GHANA WHOLESALE ELECTRICITY MARKET BULLETIN

MARKET WATCH

Monthly Market Data Analysis

ISSUE NO. 80 **1st October 2022 to 31st December 2022**

This Bulletin covers major developments in the Wholesale Electricity Market (WEM) of Ghana from 1st October 2022 to 31st December 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 October, November and December, 2022 was 3,203.40MW, 3,256.10MW, 3,370.80MW respectively which was lower than 3,387MW, 3,494MWand 3,545.27MW projected in the 2022 Electricity Supply Plan (ESP) for October, November and December, 2022 respectively. The export demand at the System Peak Load for October, November and December, 2022 was on the average, 2.1% higher than the projected export demand.

The Ghana Peak Load, which is Ghana's maximum demand (excluding export) for October, November and December 2022 was 2,910.10MW,2928.40MW and 3,049.80MW respectively was lower than 3,087MW, 3194MW and 3,245.27MW projected in the 2022 Electricity Supply plan.

Electricity supply in September, 2022 was lower than October, November and December 2022. Electricity supplied increased by an average of 4.8% in October, November and December, 2022 respectively compared to 56.7GWh per day supplied in September, 2022

In October, 2022 the actual supply was 59.4GWh compared to the projected which was 64.2GWh in the 2022 ESP. In November and December 2022, the actual supply was 61.6GWh and 62.3GWh which was lower than the 67GWh and 67.7GWh respectively in the 2022 ESP.

The Regulated market accounted for 77.6% to 81.8% of electricity purchased in the Ghana wholesale electricity market from October to December, 2022. The De-regulated market accounted for 7.4% and 7.6% from October to December 2022. The export market accounted for a maximum of 14.8%.

The Akosombo Dam water level at the end of the month in October 2022 had increased to 274.20 feet from 268.45feet at the beginning of the month. The Akosombo dam water level began to drop in November, 2022. The water decreased at a rate of 0.014feet per day in November 2022 and 0.052 feet per day in December, 2022. The end year water level for 2022 which was 271.92 feet was 3.47 feet higher than the 268.45 feet recorded at the beginning of the year.

The Bui dam water level continued to increase in October 2022 by 0.29 feet per day. The water level however began to drop in November, 2022. In November 2022, the water level reduced by a rate of 0.16 feet per day. It continued to decrease by 0.33 feet per day in December, 2022. The end year water level for the year 2022 was 5.97 feet higher than the 582.61 feet recorded at the beginning of the year

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%. The unavailability of natural gas can be a very serious point of failure for Ghana's power system.

ELECTRICITY TRADING

Electricity Demand

Having an overview of the 3rd quarter, there was a general increase in the System Peak Load of the 4th quarter compared to the 3rd quarter by 0.8%. Comparing month by month System Peak load of the 4th quarter, the month of November

2022 System Peak Load increased by 1.6% when compared to October, 2022. In December 2022 the system peak load increased by 3.5% from the 3,370.80MW System Peak Load recorded in November 2022. The System Peak Load in October, November and December was 3203.40MW, 3,256.10MW and 3,370.80MW respectively.

The System Peak Load for 2022 was 3,469.4MW which occurred in March, 2022 contrary to historic trend of its occurrence in December.

The Ghana Peak Load continued to increase gradually in October, November and December, 2022 from 2,910.10MW to 2,928.40MW and 3,049.80MW respectively. Ghana's peak load increased by 4.1% in the 4th quarter compared to the 3rd quarter.

Average demand picked up in the 4th quarter of 2022 compared to 3rd quarter of 2022. Average electricity demand decreased to 2,363.23MW in September, 2022 from 2,457.75MW in July 2022. The average electricity demand in the 4th quarter began to pick up in October 2022 by 8.1% from 2,363.23MW in September, 2022 to 2,555.83MW in October, 2022. The average electricity demand increased to 2,567.82MW in November and 2,680.47MW in December, 2022.

Average electricity demand for the Regulated Market was 1,918.34MW, 2,100.32MW and 2,064.86MW for October, November and December, 2022. Comparatively, the 3rd quarter average electricity demand for regulated market was lower than what was recorded in the 4th quarter. This could be due to the hot weather condition that necessitated the need for cooling in the 4th quarter. For the regulated markets, ECG accounted for 88.1% of the average demand while NEDCo accounted for an average of 10.6% and 1.3% respectively for October, November and December respectively.

The average demand for the De-regulated market was 186.15MW, 195.10MW and 192.42MW for October, November and December, 2022. The de-regulated markets in October, November and December 2022 average demand for mines was 91.7% whiles bulk customers accounted for 8.3%

Export markets recorded an average demand of 366.28MW, 272.44MW and 330.50MW for October, November, and December 2022. Export to neighboring countries accounted for 73.1%,94.5% and 80.1% for October, November and December, 2022 respectively while VALCO accounted for 26.9%, 5.45% and 19.9% respectively.

Electricity supply

In October 2022, electricity supply averaged 59.4GWh per day, which was lower than 64.2GWh per day projected in the 2022 ESP. A total of 1,840.20GWh of electricity was supplied in October 2022 which was lower than the 1,990.3GWh projected in the 2022 ESP. domestic supply accounted for 99.75% of the total generation while inadvertent imports from CIE accounted for 0.25%. Electricity export in October, 2022 totaled 187.10GWh and this was higher than the 146.0GWh projected in the 2022 ESP.

A total of 1,848.43GWh of electricity was supplied in November, 2022 which was lower than the 2,010.6GWh projected in the 2022 ESP. Electricity supply averaged to 61.6GWh per day, which was 11.9% lower than the 69.9GWh per day projected in the 2022 supply plan. In addition, domestic Supply accounted for 99.93% of the total generation while inadvertent imports from CIE accounted for 0.07%. Electricity export for the month totaled 171.14GWh and this was 17.6% higher than the 145.5GWh projected in the 2022 ESP.

The domestic supply for December 2022 accounted for 99.89% of the total generation while inadvertent imports from CIE accounted for 0.11%. Furthermore, electricity export totaled 181.59GWh which was higher than the 168.2GWh projected in the 2022 ESP. A total of 1,929.94GWh of electricity was supplied in December, 2022 at an average of 62.3GWh per day which was lower than the 2,098GWh at an average of 67.7GWh per day projected in the 2022 ESP.

The electricity supplied by thermal power plant in October 2022 constituted 55.4% of the total electricity supplied. In addition, November, 2022 electricity supplied by thermal power plant was 59.54% which was higher than the share of electricity supplied in October, 2022. December's share of electricity supplied by thermal power plant was 62.30% which was higher than October and November 2022.

The contribution of electricity supplied from the solar power plant was 0.38% in October, 2022, 0.39% in November 2022 and 0.36% in December 2022. Solar power plants in October was 0.38% which increased to 0.39% in November and decreased to 0.36% in December 2022.

Renewable energy therefore accounted for 44.35%, 40.39% and 37.59% of the total electricity supplied in October, November and December 2022 respectively.

Electricity export to our neighboring countries in October, 2022 was 187.1GWh. In November 2022, there was a reduction in export from 187.1GWh to 171.14GWh. On the contrary, electricity export increased to181.59GWh in December 2022 by 6.1%.

A total of 1,427.24GWh, 1,512.23GWh and 1,536.26GWh of electricity was supplied to the Regulated Market in October, November and December, 2022 respectively with the Electricity company of Ghana (ECG) accounted an average of 88.1% of the total electricity supplied. Northern Electricity company (NEDCO) and Enclave power company (EPC) accounted an average of 11.9%.

The De-regulated market made up of the mines and industrial customers were supplied 138.49GWh,140.47GWh and 143.16GWh of electricity for October, November and December, 2022. The mines accounted for an average of 91.7% of the total supply to the market whilst industrial customers accounted for the rest.

