



GHANA WHOLESAL ELEC TRICIT Y MARKET BULLETIN

MARKET WATCH

Monthly Market Data Analysis

ISSUE NO. 53

1st May 2020 to 31st May 2020

This Bulletin covers major developments in the Wholesale Electricity Market (WEM) of Ghana from 1st May, 2020 to 31st May, 2020. It analyses the performance of the key WEM indicators against their benchmarks, and examines the likely implications of any discernable trends in the market. This edition of the WEM bulletin analysis the electricity traded in the Ghana Wholesale Electricity Market for May 2020.

The Electricity Market Oversight Panel (EMOP) would very much appreciate and welcome comments from readers on the Bulletin. 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.

HIGHLIGHTS OF THE MONTH

There was an increase of 4.5% in the System Peak Load for May 2020, from 2,824.4 MW in April 2020 to 2950.2 MW. The System Peak Load recorded in May 2020 was 3.4% lower than the 3,054 MW projected in the 2020 Electricity Supply Plan (ESP). The total electricity exported to the neighbouring countries was 343 MW which was 3.9% higher than the 330 MW projected in the 2020 ESP. However, there was no electricity import at the System Peak Load for May 2020. The Ghana Peak Load of 2,626.3 MW recorded for May 2020 was 3.1% higher than the 2,546.4 MW recorded in April 2020. On the contrary, the Ghana Peak Load recorded for May 2020 was 3.6% lower than the 2,724 MW projected in the 2020 ESP. The average electricity demand increased by 3.8%, from 2,289.37 MW in April 2020 to 2,378.16 MW in May 2020.

The average electricity supplied in May 2020 increased by 3.8%, from 54.94 GWh per day in April 2020 to 57.08 GWh per day. Similarly, the total electricity supplied increased by 7.3%, from 1,648.35 GWh in April 2020 to 1,769.25 GWh in May 2020. Out of the total electricity supplied in May 2020, 6.39 GWh was imported from CIE while the remaining 1,762.96 GWh was supplied from domestic sources. A total of 149.52 GWh was exported to CIE, CEB and SONABEL in May 2020.

The electricity generated from the hydroelectric power plants contributed 34.9% of the total electricity supplied in May 2020, which was marginally higher than the 34.2% recorded in April 2020. The share of the electricity supplied by the thermal power plants constituted 64.8% of the total electricity supplied in May 2020. Electricity

Table 1. Projected and Actual Outturn of electricity demand and supply in May 2020 and April 2020.

	May 2020		April 2020	
	Projected	Actual Outturn	Projected	Actual Outturn
Total Supply (GWh)	1,685.3	1,640.4	1,674.2	1,648.3
Source by Power Plants (GWh)				
AKOSOMBO	375.0	328.1	363.0	387.7
KPONG	68.0	64.3	70.0	73.1
BUI	42.0	92.9	75.0	104.9
Sunon Asogli	275.0	346.3	266.0	250.6
TAPCO	84.0	106.3	81.0	103.8
TICO	195.0	105.7	189.0	154.6
TT1PP	27.0	6.4	32.0	36.4
CENIT	77.0	73.9	74.0	67.6
TT2PP	-	8.7	-	15.7
Amandi	71.0	-	68.0	4.6
Karpowership	268.0	267.6	259.0	238.7
AMERI	125.0	116.2	121.0	116.1
KITPP	74.0	63.9	72.0	31.8
Trojan Power	-	-	-	-
CENPOWER	-	-	-	-
AKSA	-	11.3	-	17.4
Bridge Power	-	-	-	-
BXC Solar	2.0	2.4	2.0	2.5
Safisana	-	-	-	-
VRA Solar	0.3	0.2	0.2	0.2
Genser	-	38.7	-	36.8
Meinergy	2.0	1.9	2.0	2.2
Total Generation (GWh)	1,685.3	1,634.9	1,674.2	1,644.5
Imports (GWh)	-	5.5	-	3.9
Total Supply (GWh)	1,685.3	1,640.4	1,674.2	1,648.3
Deficit/Over supply (GWh)	-	(44.9)	-	(25.9)
Ghana Coincident Peak Load (MW)	2,724.0	2,666.3	2,763.0	2,546.4
System Coincident Peak Load (MW)	3,054.0	2,870.3	3,093.0	2,824.4

HIGHLIGHTS OF THE MONTH

supplied from the renewable power plants in May 2020 contributed 0.3% which was the same for April 2020.

The rate of drop in the water level for the Akosombo GS increased in May 2020 from 0.03 feet per day in April 2020 to 0.04 feet per day by 33.3%. On the contrary, the rate of drop in the water level for the Bui GS decreased by 5.3%, from 0.19 feet per day in April 2020 to 0.18 feet per day in May 2020.

The consumption of Natural gas continued to dominate the total fuel mix in May 2020 with a share of 97.5% which was lower than the 98.6% recorded in April 2020.

Natural gas supply contributed 98.6% of the total fuel consumed by thermal power plants in April 2020. Liquid fuel accounted for 1.4% of the total fuel consumption in April 2020. Domestic natural gas supply accounted for 78.5% of the total natural gas consumption and 77.3% of the total fuel consumed in April 2020. Natural gas import accounted for 21.5% of the total natural gas consumed and 21.2% of the total fuel consumed in April 2020. HFO accounted for 97.6% of the total liquid fuel consumed in April 2020 and 1.4% of the total fuel consumed.

ELECTRICITY DEMAND AND SUPPLY

Electricity Demand

The System Peak Load of 2,950.23 MW recorded in May 2020 was 4.5% higher than the 2,824.4 MW recorded in April 2020. On the contrary, the System Peak Load recorded in May 2020 was 3.4% lower than the 3,054 MW projected in the 2020 ESP. The total electricity exported to CIE, CEB and SONABEL at the System Peak Load in May 2020 was 343 MW which was 3.9% higher than the 330 MW projected in the 2020 ESP. However, there was no electricity import at the System Peak Load for May 2020. The Ghana Peak Load in May 2020 increased by 3.1%, from 2,546.4 MW in April 2020 to 2,626.34 MW. In comparison, the Ghana Peak Load recorded in May 2020 was 3.6% lower than the 2,724 MW projected in the 2020 ESP. The electricity generated from the hydroelectricity power plants contributed 37.7% of the System Peak Load and 41.6% of the Ghana Peak Load in May 2020. The average electricity supplied in May 2020 increased by 3.8% to 2,378.16 MW, from 2,289.37 MW in April 2020. The System Load Factor recorded in May 2020 decreased from 79% in April 2020 to 78.6%.

Electricity supply

There was an increase of 3.8% in the average electricity supplied in May 2020, from 54.94 GWh per day in April 2020 to 57.06 GWh per day. Similarly, the total electricity supplied in May 2020 increased by 7.3%, from 1,648.35 GWh in April 2020 to 1,769.35 GWh. An amount of 1,762.96 GWh of electricity was supplied from domestic power plants for both domestic consumption and export and this was augmented by 6.39 GWh of imported from CIE in May 2020. Electricity export to CIE, CEB and SONABEL was 149.52 GWh in May 2020. Of this total, 9.9 GWh was supplied to CIE, 51.64 GWh to CEB and 87.98 GWh to SONABEL in May 2020. The total electricity supplied for domestic consumption increased by 8%, from 1,499.06 GWh in April 2020 to 1619.21 GWh in May 2020. The electricity supplied from the hydroelectric sources contributed 34.9% of the total electricity supplied in May 2020 which was higher than the 34.3% recorded in April 2020. Thermal generation accounted for 64.8% of the total electricity supplied in May 2020 which was lower than the 65.2% recorded in April 2020. The share of the electricity supplied by solar power plants continued to be 0.3% of the total electricity supply.

