



GHANA WHOLESALE ELECTRICITY MARKET BULLETIN

MARKET WATCH

Monthly Market Data Analysis

ISSUE NO. 51

1st March 2020 to 31st March 2020

This Bulletin covers major developments in the Wholesale Electricity Market (WEM) of Ghana from 1st March 2020 to 31st March 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 financial sustainability of the GWEM from October 2019 to March 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

The System Peak Load in March 2020 increased by 2.2%, from 2,892.9 MW in February 2020 to 2,956.1 MW. However, the System Peak Load recorded in March 2020 was 3.5% lower than the 3,064 MW projected in the 2020 Electricity Supply Plan (ESP). The Ghana Peak Load increased by 1.9%, from 2,639.9 MW in February 2020 to 2,691.1 MW in January 2020. On the contrary, the Ghana Peak Load recorded in March 2020 was 2.8% lower than the 2,734 MW projected in the 2020 ESP. A total of 310 MW was exported to CEB, CIE, and SONABEL at the System Peak Load in March 2020 which was 6.1% lower than the 330 MW projected in the 2020 ESP. In March 2020, no electricity was imported from CIE at the System Peak Load. The average electricity demand of 2,401.64 MW recorded in March 2020 was 20.1% higher than the 1,999.87 MW projected in the 2020 ESP.

The average electricity supplied in March 2020 increased by 0.4%, from 57.41 GWh per day in February 2020 to 57.64 GWh per day. Also, the total electricity supply of 1,786.82 GWh supplied in March 2020 was 20.1% higher than the 1,487.9 MW projected in the 2020 ESP. Also, the total electricity of 166.91 GWh exported to CIE, CEB, and SONABEL was 4.3% higher than the 160 GWh projected in the 2020 ESP.

The share of electricity generated from the hydropower plants decreased from 46.9% in February 2020 to 41.2% in March 2020. On the contrary, the share of electricity generated from thermal power plants increased from 53.8% in February 2020 to 58.3% in March 2020. The share of renewable energy in the total electricity supplied continued to be 0.3%

Table 1. Projected and Actual Outturn of electricity demand and supply in March 2020 and February 2020.

	March 2020		February 2020	
	Projected	Actual Outturn	Projected	Actual Outturn
Total Supply (GWh)	1,525.3	1,786.8	1,690.2	1,664.9
Source by Power Plants (GWh)				
AKOSOMBO	593.0	532.9	431.0	568.9
KPONG	80.0	78.1	72.0	72.6
BUI	110.0	125.0	120.0	122.6
Sunon Asogli	239.0	179.9	92.0	-
TAPCO	84.0	109.5	79.0	103.4
TICO	156.0	123.3	176.0	90.6
TT1PP	-	6.4	32.0	-
CENIT	77.0	24.4	-	-
TT2PP	-	4.8	-	-
Amandi	86.0	8.3	-	2.3
Karpowership	85.0	277.6	266.0	299.7
AMERI	139.0	127.2	130.0	126.7
KTPP	38.0	28.7	-	21.7
Trojan Power	-	-	-	-
CENPOWER	34.0	66.0	224.0	121.6
AKSA	-	47.8	64.0	90.2
Bridge Power	-	-	-	-
BXC Solar	2.0	2.7	2.0	2.0
Safisana	-	-	-	-
VRA Solar	0.3	0.3	0.2	0.3
Genser	-	37.1	-	35.5
Meinergy	2.0	2.3	2.0	1.7
Total Generation (GWh)	1,525.3	1,782.3	1,690.2	1,659.7
Imports (GWh)	-	4.5	-	5.2
Total Supply (GWh)	1,525.3	1,786.8	1,690.2	1,664.9
Deficit/Over supply (GWh)	-	261.5	-	(25.3)
Ghana Coincident Peak Load (MW)	2,734.0	2,691.1	2,657.0	2,639.9
System Coincident Peak Load (MW)	3,064.0	2,956.1	2,987.0	2,892.9

HIGHLIGHTS OF THE MONTH

in March 2020.

The average rate of drop in the water level for Akosombo GS and Bui GS remained approximately the same in March 2020. The average rate of drop in the water level for the Akosombo GS was 0.06 feet per day and 0.21 feet per day for the Bui GS.

The share of the total liquid fuel consumed in the total fuel mix decreased in March 2020, from 23.5% in February 2020 to 15.2%. Consequently, the share of the total natural gas consumed in total fuel mix increased from 76.5% in February 2020 to 84.8% in March 2020.