A total of 198.4GWh,184.1GWh and 196.4GWh of electricity was supplied to the export market in October, November and December, 2022. Electricity export to CIE for October, November and December, 2022 was 14.29GWh, 37.21GWh and 36.77GWh respectively. In October, export to CEB was 74.39GWh, this reduced to 43.54GWh in November and increased to 55.85GWh in December, 2022. In October 2022, SONABEL's share in the export of electricity was 109.96GWh. The export of electricity reduced from 109.96GWh in October, 2022 to 103.39GWh in November, 2022 and increased to 103.73GWh in December, 2022. Despite the decline in supply of electricity to SONABEL, the share of electricity supplied to SONABEL was larger than the total electricity supplied to CIE and CEB.

HIGHLIGHTS OF THE MONTH

Table 1, 2 and 3 shows a comparison of the Projected and Actual Electricity Demand and Supply for September and October 2022, October and November 2022 and November and December 2022

Table 1. Projected and Actual Outturn of Electricity Demand and for Supply in September 2022 and October 2022.

	September ,2022		October, 2022	
	Projected	Actual	Projected	Actual
Total Supply (GWh)	1,839.5	1,701.5	1,990.3	1,840.2
Source by Power Plants (GWh)				
AKOSOMBO	452.7	403.9	470.7	438.0
KPONG	81.0	75.9	84.3	75.3
BUI	60.0	210.9	81.0	295.1
BUI Solar	10.4	5.0	10.4	7.0
Kaleo	1.8	1.3	1.8	1.9
Sunon Asogli	81.2	134.5	44.3	346.9
TAPCO	81.9	214.8	195.2	165.1
TICO	188.9	197.1	195.2	219.2
TT1PP	-	3.3	59.5	25.9
CENIT	61.2	16.8	63.2	-
TT2PP	9.2	6.5	9.5	6.5
Twin City	116.3	119.5	120.2	140.7
KARPOWER	275.4	35.7	284.6	64.8
AMERI	140.8	-	145.5	-
KTPP	61.2	53.1	-	1.0
CENPOWER	202.8	206.2	209.5	27.2
AKSA	9.2	11.3	9.5	21.1
Bridge Power	-	-	-	-
Total Domestic Supply (GWh)	1,834.0	1,695.8	1,984.4	1,835.7
Imports (GWh)	-	5.8		4.5
Total Supply (GWh)	1,834.0	1,701.5	1,984.4	1,840.2
Ghana Coincedent Peak Load (MW)	2,967.0	2,817.3	3,087.0	2,910.1
System Coincident Peak Load (MW)	3,267.0	3,135.3	3,387.0	3,203.4

Table 2. Projected and Actual Outturn of Electricity Demand and for Supply in October 2022 and November 2022.

	October, 2022		November, 2022	
	Projected	Actual	Projected	Actual
Total Supply (GWh)	1,990.3	1,840.2	2,010.6	1,848.8
Source by Power Plants (GWh)				
AKOSOMBO	470.7	438.0	455.5	467.9
KPONG	84.3	75.3	81.5	78.7
BUI	81.0	295.1	107.0	192.3
BUI Solar	10.4	7.0	10.4	7.2
Kaleo	1.8	1.9	2.0	1.6
Sunon Asogli	44.3	346.9	94.2	366.5
TAPCO	195.2	165.1	189.5	194.6
TICO	195.2	219.2	188.9	222.4
TT1PP	59.5	25.9	-	1.6
CENIT	63.2	-	61.2	4.7
TT2PP	9.5	6.5	9.2	2.1
Twin City	120.2	140.7	116.3	127.2
KARPOWER	284.6	64.8	275.4	47.7
AMERI	145.5	-	140.8	-
KTPP	-	1.0	61.2	61.4
CENPOWER	209.5	27.2	202.8	47.9
AKSA	9.5	21.1	9.2	23.8
Bridge Power	-	-	-	-
Total Domestic Supply (GWh)	1,984.4	1,835.7	2,005.1	1,847.5
Imports (GWh)		4.5		1.3
Total Supply (GWh)	1,984.4	1,840.2	2,005.1	1,848.8
Ghana Coincedent Peak Load (MW)	3,087.0	2,910.1	3,194.0	2,928.4
System Coincident Peak Load (MW)	3,387.0	3,203.4	3,494.0	3,256.1

Table 3. Projected and Actual Outturn of Electricity Demand and for Supply in November 2022 and December 2022

	November ,2022		December, 2022	
	Projected	Actual	Projected	Actual
Total Supply (GWh)	2,010.6	1,848.8	2,098.2	1,929.9
Source by Power Plants (GWh)				
AKOSOMBO	455.5	467.9	470.7	489.0
KPONG	81.5	78.7	84.3	79.0
BUI	107.0	192.3	111.0	149.9
BUI Solar	10.4	7.2	10.4	6.9
Kaleo	2.0	1.6	1.9	1.5
Sunon Asogli	94.2	366.5	181.8	380.5
TAPCO	189.5	194.6	135.7	218.3
TICO	188.9	222.4	195.2	217.4
TT1PP	-	1.6	59.5	67.0
CENIT	61.2	4.7	63.2	4.9
TT2PP	9.2	2.1	9.5	7.6
Twin City	116.3	127.2	120.2	131.5
KARPOWER	275.4	47.7	284.6	53.6
AMERI	140.8	-	145.5	-
KTPP	61.2	61.4	-	5.7
CENPOWER	202.8	47.9	209.5	93.4
AKSA	9.2	23.8	9.5	21.6
Bridge Power	-	-	-	-
Total Domestic Supply (GWh)	2,005.1	1,847.5	2,092.5	1,927.8
Imports (GWh)		1.3		2.2
Total Supply (GWh)	2,005.1	1,848.8	2,092.5	1,929.9
Ghana Coincedent Peak Load (MW)	3,194.0	2,928.4	3,245.3	3,049.8
System Coincident Peak Load (MW)	3,494.0	3,256.1	3,545.3	3,370.8

HYDRO DAM LEVELS

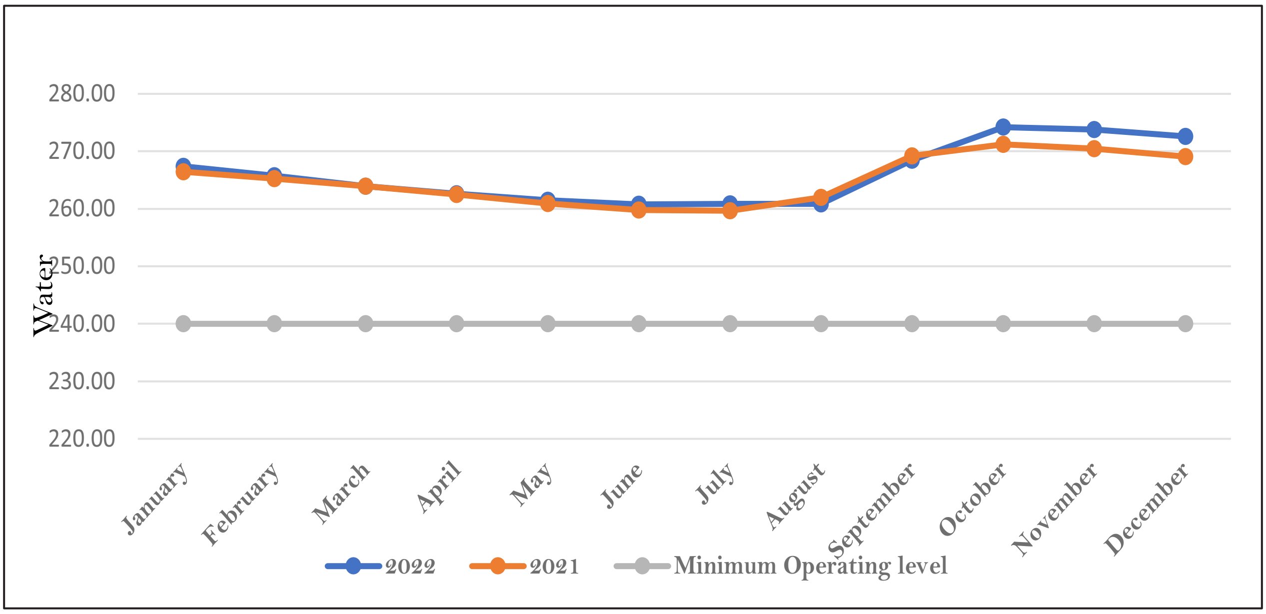
Akosombo dam water level began to decline in November, 2022