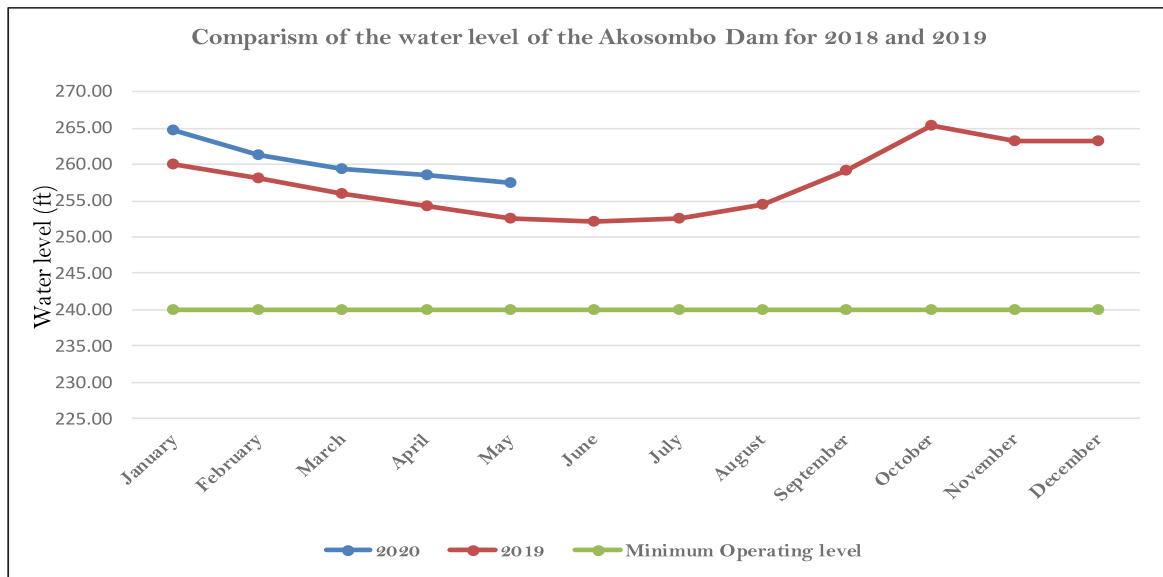
HYDRO DAM LEVELS

Akosombo Dam Water Level continued to drop in May 2020

The rate of drop in the water level for the Akosombo dam increased by 33.3% in May 2020, from 0.032 feet per day in April 2020 to 0.035 feet per day. Consequently, the water level of 258.5 feet recorded at the beginning of May 2020 reduced by 1.09 feet to a month end water level of 257.41 feet. As at the end of May 2020, the water level recorded was 4.77 feet above the water level recorded for the same period in 2019. Also, the water level recorded at the end of May 2020 was 17.41 feet above the minimum operating level.

HIGHLIGHTS OF THE MONTH

Figure 1: Month-End Water Level for Akosombo Dam from January 2019 to May 2020.

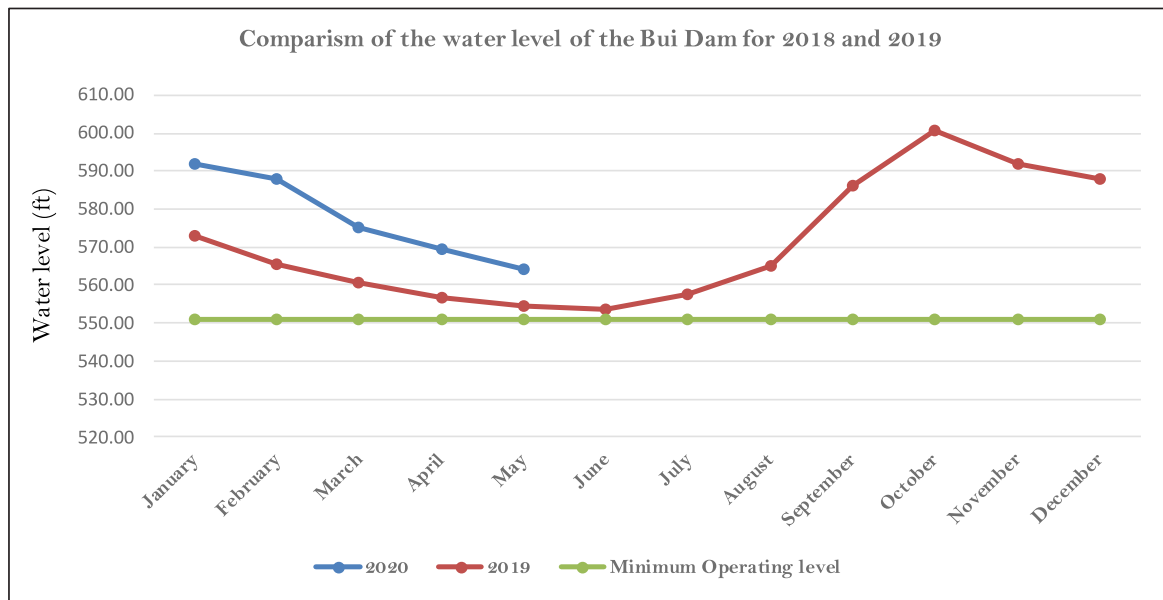


Bui Dam Water Level continued to drop but at a reduced rate in May 2020

The rate of drop in the water level for the Bui dam reduced by 5.3% in May 2020, from 0.19 feet per day in April 2020 to 0.18 feet per day. The water level of 569.55 feet recorded at the beginning of May 2020 dropped by 5.54 feet to a month end water level of 564.01 feet. The water level recorded at the end of May 2020 was 9.55 feet above the water level recorded for the same period in 2019 and was 12.83 feet above the minimum operating water level for the dam.

Figure 2 shows comparative end of month trajectory of the level of water in the Bui dam from January 2019 to May 2020.

Figure 2: Month-End Water Level for Bui Dam from January 2019 to May 2020



FUEL SUPPLY FOR POWER GENERATION

Natural gas imports from West Africa Gas Pipeline Company (WAPCo) increased in May 2020

The average natural gas flow rate from WAPCo in May 2020 increased by 8.9%, from 60.2 MMSCFD in April 2020 to 65.56 MMSCFD. Consequently, the total natural gas supplied by WAPCo increased from 1,882.97 MMSCF in April 2020 to 1,966.8 MMSCF in May 2020. The increased natural gas supplied by WAPCo lead to a relative increase in its share in the total fuel mix from 19.6% in April 2020 to 20.6% in May 2020. Also, the share of the total natural gas supplied by WAPCo in the total natural gas consumed increased from 19.9% in April 2020 to 21.1% in May 2020.