ELECTRICITY DEMAND AND SUPPLY

Electricity Demand

There was a marginal increase of 2.2% in the System Peak Load for March 2020, from 2,892.9 MW in February 2020 to 2,956.1 MW. There was no electricity import at the System Peak Load in March 2020. A total of 310 MW was exported to CIE, CEB, and SONABEL at the System Peak Load in March 2020. Out of the total electricity exported, 45 MW was supplied to CIE, 136 MW to CEB, and 129 MW to SONABEL in March 2020. The Ghana Peak Load increased by 1.9% in March 2020, from 2,639.9 MW in February 2020 to 2,691.1 MW. The total electricity generated from hydro sources contributed 38.5% of the System Peak Load and the Ghana Peak Load, with thermal generation accounting for the rest in March 2020. There was a marginal increase in the average electricity demand by 0.4%, from 2,392.03 MW in February 2020 to 2,401.64 MW in March 2020.

Electricity supply

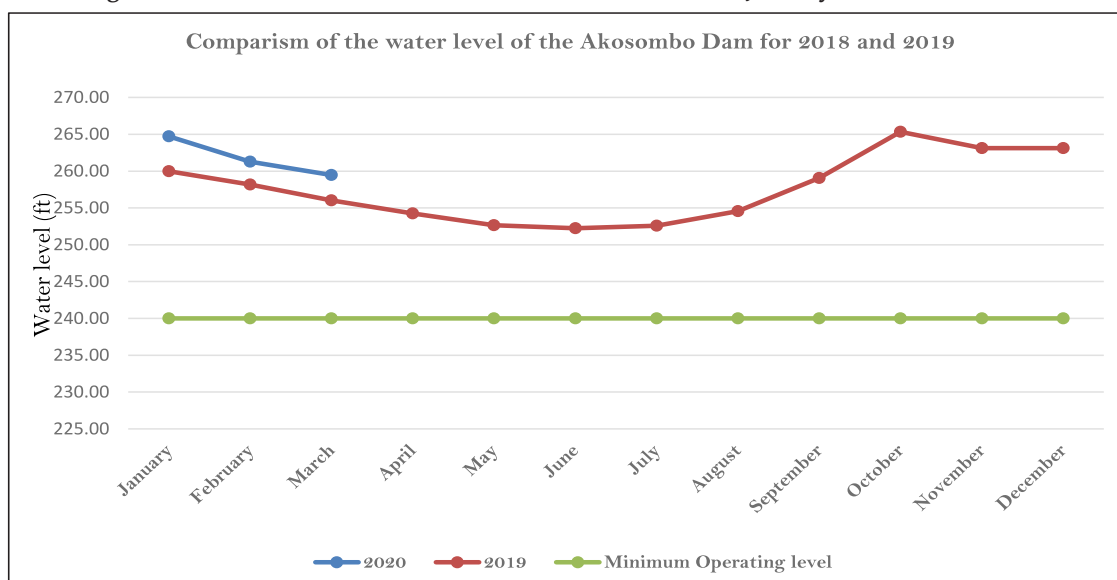
The average electricity supplied in March 2020 increased marginally by 0.4%, from 57.41 GWh per day in February 2020 to 57.64 GWh per day. Similarly, the total electricity of 1,786.82 GWh supplied in March 2020 was 7.3% higher than the 1,664.85 GWh supplied in February 2020. Out of the total electricity supplied in March 2020, 4.54 GWh was imported from CIE whilst the remaining 1,782.28 GWh was supplied from domestic power plants with which embedded generation contributed 2.4%. In March 2020, a total of 166.91 GWh was exported to CIE, CEB, and SONABEL, which was 2.6% lower than the 171.42 GWh supplied in February 2020. Out of the total electricity exported, 12.84 GWh, 72.91 GWh, and 81.16 GWh were supplied to CIE, CEB, and SONABEL respectively in March 2020. The total electricity consumed domestically increased by 8.5%, from 1,493.61 GWh in February 2020 to 1,619.91 GWh in March 2020. The electricity generated from the hydroelectric plants contributed 45.9% of the total electricity supplied in March 2020. This was augmented by a contribution of 54% from thermal generation sources. The total electricity generated from the solar power plants constituted 0.2% of the total electricity supplied in March 2020.

HYDRO DAM LEVELS

Akosombo Dam Water Level continued to drop in March 2020

The rate of drop in the water level for the Akosombo GS reduced from 0.064 feet per day in February 2020 to 0.058 feet per day in March 2020. The water level of 261.27 feet recorded at the beginning of the month dropped by 1.81 feet to a month-end water level of 259.46 feet. The water level recorded at the end of the month was 3.42 feet above the water level recorded for the same period in 2019. Also, the water level recorded at the end of the month was 19.46 feet above the minimum operating water level of the dam.