The Akosombo water dam level began to decline on the 9th November, 2022 at a rate of 0.01 feet per day. The water level decreased by 0.42 feet in November, 2022 feet from 274.20 feet at the beginning of the month 2022 to 273.78 feet at the end of the Month 2022. The dam water level decline in November, 2022 was a contrast from October, 2022 where the water level increased by 5.75 feet

The water level continued to decline in December, 2022 at an average of 0.04 feet per day. Comparatively, the end months water level for November and December 2022 was 3.34 feet and 3.47 feet above the water level in the same periods in 2021. The end year water level for 2022 was 271.92 feet which was 3.47 feet higher than the 268.45 feet recorded at the beginning of the year

Figure 1 shows the comparative end-of-month trajectory of the level of water in the Akosombo Dam from January 2021 to December, 2022

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



The Bui dam water level began to drop in October, 2022

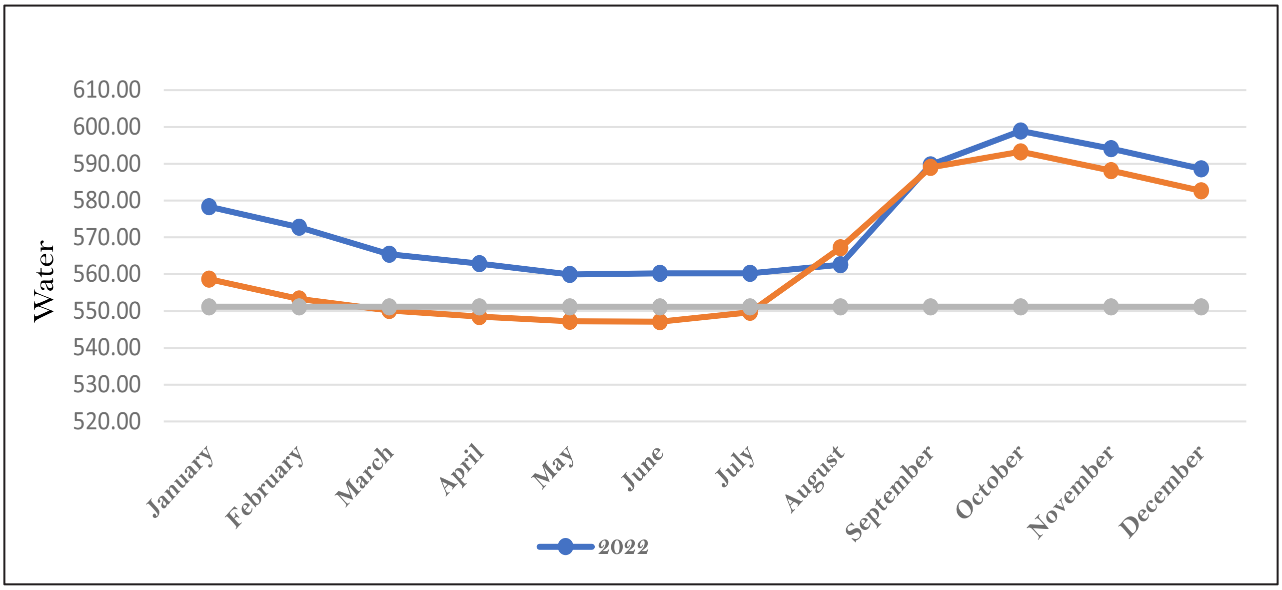
Despite the net inflow into the Bui dam in October 2022, the dam's water level began to drop from the 27th October, 2022 at an average of 0.10 feet per day. The end month water level for October, 2022 which was 598.92 feet was 5.65 feet higher than the water level recorded for the same month for 2021 and was 47.74 higher than the minimum operation of 551.2 feet.

The rate of drop was continuous in the months of November and December, 2022. The Bui GS witness an average decrease of 0.16 feet per day in November, 2022. At the end of November, 2022, the end month water level stood at 594.09 feet higher than the 588.12 feet recorded in 2021 and higher than the minimum operation of 551.18 feet.

There was an increase in the rate of drop from the Bui Dam from 0.16 feet per day in November, 2022 to 0.18 feet per day in December, 2022. The water level reduced from 594.09 feet to 588.58 feet at the end of month of December, 2022. This meant that, the water level at the end of the month was 37.4 feet higher than the minimum operating level of 551.18 feet. The end year water level for the year 2022 was 5.97 feet higher than the 582.61 feet recorded at the beginning of the year

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

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



FUEL SUPPLY FOR POWER GENERATION

Natural gas imports reduced in the 4th Quarter of 2022

The Supply of natural gas from Nigeria through the West African gas pipeline reduced from 46.5MMSCFD in the 3rd quarter of 2022 to 44.4 MMSCFD in the 4th quarter of 2022. This represents a decrease of 4.5%. On the average, natural gas import accounted for an average of 16% in the 3rd quarter and decreased to 15.8% in the 4th quarter in the total fuel mix.

Natural gas supply from domestic sources decreased in the 4th Quarter

The average natural gas supply for October, November and December, 2022 was 231.5MMSCFD which was lower than the average gas supply of 233.7MMSCFD in the 3rd quarter 2022. On the average, natural gas import accounted for an average of 84.2% in the total fuel mix.

Consumption of liquid fuel continued to dwindle

There was no liquid fuel consumption in November and December, 2022 nevertheless, in October, 2022 there was a record of liquid fuel consumption of 2,658.95bbls made up 296.35bbls of LCO and 2,362.61 bbls DFO. On the average, liquid fuel accounted for an average of 0.05% in the total fuel mix.