Natural gas supply from domestic sources decreased in May 2020

Natural gas supplied from domestic sources averaged 236.89 MMSCFD in May 2020 which represents a reduction of 4.9% from the 249.18 MMSCFD recorded in April 2020. Similarly, the total natural gas supplied from domestic sources reduced from 7,475.45 MMSCF in April

HIGHLIGHTS OF THE MONTH

2020 to 7,343.5 MMSCF in May 2020. The share of the natural gas supplied from domestic sources in the total fuel mix reduced from 78.9% in April 2020 to 76.9% in May 2020. In the total natural gas consumed in May 2020, the share of the total natural gas supplied from domestic sources reduced from 80.1% in April 2020 to 78.9%.

Liquid Fuel consumption increased in May 2020

Liquid fuel consumption increased significantly by 81% in May 2020, from 24,974 barrels in April 2020 to 45,252 barrels. The increase in the liquid fuel consumption was due to increased generation from AKSA in May 2020. The share of the total liquid fuel consumed in the total fuel mix increased from 1.5% in April 2020 to 2.5% in May 2020.

The share of the total HFO consumed in May 2020 in the total fuel mix increased from 1.4% in April 2020 to 1.7%. Similarly, the share of the total HFO consumed increased to 69.6% in May 2020 from 94.9% in April 2020. DFO consumption increased in May 2020 which resulted in an increase in its share in the total fuel mix from 0.1% in April 2020 to 0.8%. Similarly, the share of DFO in the total liquid fuel increased from 5.1% in April 2020 to 30.4% in May 2020.

Plant by Plant Highlights

Electricity Generation at the Akosombo Generation Station (GS) increased in May 2020

The Akosombo GS recorded an increase in the average electricity supplied by 8.1%, from 12.92 GWh per day in April 2020 to 13.96 GWh per day in May 2020. Similarly, the total electricity supplied by the hydroelectric power plant increased by 11.7%, from 387.72 GWh in April 2020 to 432.88 GWh in May 2020. The total electricity supplied by Akosombo GS constituted 24.5% of the total electricity supplied in May 2020 and was 15.4% higher than the 375 GWh projected in the 2020 ESP. The hydroelectric power plant contributed 782.69 MW and 862.66 MW to the System Peak Load and the Ghana Peak Load respectively in May 2020. The electricity supplied by the Akosombo GS at the System Peak Load and the Ghana Peak constituted 26.5% and 30.6% of the respective peak loads.

Electricity supply by Kpong Generation Station (GS) increased in May 2020

The average electricity supplied by the Kpong GS increased in May 2020 by 3.7%, from 2.44 GWh per day in April 2020 to 3.74 GWh per day. Likewise, the total electricity of 78.38 GWh supplied by the hydro power plant in May 2020 was 7.2% higher than the 73.11 GWh in April 2020. The total electricity supplied by Kpong GS constituted 4.4% of the total electricity supplied in May 2020 and was 15.3% higher than the 68 GWh projected in the 2020 ESP. The Kpong GS contributed 117.03 MW to the System Peak Load and 106.1 MW to the Ghana Peak Load, representing 4% and 3.8% of the respective peak loads in May 2020.

Electricity supply by the Bui Generation Station (GS) decreased in May 2020.

The average electricity supplied by the Bui GS decreased marginally by 1.4%, from 3.5 GWh per day in April 2020 to 3.45 GWh per day in May 2020. However, the total electricity supplied by the Bui GS increased by 1.9%, from 104.85 GWh per day in April 2020 to 106.83 GWh per day in May 2020. The increase in the total electricity supplied was as a result of greater number of days in May. The total electricity supplied by the hydroelectric power plant constituted 6% of the total electricity supplied in May 2020 and was over 100% more than the 42 GWh projected in the 2020 ESP. The Bui GS contributed 211.78 MW to the System Peak Load and 204.9 MW to the Ghana Peak Load, representing 7.2% and 7.3% of the respective loads in May 2020.

The Sunon Asogli Power Plant (SAPP) increased generation in May 2020

The Sunon Asogli Power Plant (SAPP) recorded an increase in the average electricity supplied in May 2020 by 1.3%, from 8.35 GWh per day in April 2020 to 8.46 GWh per day. Similarly, the total electricity supplied by SAPP increased by 4.6%, from 250.6 GWh in April 2020 to 262.18 GWh in May 2020. The total electricity supplied by the thermal power plant constituted 14.8% of the total electricity supplied in May 2020 and was 4% lower than the 273 GWh projected in the 2020 ESP. SAPP contributed 433.1 MW and 342.8 MW to the System Peak Load and the Ghana Peak Load, representing 14.7% and 12.2% of the respective peak loads in May 2020. A total of 1,897.1 MMSCF of natural gas was consumed by the thermal power plant, at an estimated heat rate of 7,723.97 Btu/kWh in May 2020 which was lower than the 8,252.12 Btu/kWh recorded in April 2020.

Ameri Energy Power Plant's generation decreased in May 2020

The average electricity supplied by the Ameri power plant reduced marginally by 1.8%, from 3.87 GWh per day in April 2020 to 3.8 GWh per day in May 2020. On the contrary, the total electricity supplied by the Ameri power plant increased marginally by 1.5%, from 116.1 GWh in April 2020 to 117.82 GWh in May 2020. The increase in the total electricity supplied by the thermal power plant was as a result of greater number of days in May than in April. The total electricity supplied by the thermal power plant constituted 6.7% of the total electricity supplied in May 2020 and was 5.7% lower than the 125 GWh projected in the 2020 ESP. The Ameri power plant contributed 142.2 MW and 142.9 MW to the System Peak Load and the Ghana Peak Load, representing 4.8% and 5.1% of the respective peak loads in May 2020. A total of 1,177.29 MMSCF of natural gas was consumed by the thermal power plant at an estimated heat rate of 10,251.97 Btu/kWh in May 2020 which was higher than the 10,112.67 Btu/kWh recorded in April 2020.

The Karpowership Power Plant's generation increased in May 2020

The Karpowership recorded a marginal increase of 2% in the average electricity supplied in May 2020 from 7.96 GWh per day in April 2020 to 8.12 GWh per day. Similarly, the total electricity supplied by the power ship increased by 5.4%, from 238.66 GWh in April 2020 to 251.6 GWh in May 2020. The total electricity supplied by the thermal power plant constituted 14.2% of the total electricity supplied in May 2020 and was 6.1% lower than the 268 GWh projected in the 2020 ESP. Karpowership contributed 311.3 MW to the System Peak Load and 414.7 MW to the Ghana Peak Load, representing 10.6% and 14.7% of the respective peak loads in May 2020. The thermal power plant consumed a total of 1,827.03 MMSCF of natural gas at an estimated heat rate of 7,995.01 Btu/kWh in May 2020 which was lower than the 8,063.15 Btu/kWh recorded in April 2020.