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



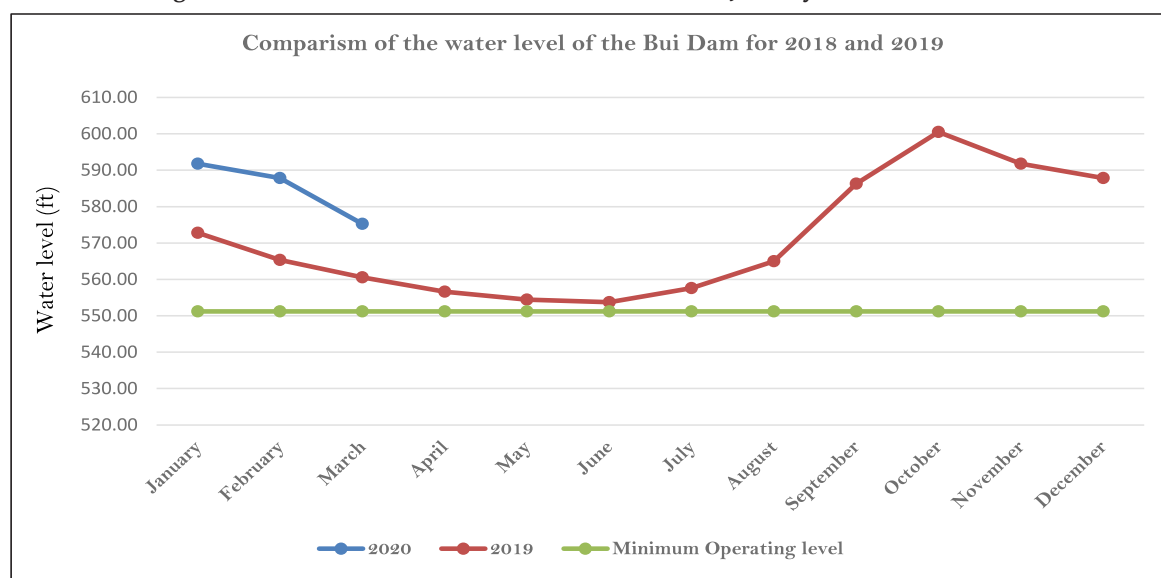
HIGHLIGHTS OF THE MONTH

Bui Dam Water Level continued to drop in March 2019

The rate of drop in the water level for the Bui GS in March 2020 was approximately the same as the 0.21 feet per day recorded in February 2020. The water level of 581.76 feet recorded at the beginning of the month reduced by 6.5 feet to a month-end water level of 575.26 feet. The water level recorded at the end of the month was 14.7 feet above the water level recorded for the same period in 2019. Also, the water level recorded at the end of the month was 24.08 feet above the minimum operating water level.

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

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



FUEL SUPPLY FOR POWER GENERATION

Natural gas import from WAPCo decreased in March 2020

The daily import of natural gas from WAPCo was 48.42 MMSCFD in March 2020, which was 19.3% lower than the 60 MMSCFD recorded in February 2020. Consequently, the total natural gas supplied by WAPCo decreased from 1,740 MMSCF in February 2020 to 1,504.62 MMSCF in March 2020. The total natural gas supplied by WAPCo constituted 20% of the total natural gas consumed in March 2020, which was lower than the 28.8% recorded in February 2020. In the total fuel mix, the share of WAPCo reduced from 22.1% in February 2020 to 17% in March 2020.

Natural gas supply from domestic sources increased in March 2020.

There was no supply of natural gas from GNGC to the Aboadze Power Enclave in March 2020 as WAPCo continued with the pigging exercise which started in January 2020. Nonetheless, GNGC supplied 383.4 MMSCF of natural gas to Genser in March 2020. A total of 3,375.94 MMSCF of natural gas was supplied by GNPC to the Aboadze Power Enclave in March 2020 which was over 100% higher than the 1,552.48 MMSCF supplied in February 2020. Also, GNPC supplied a total of 2,012.9 MMSCF of natural gas to Karpowership and 730.52 MMSCF through the reverse flow facility to Tema and Kpone. In Summary, a total of 6,119.36 MMSCF of natural gas was supplied by GNPC to power plants in March 2020, which was 49.5% higher than the 4,095.95 MMSCF supplied in February 2020. The total natural gas supplied by GNPC constituted 80.3% of the total natural gas consumed in March 2020, which was higher than the 68.1% recorded in February 2020. In the total fuel mix, the share of GNPC increased from 52.1% in February 2020 to 68.1% in March 2020.