Monthly Market Data Analysis for October, 2022

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

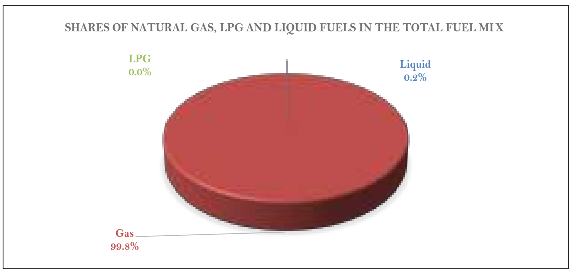


Figure 3b: Shares of fuel types in the generation fuel mix of power generation

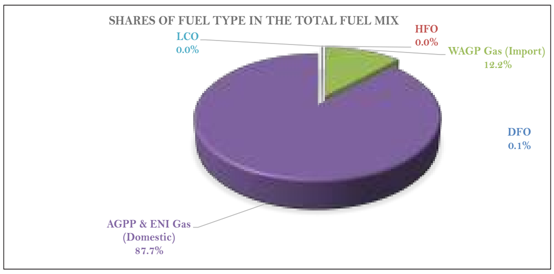


Figure 4a: Contribution of Natural Gas Supply by sources

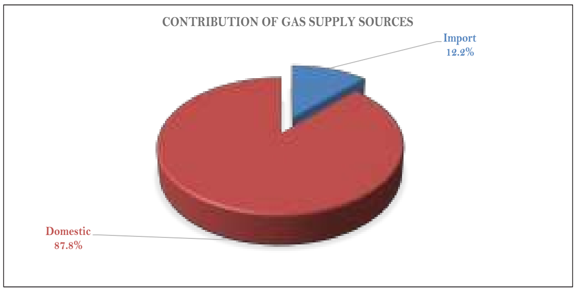


Figure 4b: Contribution of individual fuel in the liquid fuel supply

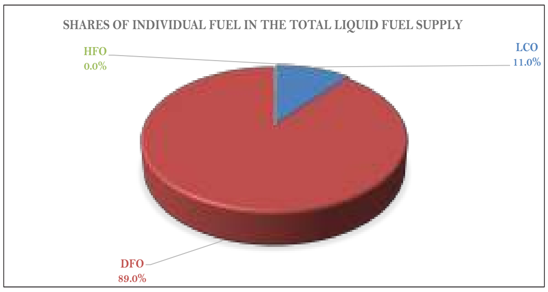


Figure 5a: Electricity Supply by sources

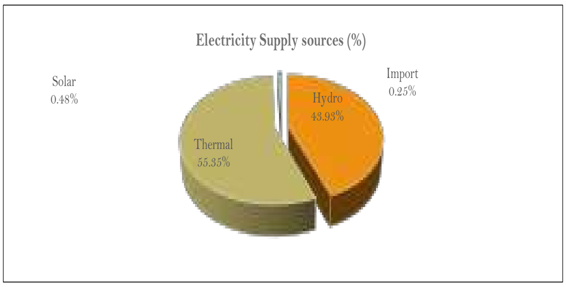
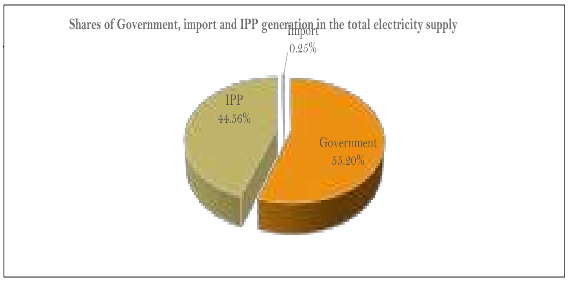


Figure 5b: Electricity supply by ownership



Peak Electricity Supply for October 2022		
Source of Supply	Generation at System Peak Load (MW)	Generation at Ghana Peak Load (MW)
AKOSOMBO	773.00	751.00
KPONG	139.30	131.90
BUI	397.20	401.50
BUI Solar	-	-
SEAP	544.80	540.10
TAPCO	210.70	297.90
TICO	331.90	327.30
TT1PP	107.00	107.00
CENIT	-	-
TT2PP	11.60	10.70
TWIN CITY	204.00	205.40
KARPOWER	368.80	311.40
AMERI	-	-
KTPP	-	-
Trojan Power	-	-
CENPOWER	-	-
AKSA	115.10	96.90
Bridge Power	-	-
IMPORT	-	-
Export to CIE at peak	64.00	18.00
Export to CEB at peak	180.00	87.00
Export to Sonabel	121.00	166.00
System Coincident Peak Load	**3,203.40**	
Ghana Coincedent Peak Load		**2,910.10**

OPERATIONAL FACT SHEET

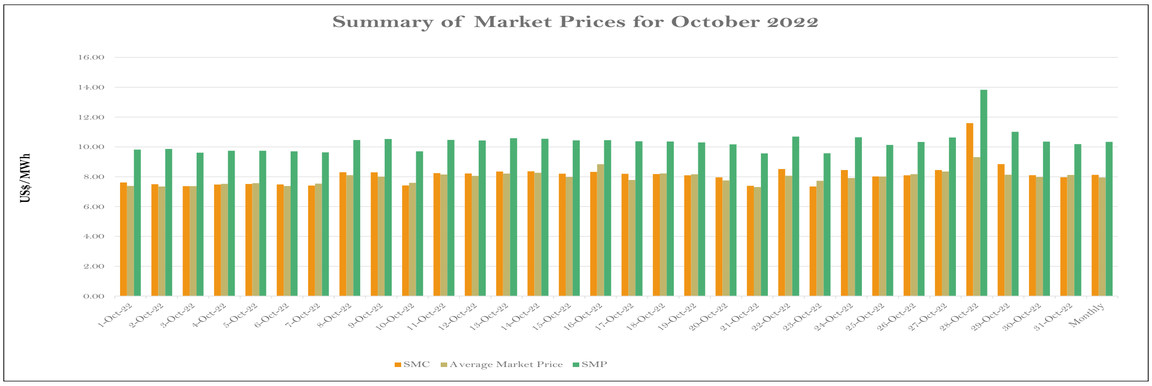
Hydro Dam Water level for October, 2022			
	Beginning month (ft)	End month (ft)	Change in water level
Hydro Dam			(feet)
Akosombo	268.45	274.20	5.75
Bui	589.73	598.92	9.19

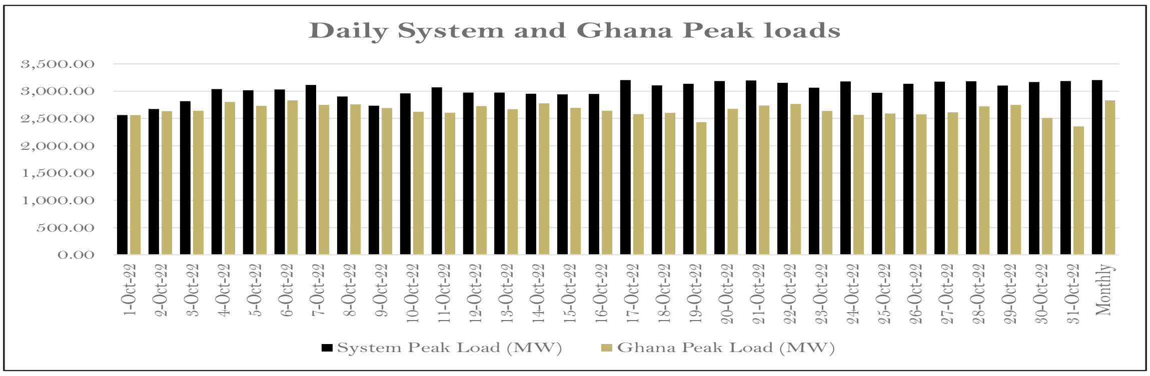
October, 2022 Average Monthly Natural Gas Flowrate (MMSCFD)	
Location	**Monthly Average**
Etoki	**28.50**
Tema WAGPCo	**100.54**
Aboadze WAGPCo	**138.71**
Eni	**177.51**
Ghana Gas	**104.36**
Reverse Flow	**84.89**