AKSA Power Plant's generation increased in May 2020

There was an increase in the average electricity supplied by the AKSA power plant by 24.9%, from 0.58 GWh per day in April 2020 to 0.73 GWh per day in May 2020. Likewise, the total electricity supplied by the AKSA power plant increased by 29.1%, from 17.42 GWh in April 2020 to 22.49 GWh in May 2020. The total electricity supplied by the thermal power plant constituted 1.3% of the total electricity supplied in May 2020. The AKSA power plant was projected to be offline in May 2020. The thermal power plant contributed 154 MW to the System Peak Load and 257.9 MW to the Ghana Peak Load in May 2020. The total load supplied by AKSA constituted 5.2% of the System Peak Load and 9.1% of the Ghana Peak Load. A total of 30,350 barrels of HFO at an estimated heat rate of 8,164.23 Btu/kWh in May 2020 which was marginally lower than the 8,178.17 Btu/kWh recorded in April 2020.

HIGHLIGHTS OF THE MONTH

Takoradi International Company (TICO) generation decreased in May 2020

The TICO power plant recorded a reduction in the average electricity supplied in May 2020 by 5.3%, from 5.15 GWh per day in April 2020 to 4.88 GWh per day. Also, the total electricity supplied by the thermal power plant decreased by 2.1%, from 154.55 GWh in April 2020 to 151.32 GWh in May 2020. The total electricity supplied by the thermal power plant constituted 8.6% of the total electricity supplied in May 2020 and was 22.4% lower than the 195 GWh projected in the 2020 ESP. TICO contributed 218.67 MW and 217.13 MW to the System Peak Load and the Ghana Peak Load, representing 7.4% and 7.7% of the respective peak loads in May 2020. The thermal power plant consumed a total of 1,742.53 MMSCF of natural gas at an estimated heat rate of 11,814.9 Btu/kWh in May 2020. The heat rate recorded in May 2020 was higher than the 11,794.04 Btu/kWh in April 2020.

Takoradi Power Company (TAPCO) Plant's generation increased in May 2020

The average electricity generated by TAPCO decreased by 13.2%, from 3.53 GWh per day in March 2020 to 3.46 GWh per day in April 2020. The total electricity supplied by TAPCO decreased from 109.47 GWh in March 2020 to 103.77 GWh in April 2020. The total electricity generated by the thermal power plant constituted 6.3% of the total electricity supplied in April 2020 and was 28.1% higher than the 81 GWh projected in the 2020 ESP. The thermal power plant contributed 153 MW to both the System Peak Load and the Ghana Peak Load, representing 5.4% and 6% of peak loads in April 2020 respectively. A total of 828.51 MMSCF of natural gas was consumed by the thermal power plant at an estimated heat rate of 8,463.4 Btu/kWh in April 2020, which was lower than the 8,50339 Btu/kWh recorded in March 2020

CENIT Power Plant's increased its generation in May 2020.

The Average electricity supplied by the CENIT power plant increased by 10.8%, from 2.25 GWh per day in April 2020 to 2.5 GWh per day in May 2020. Similarly, the total electricity supplied by the thermal power plant increased by 14.5%, from 67.63 GWh in April 2020 to 77.44 GWh in May 2020. The total electricity supplied by the thermal power plant constituted 4.4% of the total electricity supplied in May 2020 and was 0.6% higher than the 77 GWh projected in the 2020 ESP. The CENIT power plant contributed 107 MW and 109 MW to the System Peak Load and the Ghana Peak Load, representing 3.6% and 3.9% of the respective peak loads in May 2020. A total of 751.97 MMSCF of natural gas was consumed by the thermal power plant at an estimated heat rate of 10,757.07 Btu/kWh in May 2020 which was lower than the 11,141.7 Btu/kWh recorded in April 2020.

Kpone Thermal Power Plant (KTPP) generation decreased in May 2020

The operation of KTPP in May was limited to 14 days in May 2020. Consequently, the total electricity generated by the thermal power plant reduced by 53.9%, from 31.78 GWh in April 2020 to 14.64 GWh in May 2020. The total electricity supplied by the thermal power plant constituted 0.8% of the total electricity supplied in May 2020 and was 80.2% lower than the 74 GWh projected in the 2020 ESP. KTPP did not contribute to both the System Peak Load and the Ghana Peak Load in May 2020. The thermal power consumed a total of 80.11 MMSCF of natural gas and 14,902 barrels of DFO at an estimated heat rate of 11,525.56 Btu/kWh in May lower than the 11,572.17 Btu/kWh recorded in April 2020.

Tema Thermal 1 Power Plant's (TT1PP) increased generation in May 2020

The TT1PP continued its operation in May 2020 but for a limited number of days. The power plant recorded an increase in the total electricity supplied by 43.8%, from 36.36 GWh in April 2020 to 52.27 GWh in May 2020. The total electricity supplied by the thermal power plant constituted 3% of the total electricity supplied in May 2020 and was 93.6% higher than the 27 GWh projected in the 2020 ESP. TT1PP contributed 104 MW to the System Peak Load which translates into 3.5% of the load in May 2020. The thermal power plant did not contribute to the Ghana Peak Load in May 2020. A total of 580.17 MMSCF of natural gas was consumed by the thermal power plant at an estimated heat rate of 12,296.94 Btu/kWh in May 2020 which was higher than the 12,079 Btu/kWh recorded in April 2020.

Embedded Electricity Generation

Genser Power Plant's generation increased in May 2020

There was a marginal increase in the average electricity supplied by the Genser power plant in May 2020 by 1.5%, from 1.23 GWh per day in April 2020 to 1.24 GWh per day. Similarly, the total electricity supplied by the thermal power plant increased by 1.5%, from 36.8 GWh per day in April 2020 to 38.59 GWh in May 2020. The total electricity supplied by the Genser power plant constituted 2.2% of the total electricity supplied in May 2020. A total of 396.73 MMSCF of natural gas was consumed by the thermal power plant at an estimated heat rate of 11,391.51 Btu/kWh in May 2020 which was lower than the 11,606.11 Btu/kWh recorded in April 2020.

BXC Solar generation increased in May 2020

The BXC solar power plant recorded an increase in the total electricity supplied in May 2020, from 2.47 GWh in April 2020 to 2.73 GWh by 10.6%. The total electricity supplied by the solar power plant constituted 0.2% of the total electricity supplied in May 2020 and was 36.6% higher than the 2 GWh projected in the 2020 ESP.

Meinergy Solar generation increased in May 2020

There was an increase of 16.6% in the total electricity supplied by the Meinergy solar power plant in May 2020. The total electricity supplied increased from 2.16 GWh in April 2020 to 2.52 GWh in May 2020. The total electricity supplied by the solar power plant was 26.1% higher than the 2 GWh projected in the 2020 ESP and constituted 1% of the total electricity supplied in May 2020.

VRA Navrongo Solar generation increased in May 2020

The VRA Navrongo solar recorded an increase in the total electricity supply by 7.2%, from 0.22 GWh in April 2020 to 0.24 GWh in May 2020. The solar power plant's total electricity supplied constituted 0.01% of the total electricity supplied in May 2020 and was 20.3% lower than the 0.3 GWh projected in the 2020 ESP.

Electricity Exchange – Import and Export increased in May 2020

There was a significant increase of 60.1% in the average electricity imported from 0.13 GWh per day in April 2020 to 0.21 GWh per day in May 2020. Likewise, the total electricity imported from CIE increased from 3.86 GWh in April 2020 to 6.39 GWh in May 2020. The total electricity imported constituted 0.4% of the total electricity supplied in May 2020.