Liquid Fuel

The consumption liquid fuel in March 2020 decreased by 22.3%, from 338,632 barrels in February 2020 to 261,089 barrels. The share of HFO consumed in the total liquid fuel mix decreased from 39.1% in February 2020 to 26.6% in March 2020. In the total fuel mix, the share of HFO decreased from 9.1% in February 2020 to 4% in March 2020. The share of the LCO consumed in the total liquid fuel mix increased from 45.5% in February 2020 to 51.5% in March 2020. On the contrary, the share of the LCO consumed in the total fuel mix decreased from 11% in February 2020 to 7.8% in March 2020. DFO consumption contributed 21.9% of the total liquid fuel consumed in March 2020 which was higher than the 13.4% recorded in February 2020. In the total fuel mix, the share of DFO increased from 3.1% in February 2020 to 3.3% in March 2020 due to the operations of KTPP on DFO.

HIGHLIGHTS OF THE MONTH

Plant by Plant Highlights

Electricity Generation at the Akosombo Generation Station (GS) decreased in March 2020

The average electricity supplied by the Akosombo GS decreased by 12.4% in March 2020, from 19.62 GWh per day in February 2020 to 17.19 GWh per day. Similarly, the total electricity supplied by the Akosombo GS decreased by 6.3%, from 568.88 GWh in February 2020 to 532.95 GWh in March 2020. The total electricity generated by the hydropower plant constituted 29.8% of the total electricity supplied in March 2020 and was 35.6% higher than the total electricity projected in the 2020 ESP. The Akosombo GS contributed 786.1 MW to the System Peak Load and the Ghana Peak Load, representing 26.6% of the System Peak Load and 29.2% of the Ghana Peak Load in March 2020.

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

The average electricity generated by the Kpong GS increased marginally by 0.7%, from 2.5 GWh per day in February 2020 to 2.52 GWh per day in March 2020. Similarly, the total electricity generated by the hydropower plant increased by 7.6%, from 72.56 GWh in February 2020 to 78.07 GWh in March 2020. The total electricity supplied by the hydropower plant in March 2020 was 2.1% lower than the 80 GWh projected in the 2020 ESP and constituted 4.4% of the total electricity supplied. The Kpong GS contributed 112.2 MW to the System Peak Load and the Ghana Peak Load, this represents 3.8% and 4.2% of the respective peak loads in March 2020.

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

The Bui GS recorded a 4% decrease in the average electricity generated in March 2020, from 4.23 GWh per day in February 2020 to 4.03 GWh per day. On the contrary, the total electricity supplied by the Bui GS increased by 2%, from 122.59 GWh in February 2020 to 125 GWh in March 2020. The increase in the total electricity generated in March 2020 was due to a greater number of days in March. The total electricity generated by the hydropower plant was 13.6% higher than the 110 GWh projected in the 2020 ESP and constituted 7.4% of the total electricity supplied in March 2020. The hydropower plant contributed 239.1 MW to the System Peak Load and Ghana Peak Load, representing 8.1% of the respective peak loads in March 2020.

The Sunon Asogli Power Plant (SAPP) resumed operation in March 2020

The Sunon Asogli Power Plant resumed operation on 5th March 2020 and supplied 179.87 GWh. The total electricity supplied by the thermal power plant constituted 10.1% of the total electricity supplied in March 2020 and was 24.7% lower than the 239.34 GWh projected in the 2020 ESP. The thermal power plant consumed a total of 1,395.61 MMSCF of natural gas at an estimated heat rate of 8,282.38 Btu/kWh in March 2020.

Ameri Energy Power Plant's generation increased in March 2020

The Ameri power plant recorded an increase of 6.1% in the average electricity supplied in March 2020, from 4.37 GWh per day in February 2020 to 4.1 GWh per day. Similarly, the total electricity supplied by the Ameri power plant increased marginally by 0.4%, from 126.73 GWh in February 2020 to 127.19 GWh in March 2020. The total electricity supplied by the thermal power plant constituted 7.1% of the total electricity supplied in March 2020 and was 8.5% lower than the 139 GWh projected in the 2020 ESP. The thermal power plant contributed 166.9 MW to the System Peak Load and the Ghana Peak Load. This constituted 5.7% of the System Peak Load and 6.2% of the Ghana Peak Load in March 2020. The Ameri power plant consumed a total of 1,286.92 MMSCF of natural gas at an estimated heat rate of 10,381.6 Btu/kWh in March 2020 which was lower than the 10,606.86 Btu/kWh in February 2020.