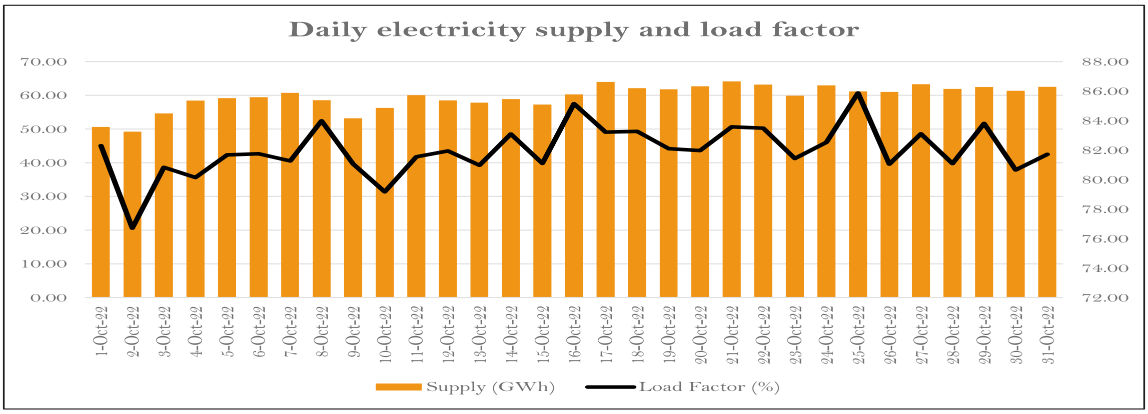
	Weekly Electricity Supply (GWh)				
	Week 1	Week 2	Week 3	Week 4	Total
AKOSOMBO	94.24	92.30	100.17	151.29	438.00
KPONG	17.44	15.91	16.81	25.13	75.28
BUI Hydro	66.09	67.11	66.74	95.16	295.09
Bui Solar	1.44	1.28	1.66	2.62	7.00
VRA Kaleo	0.40	0.42	0.42	0.61	1.85
SAPP	42.06	89.27	88.87	126.68	346.87
TAPCO	50.65	33.62	34.10	46.76	165.13
TICO	42.45	49.72	53.98	73.08	219.24
TT1PP	0.01	2.81	8.12	14.95	25.89
CENIT	0.00	0.00	0.00	0.00	0.00
TT2PP	1.90	1.94	1.96	0.67	6.47
Twin City	32.27	31.32	32.63	45.49	141.70
KARPOWER	11.56	11.74	20.43	27.05	70.79
AMERI	0.00	0.00	0.00	0.00	0.00
KTPP	0.00	0.00	0.28	0.75	1.03
Cenpower	27.24	0.00	0.00	0.00	27.24
AKSA	2.79	4.29	5.45	8.57	21.11
Bridge Power	0.00	0.00	0.00	0.00	0.00
Import	1.66	1.42	0.56	0.87	4.51
Total	**392.20**	**403.15**	**432.17**	**619.68**	**1,847.20**

		Fuel Consumption (MMBtu)			
	Heat rate (Btu/kWh)	Natural gas	LCO	HFO	DFO
TAPCO	10,691.87	1,765,506.00	-	-	-
TICO	7,998.51	1,752,007.37	1,567.70	-	-
SAPP	8,175.43	2,835,828.68	-	-	-
TT2PP	11,838.32	76,540.64	-	-	-
TT1PP	12,805.09	331,523.72	-	-	-
CENIT	-	-	-	-	-
KARPOWERSHIP	7,536.31	533,471.57	-	-	-
AMERI PLANT	-	-	-	-	-
KPONE THERMAL	12,293.80	-	-	-	12,687.21
CENPOWER	7,918.34	215,714.71	-	-	-
AKSA ENERGY	8,577.40	181,071.51	-	-	-
Twin City	7,579.99	1,074,053.64	-	-	-
Bridgepower	-	-	-	-	-

ECONOMIC FACT SHEET







Monthly Average Electricity Prices in the WEM				
		Oct-22	Sep-22	Change
Average Market Price (AMP)	US$/MWh	79.52	81.15	-1.63
System Marginal Cost (SMC)	US$/MWh	81.27	82.88	-1.61
System Marginal Price (SMP)	US$/MWh	103.38	105.95	-2.57

	Month Average fuel prices					
	Gazetted Natural Gas Price	Weighted average natural gas price	LCO	HFO	DFO	LPG
US$/MMBtu	5.97	6.18	18.58	15.02	38.48	12.76

Power Plants	Average fuel price (US$/MMBtu)
TAPCO	5.97
TICO	5.98
SAPP	5.97
TT2PP	5.97
TT1PP	5.97
CENIT	0.00
KARPOWERSHIP	5.97
AMERI PLANT	0.00
KPONE THERMAL	38.48
CENPOWER	5.97
AKSA ENERGY	5.97
Twin City	5.97
Bridgepower	0.00

Monthly Market Data Analysis for November 2022

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

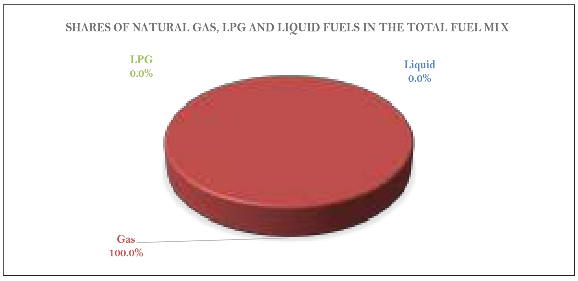


Figure 6b: Shares of fuel types in the generation fuel mix of power generation

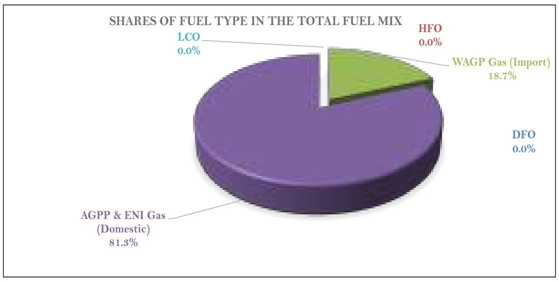


Figure 7a: Contribution of Natural Gas Supply by sources

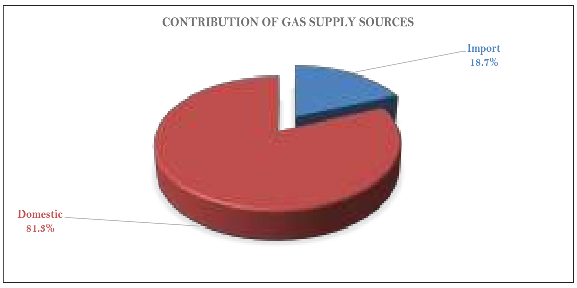


Figure 7b: Contribution of individual fuel in the liquid fuel supply

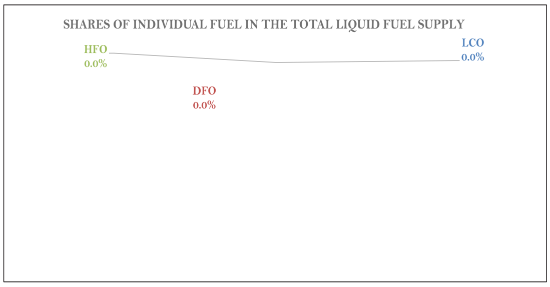


Figure 8a: Electricity Supply by sources

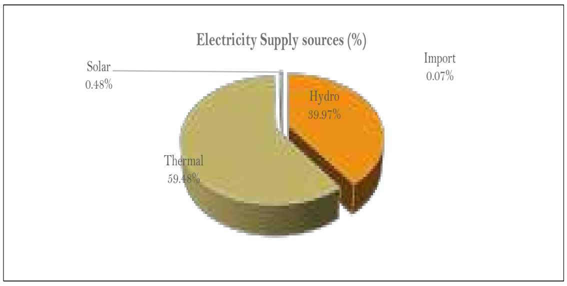
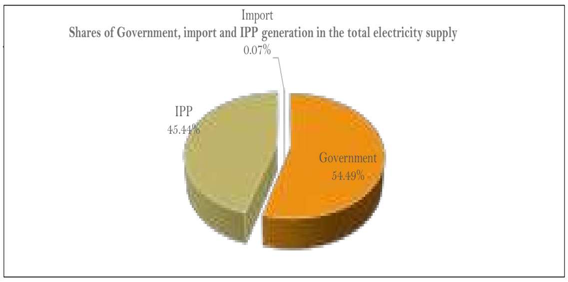