There was a reduction in the average electricity exported to SONABEL, CEB and CIE by 3.1%, from 4.98 GWh per day in April to 4.82 GWh in May 2020. The average electricity exported to CIE and CEB decreased from 0.34 GWh per day and 1.84 GWh per day in April 2020 to 0.32 GWh per day and 1.67 GWh per day in May 2020 respectively. On the contrary, the average electricity supplied to SONABEL increased by 1.4%, from 2.8 GWh per day in April 2020 to 2.84 GWh per day in May 2020.

The total electricity exported to SONABEL, CEB and CIE increased marginally by 0.2%, from 137 GWh in April 2020 to 149.52 GWh in May 2020. The total electricity supplied to SONABEL increased by 4.8%, from 83.94 GWh in April 2020 to 87.98 GWh in May 2020. On the contrary, the total electricity exported to CIE and CEB decreased from 10.22 GWh and 55.13 GWh in April 2020 to 9.9 GWh and 51.64 GWh in May 2020 respectively.

Ghana continued to be a net exporter of electricity in May 2020.

OPERATIONAL FACT SHEET

Monthly Market Data Analysis

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

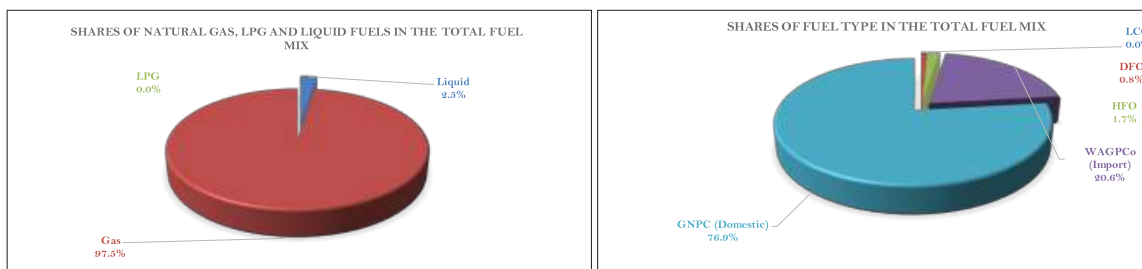
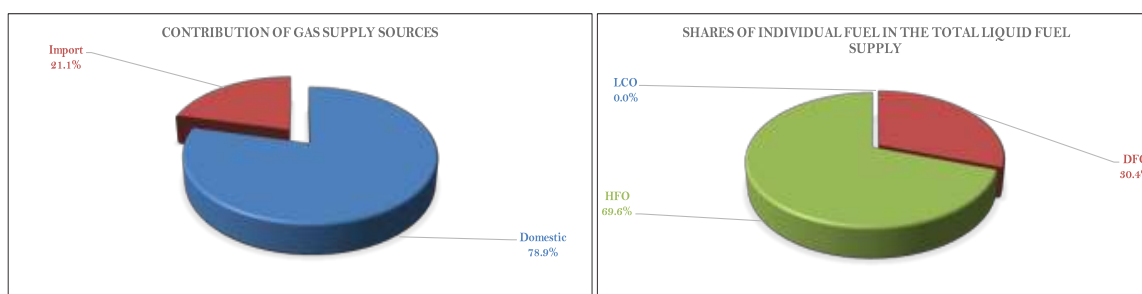


Figure 4a: Contribution of Natural Gas Supply by sources

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

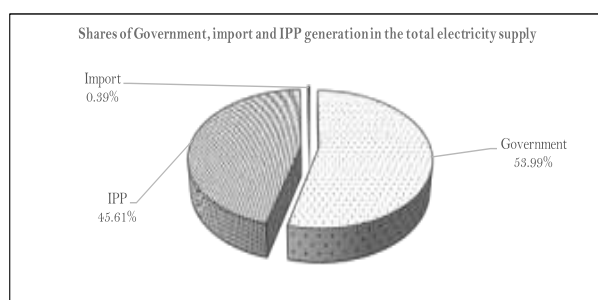
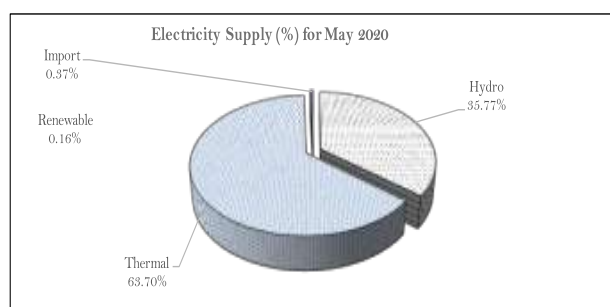


Peak Electricity Supply - May 2020			
Source of Supply	Generation at System Peak Load (MW)	Generation at Ghana Peak Load (MW)	Electricity Supply (GWh)
AKOSOMBO	782.69	862.66	432.88
KPONG	117.03	106.10	78.38
BUI	211.78	204.90	106.83
SEAP	433.10	342.80	262.18
TAPCO	150.96	100.25	108.90
TICO	218.67	217.13	151.32
TT1PP	104.00	-	52.27
CENIT	107.00	109.00	77.44
TT2PP	24.40	-	8.97
MRP	193.10	-	32.44
KARPOWER	311.30	414.70	251.60
AMERI	142.20	142.90	117.82
KTPP	-	-	14.64
Trojan Power	-	-	-
CENPOWER	-	-	0.72
AKSA	154.00	257.90	22.49
BXC Solar	-	-	-
Safisana	-	-	2.47
VRA Solar	-	-	-
Genser	-	-	0.24
IMPORT	-	63.00	38.59
Export to CIE at peak	2,950.23	2,821.34	2.16
Export to CEB at peak	56.00	-	6.39
Export to Sonabel	127.00	69.00	1,768.73
System Coincident Peak Load	160.00		
Ghana Coincedent Peak Load		2,626.34	
Total Supply			1,760.18

OPERATIONAL FACT SHEET

Average Monthly Flowrate (MMSCFD)	
Location	Monthly Average
Etoki	70.82
Tema WAGPCo	113.72
Aboadze WAGPCo	2.09
Aboadze GNGC	124.59
Reverse Flow	49.39

