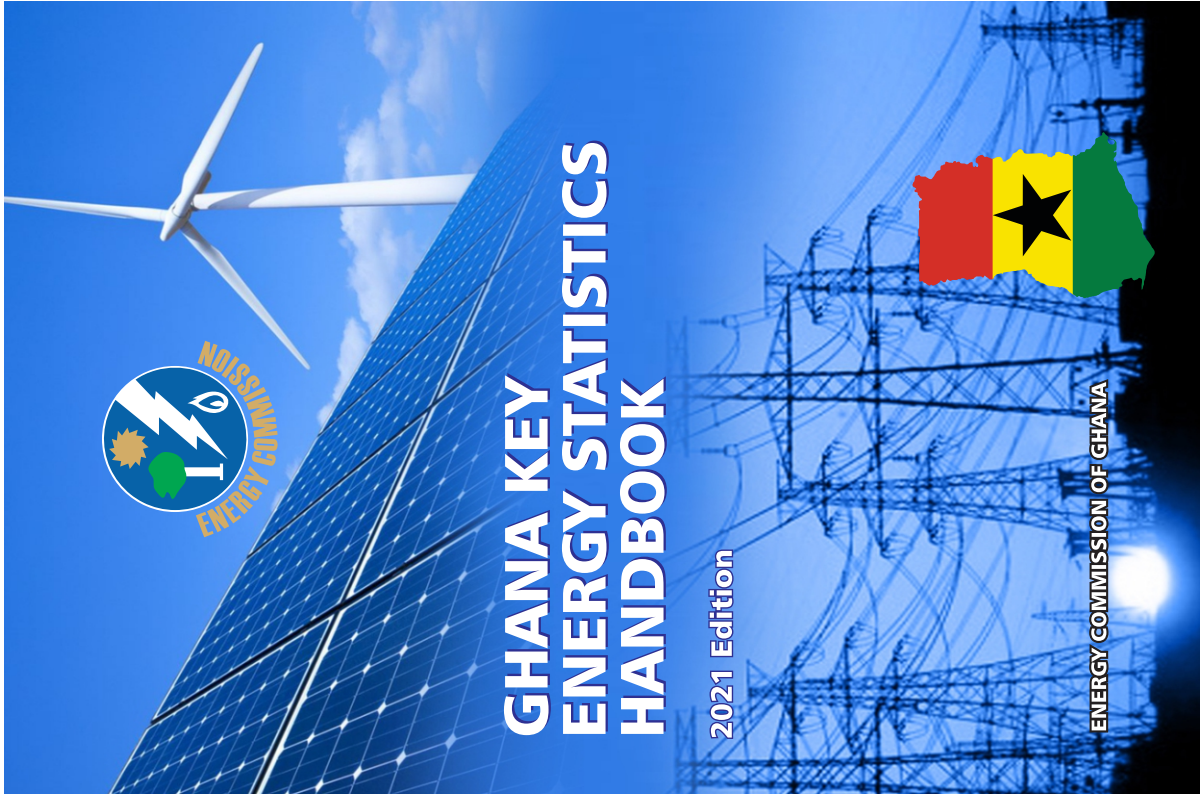
# ECONOMIC FACT SHEET



Month Average fuel prices						
US\$/MMBtu	Gazetted Natural Gas Price	Weighted average natural gas price	LCO	HFO	DFO	LPG
	6.08	6.24	17.92	14.80	38.48	14.08

Monthly Average Electricity Prices in the WEM				
		Sep-22	Aug-22	Change
Average Market Price (AMP)	US\$/MWh	81.15	91.57	-10.42
System Marginal Cost (SMC)	US\$/MWh	82.88	83.86	-0.98
System Marginal Price (SMP)	US\$/MWh	105.95	106.15	-0.20

Power Plants	Average fuel price (US\$/MMBtu)
TAPCO	6.08
TICO	6.08
SAPP	6.08
TT2PP	6.08
TT1PP	6.08
CENIT	6.08
KARPOWERSHIP	6.08
AMERI PLANT	0.00
KPONE THERMAL	6.08
CENPOWER	6.08
AKSA ENERGY	6.08
Twin City	6.08
Bridgepower	0.00



Energy Commission, Ghana  
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ELECTRICITY MARKET OVERSIGHT PANEL (EMOP)

**2019**  
ANNUAL REPORT

REVIEW OF THE GHANA WHOLESALE  
ELECTRICITY MARKET



EMOP SECRETARIAT

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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  
Gh¢ = Ghana Pesewa  
GWh = Giga-watt Hours  
KTPP = Kpone Thermal Power Plant  
MRP = Mine Reserve Plant  
LCO = Light Crude Oil  
LTA = Long Term Average  
MMscf = Million Standard Cubic Feet  
NITS = National Interconnected Transmission System  
SAPP = Sunon Asogli Power Plant  
SNEP = Strategic National Energy Plan  
TT1PP = Tema Thermal 1 Power Plant  
VRA = Volta River Authority  
WAGP = West African Gas Pipeline

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  
LI = Legislative Instrument  
MW = Megawatt  
MWh = Mega-watt hours  
PV = Photovoltaic  
SMP = System Marginal Price  
TEN = Tweneboa, Enyena, Ntomme  
TT2PP = Tema Thermal 2 Power Plant  
WAGPCo = West African Gas Pipeline Company  
WEM = Wholesale Electricity Market

*Compiled by Electricity Market Oversight Panel Secretariat*

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