Figure 8b: Electricity supply by ownership



Peak Electricity Supply for November 2022		
Source of Supply	**Generation at System Peak Load (MW)**	**Generation at Ghana Peak Load (MW)**
AKOSOMBO	800.40	779.60
KPONG	132.30	138.00
BUI	394.30	392.90
BUI Solar	-	-
SEAP	536.40	536.60
TAPCO	317.00	314.00
TICO	326.00	325.00
TT1PP	-	-
CENIT	-	-
TT2PP	10.50	10.50
TWIN CITY	173.30	201.00
KARPOWER	447.30	165.10
AMERI	-	-
KTPP	103.00	104.00
Trojan Power	-	-
CENPOWER	-	179.00
AKSA	15.60	92.70
Bridge Power	-	-
IMPORT	-	-
Export to CIE at peak	68.00	114.00
Export to CEB at peak	95.00	32.00
Export to Sonabel	165.00	164.00
System Coincident Peak Load	**3,256.10**	
Ghana Coincedent Peak Load		**2,928.40**

OPERATIONAL FACT SHEET

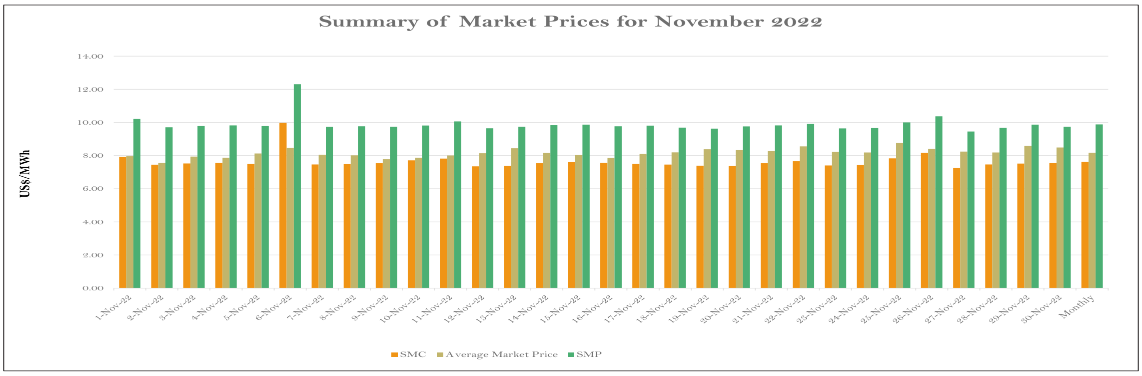
Hydro Dam Water level for November, 2022			
	Beginning month (ft)	End month (ft)	Change in water level
Hydro Dam			(feet)
Akosombo	274.20	273.78	-0.42
Bui	598.92	594.09	-4.82

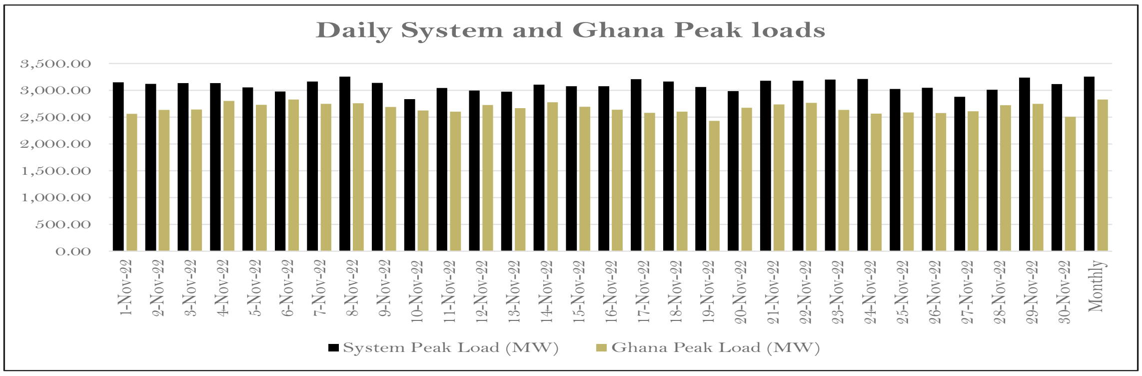
November, 2022 Average Monthly Natural Gas Flowrate (MMSCFD)	
Location	Monthly Average
ENI	176.17
Etoki	51.86
Tema WAGPCo	129.26
Aboadze WAGPCo	141.09
Ghana Gas	101.66
Reverse Flow	86.50

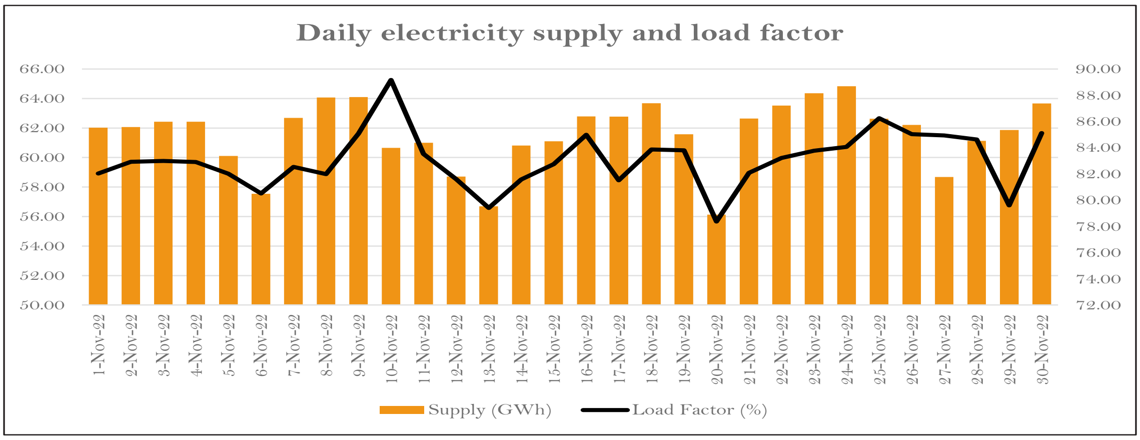
	Weekly Electricity Supply (GWh)				
	Week 1	Week 2	Week 3	Week 4	Total
AKOSOMBO	104.75	101.91	111.46	149.79	467.91
KPONG	17.10	17.40	19.52	24.67	78.69
BUI Hydro	60.54	49.65	37.07	45.08	192.34
Bui Solar	1.64	1.68	1.82	2.05	7.20
VRA Kaleo	0.39	0.39	0.40	0.46	1.64
SAPP	79.63	88.43	85.56	112.86	366.47
TAPCO	34.07	52.38	52.13	56.02	194.60
TICO	52.04	51.09	51.33	67.95	222.42
TT1PP	1.15	0.00	0.00	0.40	1.55
CENIT	0.00	0.00	2.65	2.04	4.68
TT2PP	0.88	0.75	0.13	0.35	2.10
Twin City	32.20	30.35	23.52	41.08	127.16
KARPOWER	18.39	13.55	8.26	7.50	47.71
AMERI	0.00	0.00	0.00	0.00	0.00
KTPP	12.63	13.22	17.17	18.42	61.44
Cenpower	5.17	0.00	14.10	28.60	47.87
AKSA	8.18	4.96	5.22	5.38	23.76
Bridge Power	0.00	0.00	0.00	0.00	0.00
Import	0.47	0.27	0.36	0.20	1.30
Total	429.25	426.03	430.68	562.87	1,848.83