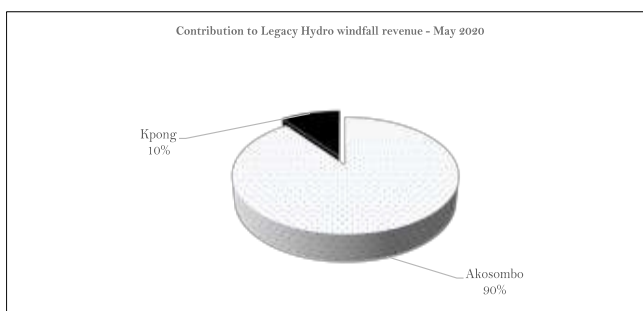
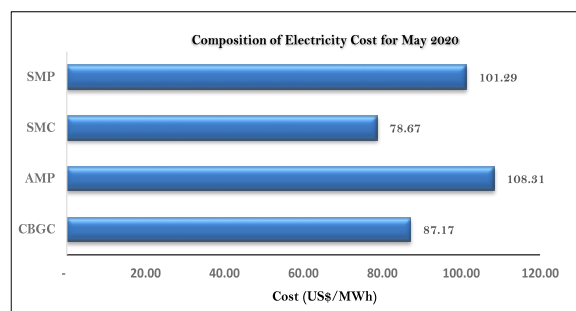
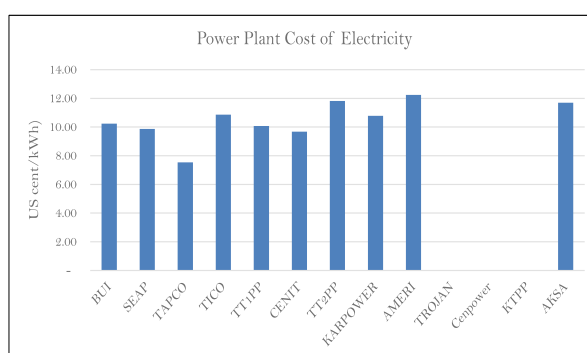
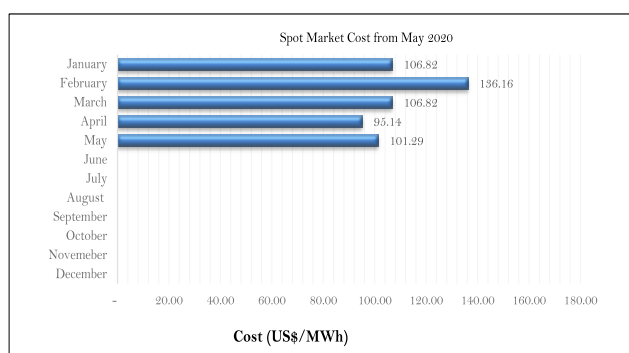
May-20			
	Beginning month (ft)	End month (ft)	Change in water level (feet)
Hydro Dam			
Akosombo	258.50	257.41	-1.09
Bui	569.55	564.01	-5.54



Power Plant Data May 2020							
	Installed Capacity (MW)	Plant Capacity Utilization (%)	Electricity Generation (GWh)	Natural Gas Consumption (MMBtu)	LCO Consumption (MMBtu)	DFO Consumption (MMBtu)	HFO Consumption (MMBtu)
Akosombo	1,020.00	57.04	432.88	-	-	-	-
Kpong	160.00	65.84	78.38	-	-	-	-
Bui	400.00	35.90	106.83	-	-	-	-
SEAP	560.00	62.93	262.18	2,025,074.25	-	-	-
TAPCO	330.00	44.36	108.90	903,986.39	-	-	-
TICO	340.00	59.82	151.32	1,787,830.85	-	-	-
TT1PP	126.00	55.75	52.27	642,699.75	-	-	-
CENIT	126.00	82.61	77.44	833,016.69	-	-	-
TT2PP	87.00	13.86	8.97	115,787.24	-	-	-
KARPOWER	470.00	71.95	251.60	2,011,564.74	-	-	-
AMERI	250.00	63.34	117.82	1,207,897.10	-	-	-
Cenpower	370.00	0.26	0.72	-	-	-	-
TROJAN	56.00	-	-	-	-	-	-
KTPP	220.00	8.95	14.64	88,747.66	-	80,025.79	-
AKSA	360.00	8.40	22.49	-	-	-	183,616.91
Amandi	192.00	22.71	32.44	257,679.68	-	-	-
Bridge Power	-	-	-	-	-	-	-
GENSER	95.00	54.60	38.59	439,484.60	-	-	-
VRA Solar	2.50	12.85	0.24	-	-	-	-
BXC	20.00	18.37	2.73	-	-	-	-
Meinergy	20.00	15.08	2.24	-	-	-	-
Total	5,204.50	45.52	1,762.68	10,313,768.95	-	80,025.79	183,616.91

ECONOMIC FACT SHEET

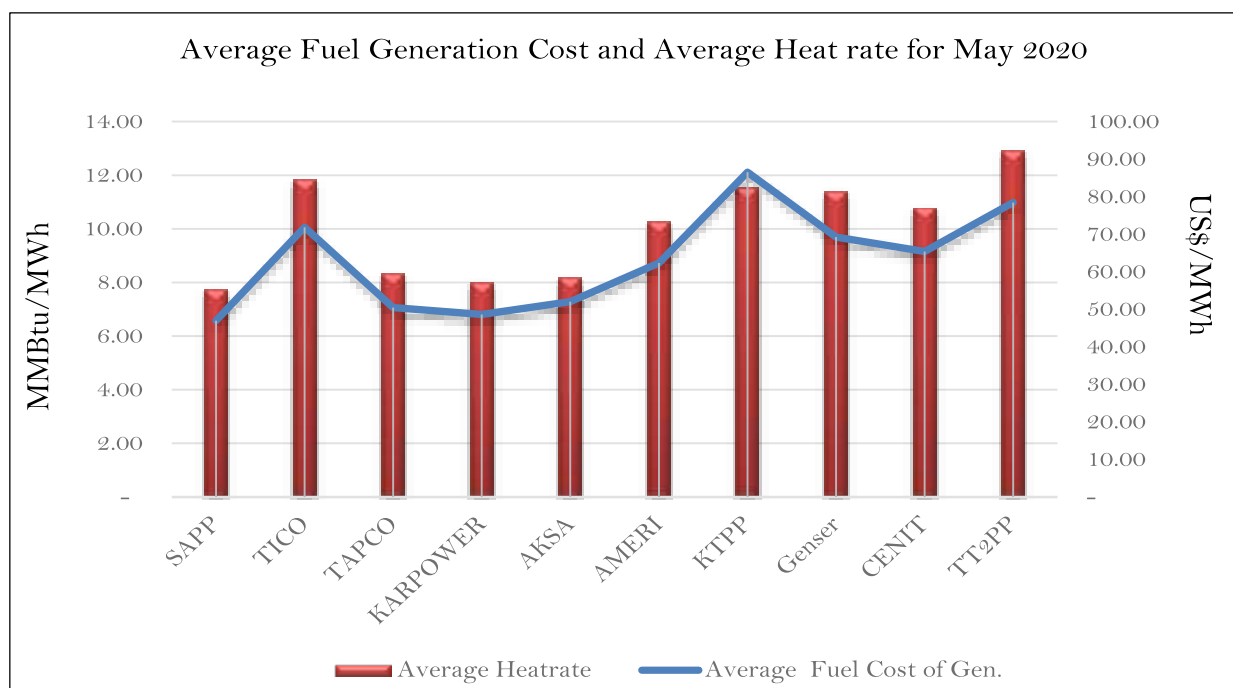
		Actual	Projected	Difference
Average Market Energy Cost	US\$/MWh	69.57	61.68	7.89
Average Market Capacity Charge (AMCC)	US\$/MWh	38.74	41.59	(2.84)
Total Average Market Cost (TAC)	US\$/MWh	108.31	103.27	5.05
System Marginal Cost (SMC)	US\$/MWh	78.67	67.33	11.33
System Marginal Capacity Charge (SMCC)	US\$/MWh	22.62	23.95	(1.33)
Spot Market Price (SMP)	US\$/MWh	101.29	91.28	10.01
Composite Bulk Generation Charge (CBGC)	US\$/MWh	87.17	87.17	-
Deviation of TAC from CBGC	US\$/MWh	(21.14)	(16.10)	(5.05)
Deviation of SMP from CBGC	US\$/MWh	(14.12)	(4.11)	(10.01)



	Gazetted Natural Gas Price	Weighted average Natural Gas Price	LCO	HFO	DFO	LPG
US\$/MMBTu	6.08	6.20	6.50	6.37	9.09	10.21

Average Fuel Prices		
May-20		
Fuel Type	Unit	Delivered Cost
Natural Gas	US\$/MMBTu	6.08
LCO	US\$/BBL	34.38
HFO	US\$/Tonne	186.12
DFO	US\$/Tonne	367.05
LPG	US\$/Tonne	435.60

ECONOMIC FACT SHEET



Power Plant	Capacity Utilization (%)	Average Heat rate (Btu/KWh)	Average Fuel Cost of Generation (US\$/MWh)	Emission Factor (kgCO ₂ /kWh)
Akosombo	57.04	-	-	-
Kpong	65.84	-	-	-
Bui	35.90	-	-	-
SAPP	62.93	7,723.97	46.96	0.41
TAPCO	44.36	8,300.99	50.47	0.44
TICO	59.82	11,814.90	71.83	0.63
TT1PP	55.75	12,296.94	74.77	0.65
CENIT	82.61	10,757.07	65.40	0.57
TT2PP	13.86	12,905.83	78.47	0.68
Amandi	71.95	7,944.18	48.30	0.42
KARPOWER	71.95	7,995.01	48.61	-
AMERI	63.34	10,251.97	62.33	0.54
TROJAN	-	-	-	-
KTPP	8.95	11,525.56	86.51	0.72
AKSA	8.40	8,164.23	52.01	0.64
Cenpower	0.26	-	-	-
Genser	54.60	11,388.56	69.24	0.60

TRANSACTIONS IN THE GHANA WHOLESALE ELECTRICITY MARKET IN MAY 2020

2.1. ELECTRICITY DEMAND

2.1.1. System Demand Overview

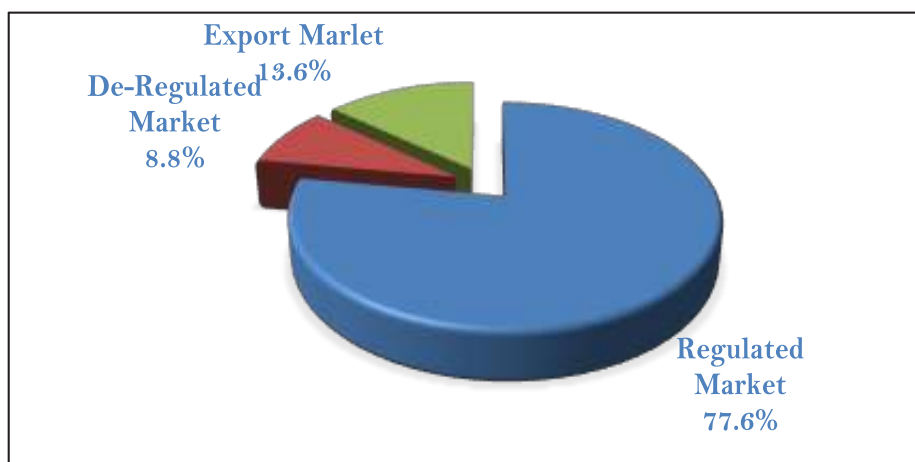
The System Peak Load of 2,950.23 MW recorded in May 2020 comprised domestic and export loads. The System Peak Load recorded in May 2020 was 3.4% lower than the 3,054 MW projected in the 2020 Electricity Supply Plan (ESP). The average electricity demand recorded for May 2020 was 2,377.33 MW.

In meeting the System Peak Load in May 2020, the total electricity supplied by the hydroelectric power plants constituted 1,111.5 MW, representing 37.7% of the total load with electricity generation from thermal sources accounting for the remaining 62.3%.

The Ghana Peak Load recorded for May 2020 was 2,626.3 MW which was 3.6% lower than the 2,724 MW projected in the 2020 ESP.

In May 2020, a total of 1,625.63 GWh of electricity was consumed in the GWEM, which was 1% marginally lower than the 1,610.61 GWh projected in the 2019 ESP. Out of the total electricity consumption for May 2020, the Regulated Market account for 77.6%, the De-Regulated Market accounted for 8.8% and the Export Market accounting for the remaining 13.6%. Figure 2.1 shows the shares of electricity according to the type of market.

Figure 2.1: Shares of the electricity consumed in the various market in May 2020

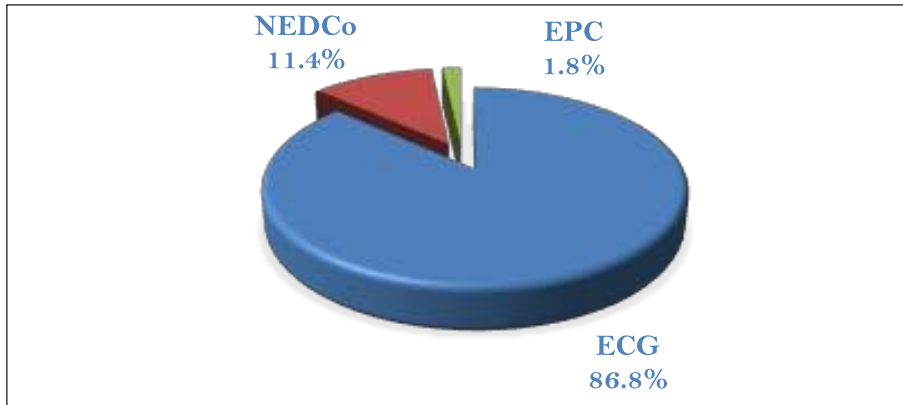


2.2.2 Regulated Market Demand

The Distribution Companies namely, Electricity Company of Ghana (ECG), Northern Electricity Distribution Company (NEDCo) and Enclave Power Company (EPC) are the primary players in the Regulated Market. The collective average electricity demand for the Regulated Market was 1,695.8 MW in May 2020, which was 4.5% higher than the 1,622.28 MW projected in the 2020 ESP.

A total of 1,261.67 GWh of electricity was consumed in the Regulated Market in May 2019. The total electricity consumed in the Regulated Market was 4.5% higher than the 1,206.98 GWh projected in the 2020 ESP and constituted 77.6% of the total electricity consumed in May 2020. The ECG consumed a total of 1,095.36 GWh in May 2020, which constituted 87% of the total electricity consumed in the Regulated Market and was 4% higher than the 1,050.29 GWh projected in the 2020 ESP. A total of 144.13 GWh was consumed by NEDCo in May 2020, which was 10% higher than the 131.35 GWh projected in the 2020 ESP. The total electricity consumed by NEDCo constituted 11% of the total electricity consumed in the Regulated Market. The remaining 2% of the energy consumed in the Regulated Market was accounted for by EPC, which translates into 22.19 GWh. The total electricity consumed by EPC in May 2020 was 12% lower than the 25.34 GWh projected in the 2020 ESP. Figure 2.2 shows the shares of electricity consumed by the Distribution Companies in the in May 2020.

Figure 2: Shares of the electricity consumed by the Distribution Companies in May 2020.