		Fuel Consumption (MMBtu)			
	Heat rate (Btu/kWh)	Natural gas	LCO	HFO	DFO
TAPCO	8,871.17	1,726,293.29	-	-	-
TICO	8,193.61	1,822,394.01	-	-	-
SAPP	8,196.13	3,003,652.84	-	-	-
TT2PP	11,403.88	23,977.79	-	-	-
TT1PP	13,273.10	20,573.30	-	-	-
CENIT	11,899.87	55,702.08	-	-	-
KARPOWERSHIP	8,198.95	391,134.77	-	-	-
AMERI PLANT	-	-	-	-	-
KPONE THERMAL	11,588.44	711,950.67	-	-	-
CENPOWER	8,244.26	394,666.69	-	-	-
AKSA ENERGY	8,900.68	211,438.38	-	-	-
Twin City	7,888.63	1,003,129.50	-	-	-
Bridgepower	-	-	-	-	-

ECONOMIC FACT SHEET







	Month Average fuel prices					
	Gazetted Natural Gas Price	Weighted average natural gas price	LCO	HFO	DFO	LPG
US$/MMBtu	5.97	6.34	18.22	14.25	38.48	15.29

Monthly Average Electricity Prices in the WEM				
		Nov-22	Oct-22	Change
Average Market Price (AMP)	US$/MWh	81.74	79.52	2.22
System Marginal Cost (SMC)	US$/MWh	76.29	81.27	-4.98
System Marginal Price (SMP)	US$/MWh	98.85	103.38	-4.53

Power Plants	Average fuel price (US$/MMBtu)
TAPCO	5.97
TICO	5.97
SAPP	5.97
TT2PP	5.97
TT1PP	5.97
CENIT	5.97
KARPOWERSHIP	5.97
AMERI PLANT	0.00
KPONE THERMAL	5.97
CENPOWER	5.97
AKSA ENERGY	5.97
Twin City	5.97
Bridgepower	0.00

Monthly Market Data Analysis for December 2022

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

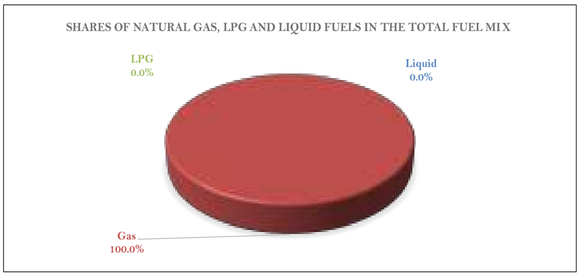


Figure 9b: Shares of fuel types in the generation fuel mix of power generation

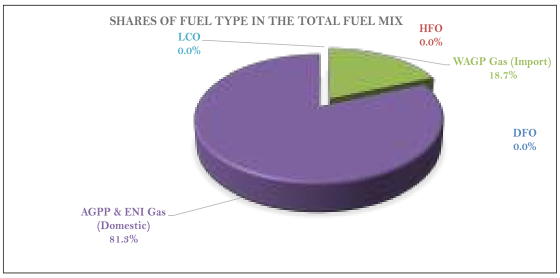


Figure 10a: Contribution of Natural Gas Supply by sources

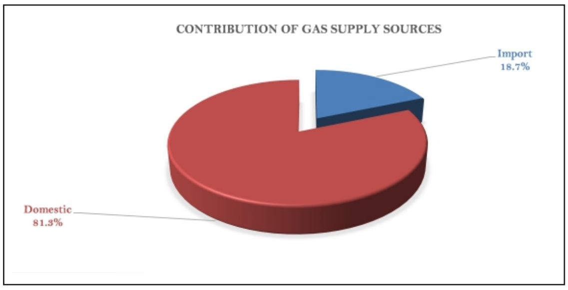


Figure 10b: Contribution of individual fuel in the liquid fuel supply

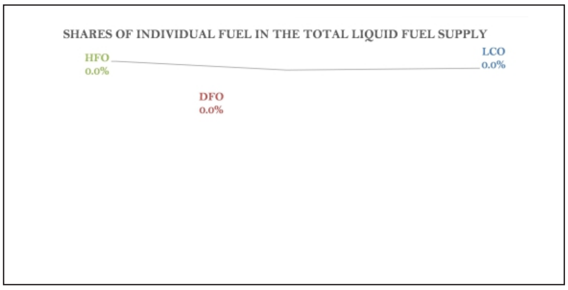


Figure 11a: Electricity Supply by sources

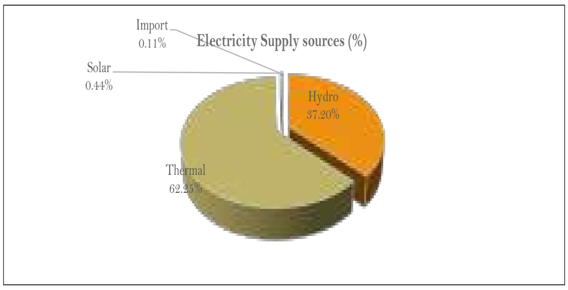
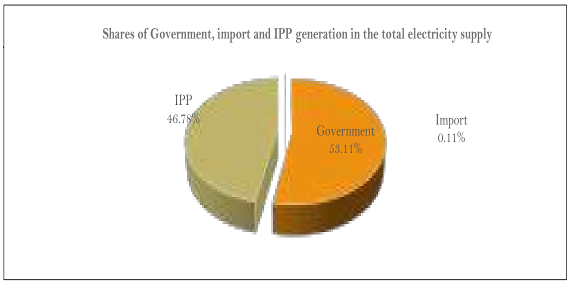


Figure 11b: Electricity supply by ownership



Peak Electricity Supply for December 2022		
Source ofSupply	Generation at System Peak Load (MW)	Generation at Ghana Peak Load (MW)
AKOSOMBO	949.90	949.90
KPONG	137.60	137.60
BUI	393.80	393.80
BUI Solar	-	-
SEAP	534.30	534.30
TAPCO	152.90	152.90
TICO	327.30	327.30
TT1PP	106.00	106.00
CENIT	-	-
TT2PP	21.60	21.60
TWIN CITY	203.30	203.30
KARPOWER	256.90	256.90
AMERI	-	-
KTPP	-	-
Trojan Power	-	-
CENPOWER	184.00	184.00
AKSA	103.20	103.20
Bridge Power	-	-
IMPORT	-	-
Export to CIE at peak	106.00	106.00
Export to CEB at peak	71.00	71.00
Export to Sonabel	144.00	144.00
System Coincident Peak Load	3,370.80	
Ghana Coincedent Peak Load		3,049.80

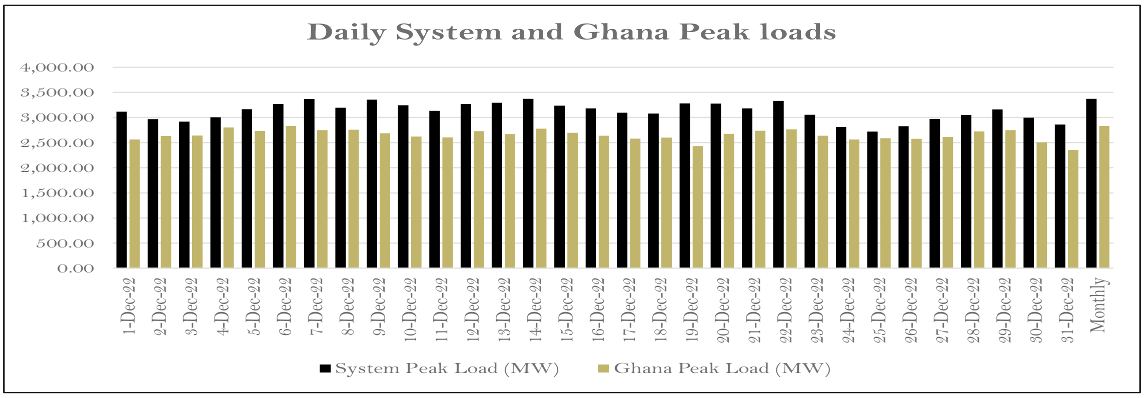
OPERATIONAL FACT SHEET

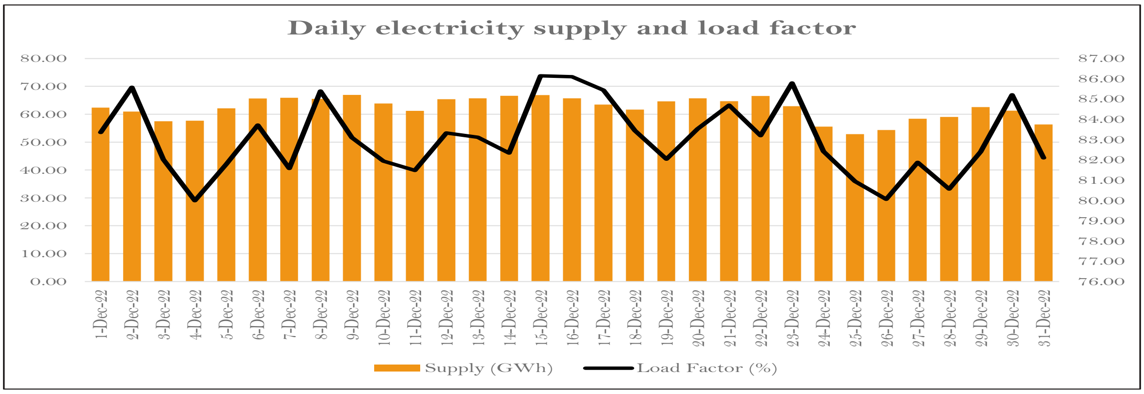
Hydro Dam Water level for December, 2022			
	Beginning month (ft)	End month (ft)	Change in water level
Hydro Dam			(feet)
Akosombo	273.78	272.58	-1.20
Bui	598.92	588.58	-10.34

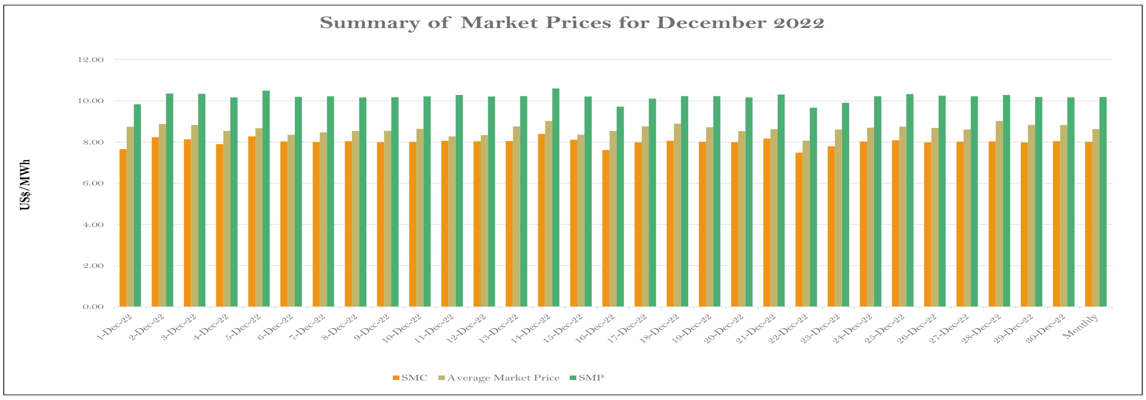
December, 2022 Average Monthly Natural Gas Flowrate (MMSCFD)	
Location	Monthly Average
ENI	204.42
Etoki	44.99
Tema WAGPCo	145.90
Aboadze WAGPCo	148.70
Ghana Gas	101.53
Reverse Flow	97.58

	Weekly Electricity Supply (GWh)				
	Week 1	Week 2	Week 3	Week 4	Total
AKOSOMBO	109.92	121.14	114.70	143.28	489.04
KPONG	18.47	19.45	18.73	22.31	78.96
BUI Hydro	39.76	37.46	31.48	41.23	149.93
Bui Solar	1.53	1.52	1.56	2.26	6.87
VRA Kaleo	0.29	0.37	0.33	0.54	1.53
SAPP	86.82	87.36	83.43	122.91	380.52
TAPCO	45.34	48.08	51.67	73.17	218.26
TICO	40.65	52.11	50.45	74.23	217.44
TT1PP	11.74	17.83	15.63	21.82	67.02
CENIT	2.24	2.21	0.75	0.00	5.20
TT2PP	1.91	3.62	1.93	0.18	7.64
Twin City	31.34	29.51	26.50	44.18	131.53
KARPOWER	16.86	7.71	19.79	9.20	53.56
AMERI	0.00	0.00	0.00	0.00	0.00
KTPP	4.82	0.00	0.84	0.00	5.66
Cenpower	16.16	21.65	28.83	26.75	93.39
AKSA	4.22	4.83	5.72	6.78	21.55
Bridge Power	0.00	0.00	0.00	0.00	0.00
Import	0.18	0.38	0.58	1.01	2.15
Total	**432.25**	**455.23**	**452.92**	**589.85**	**1,930.25**

		Fuel Consumption (MMBtu)			
	Heat rate (Btu/kWh)	Natural gas	LCO	HFO	DFO
TAPCO	8,870.59	1,936,095.07	-	-	-
TICO	8,635.99	1,877,809.40	-	-	-
SAPP	8,187.88	3,115,650.30	-	-	-
TT2PP	11,714.86	89,501.54	-	-	-
TT1PP	12,782.69	856,696.04	-	-	-
CENIT	11,316.96	58,848.18	-	-	-
KARPOWERSHIP	8,136.95	435,815.03	-	-	-
AMERI PLANT	-	-	-	-	-
KPONE THERMAL	11,004.71	62,286.65	-	-	-
CENPOWER	7,952.86	742,717.46	-	-	-
AKSA ENERGY	9,076.10	195,589.86	-	-	-
Twin City	7,854.17	1,033,059.59	-	-	-
Bridgepower	-	-	-	-	-







Monthly Average Electricity Prices in the WEM				
		Dec-22	Nov-22	Change
Average Market Price (AMP)	US$/MWh	86.33	81.74	4.59
System Marginal Cost (SMC)	US$/MWh	80.06	76.29	3.77
System Marginal Price (SMP)	US$/MWh	101.88	98.85	3.03

	Month Average fuel prices					
	Gazetted Natural Gas Price	Weighted average natural gas price	LCO	HFO	DFO	LPG
US$/MMBtu	5.97	6.38	16.24	13.10	30.56	20.18

Power Plants	Average fuel price (US$/MMBtu)
TAPCO	5.97
TICO	5.97
SAPP	5.97
TT2PP	5.97
TT1PP	5.97
CENIT	5.97
KARPOWERSHIP	5.97
AMERI PLANT	0.00
KPONE THERMAL	5.97
CENPOWER	5.97
AKSA ENERGY	5.97
Twin City	5.97
Bridgepower	0.00

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Acronyms

AGPP = Atuabu Gas Processing Plant
CBGC = Composite Bulk Generation Charge
DFO = Distillate Fuel Oil
ECG = Electricity Company of Ghana
ESP – Electricity Supply Plan
GHp = 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, Enyenra, 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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