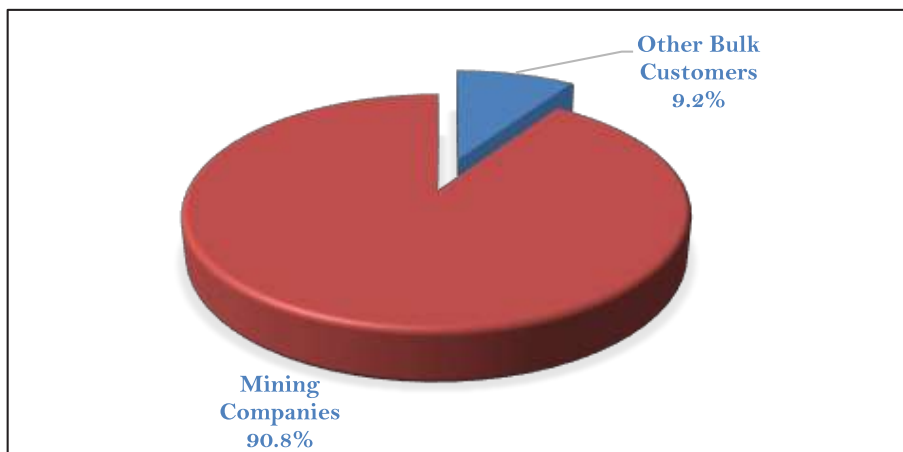
2.2.3 De-regulated Market Demand

The De-Regulated Market in Ghana is made up of Bulk Customers whose consumption is above a threshold determined by the EC and also purchase electricity directly from wholesale suppliers for their own consumption and are granted permits by the Energy Commission to do so. The Bulk Customers operating in the De-Regulated Market include mining companies and large industrial customers. It is important to note that some Bulk Customers within the distribution networks purchase their needs from the Distribution Companies. Currently, of the fifty-one (51) registered Bulk Customers, twenty-three (23) of them operate in the De-Regulated Market. The average electricity demand for the Bulk Customers was 191.3 MW in May 2020, which was 8.1% lower than the projected 208.12 MW in the 2020 ESP. The total electricity demand of the mining companies constituted 91% of the total demand of the Bulk Customers, with Other Bulk Customers accounting for the remaining 9%.

A total of 142.32 GWh was consumed by Bulk Customers in May 2020. The total electricity consumed by the Bulk Customers was 8.1% lower than the 154.84 GWh projected in the 2020 ESP. The total electricity consumed by the Bulk Customers constituted 8.8% of the total electricity consumed in May 2020.

The total electricity consumption of the mining companies in May 2020 was 129.19 GWh, which was 4% lower than the 135.26 GWh projected in the 2020 ESP. The total electricity consumed by the mining companies constituted 91% of the total electricity consumed by Bulk Customers. The Other Bulk Customers consumed a total of 13.13 GWh in May 2020, which was 33% lower than the 19.58 GWh projected in the 2020 ESP. The total electricity consumed by the Other Bulk Customers constituted 9% of the total electricity consumed by Bulk Customers. Figure 2.3 shows the shares of electricity consumed by customer category in the De-Regulated Market in May 2020.

Figure 2.3: Shares of the electricity consumed by customer category in the De-Regulated Market



2.2.4 Export Market Demand

Ghana exports electricity on contractual arrangements to its neighbouring countries: Togo and Benin through Communauté Electrique du Bénin (CEB) and Burkina Faso through La Société Nationale d'Electricité du Burkina (SONABEL). In addition, there is a power exchange arrangement with Compagnie Ivoirienne d'Electricité (CIE) of La Côte d'Ivoire. Electricity supply to the VALCO aluminum smelter plant, located in Tema, is also considered as part of the export market.

An average electricity demand of 297.9 MW was demanded by the export market in May 2020. The average electricity demanded by the export market was 10.9% lower than the projected 334.4 MW in the 2020 ESP. The average electricity demand for the neighboring countries was 216.83 MW in May 2020, which was 17.6% higher than the 184.4 MW projected in the 2020 ESP. VALCO's demand in May 2020 was on average 81.08 MW, which was 45.9% lower than the 150 MW projected in the 2020 ESP.

Other Market News and Trends

A total of 221.64 GWh was consumed in the export market in May 2020. The total electricity consumed in the export market constituted 13.6% of the total electricity consumed in May 2020 and was 10.9% lower than the 248.78 GWh projected in the 2020 ESP. VALCO's consumption of May 2020 was 60.32 GWh, which was 45.9% lower than the 111.6 GWh projected in the 2020 ESP.

2.3 ELECTRICITY SUPPLY

Electricity supplies in the GWEM are traded via the Bilateral Contract Market (BCM) and the Spot Market. The total electricity traded in the BCM was 1,207.62 GWh representing 70.3% of the total electricity traded in May 2020, which was 2.3% lower than the 1,236 GWh projected in the 2020 ESP. On the other hand, 511.25 GWh of electricity, constituting 29.7% of the total electricity traded in May 2020, was supplied in the Spot Market which was 15.4% higher than projected 443 GWh in the 2020 ESP.

2.3.1 Electricity Supply to the Regulated Market

The electricity needs of the Regulated Market were met from both the Bilateral Contract Market and the Spot Market in 2019.

Out of the total electricity of 1,327.57 GWh traded in the Regulated Market, 1,001.99 GWh was purchased through the BCM. The total electricity served to the Regulated Market through the BCM constituted 75.5% of its total electricity traded in May 2020. The remaining 325.58 GWh supplied to the Regulated Market was purchased from the Spot Market, constituting 24.5% of the total electricity traded in May 2020.

The ECG purchased a total of 883.67 GWh of electricity from the BCM which represented 76.7% of the total electricity traded in May 2020. A total of 268.9 GWh of electricity was purchased by the ECG through the Spot Market which constituted 23.3% of the total electricity traded by the ECG in May 2020.

A total of 151.66 GWh was traded by NEDCo in the GWEM in May 2020. The total electricity purchased by NEDCo in the BCM amounted to 100.42 GWh, representing 66.2% of the total electricity traded in May 2020. The remainder of the total electricity supplied to NEDCo in May 2020 was augmented with 51.24 GWh of electricity from the Spot Market.

Out of the total electricity of 23.35 GWh traded by the EPC in the GWEM, a total of 17.9 GWh was supplied from the BCM and 5.45 GWh from the Spot Market.

2.3.2 Electricity Supply to the De-regulated Market

The total electricity traded by the Bulk Customers in May 2020 was 149.76 GWh. Of this total, 107.87 GWh was purchased through the BCM, which represented 72% of the total electricity traded by the Bulk Customers in May 2020. A total of 41.89 GWh was purchased through the Spot Market to augment the electricity purchased through the BCM in May 2020.

2.3.3 Electricity Supply to the Export Market

The total electricity traded by the Export Market amounted to 233.22 GWh in May 2020. Of this total, 92.24 GWh was purchased through the BCM and 140.98 GWh was through the Spot Market. VALCO's total need of 60.23 GWh for May 2020 was supplied only through the Spot Market in line with GoG's directive regarding electricity supply to the smelter.

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
TT2PP = Tema Thermal 2 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

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