The Karpowership Power Plant's generation decreased in March 2020

The average electricity supplied by the Karpowership decreased by 13.4%, from 10.34 GWh per day in February 2020 to 8.96 GWh per day in March 2020. Similarly, the total electricity supplied by the thermal power plant decreased by 299.7 GWh in February 2020 to 277.61 GWh in March 2020. The total electricity supplied by the thermal power plant constituted 15.5% of the total electricity supplied in March 2020 and was over two folds higher than the 85 GWh projected in the 2020 ESP. The Karpowership supplied a total of 390.6 MW to the System Peak Load and the Ghana Peak Load, representing 13.2% and 14.5% of the respective peak loads in March 2020. The thermal power plant consumed a total of 2,012.59 MMSCF of natural gas at an estimated improved heat rate of 7,981.83 Btu/kWh in March 2020 from 8,102.94 Btu/kWh recorded in February 2020.

AKSA Power Plant's generation decreased in March 2020

There was a significant reduction of 50.4% in the average electricity supplied in March 2020 by AKSA, from 3.11 GWh per day in February 2020 to 1.54 GWh per day. Likewise, the total electricity supplied by AKSA decreased by 47%, from 90.23 GWh in February 2020 to 47.84 GWh in March 2020. The total electricity supplied by the thermal power plant contributed 2.7% of the total electricity supplied in March 2020. The thermal power plant was projected to be offline in March 2020. AKSA contributed 202.5 MW to the System Peak Load and the Ghana Peak Load, representing 6.9% and 7.5% of the respective peak loads in March 2020. The thermal power plant consumed a total of 63,705 barrels of HFO at an estimated improved heat rate of 8,055.84 Btu/kWh in March 2020 from the 8,175.12 Btu/kWh recorded in February 2020.

Takoradi International Company (TICO) generation increased in March 2020

There was an increase of 27.4% in the average electricity supplied by TICO, from 3.12 GWh per day in February 2020 to 3.98 GWh per day in March 2020. The total electricity supplied by TICO also increased by 36.2%, from 90.56 GWh in February 2020 to 123.34 GWh in March 2020. The total electricity supplied by the thermal power plant constituted 6.9% of the total electricity supplied in March 2020 and was 20.9% lower than the 156 GWh projected in the 2020 ESP. TICO supplied 208.5 MW to the System Peak Load and the Ghana Peak Load, translating into 7.1% and 7.8% of the respective peak loads in March 2020. A total of 1,181.78 MMSCF of natural gas, 48,050 barrels of LCO, and 54 barrels of DFO were consumed by TICO at an estimated heat rate of 11,894.15 Btu/kWh in March 2020 which was an improvement on the 12,276.09 Btu/kWh recorded in February 2020.

Takoradi Power Company (TAPCO) Plant's generation decreased in March 2020

TAPCO recorded a marginal reduction of 1% in the average electricity supplied in March 2020, from 3.57 GWh per day in February 2020 to 3.53 GWh per day. On the contrary, the total electricity supplied increased by 5.9%, from 103.38 GWh in February 2020 to 109.47 GWh in March 2020. The total electricity supplied by TAPCO constituted 6.1% of the total electricity supplied in March 2020 and was 30.3% more than the 84 GWh projected in the 2020 ESP. The thermal power plant contributed 153.4 MW to the System Peak Load and the Ghana Peak Load. This represents 5.2% of the System Peak Load and 5.7% of the Ghana Peak Load in March 2020. TAPCO

HIGHLIGHTS OF THE MONTH

consumed a total of 907.24 MMSCF of natural gas at an estimated heat rate of 8,503.39 Btu/kWh in March 2020 which was higher than the 8,470.67 Btu/kWh in February 2020.

Kpone Thermal Power Plant (KTPP) generation increased in March 2020

The operation of KTPP was limited to 18 days in March 2020. The thermal power plant supplied a total of 28.74 GWh which was higher than the 21.7 GWh supplied in February 2020. The total electricity supplied by the thermal power plant constituted 1.6% of the total electricity supplied in March 2020. However, KTPP was projected to be offline in the 2020 ESP. KTPP contributed 94 MW to the System Peak Load and the Ghana Peak Load, representing 3.2% and 3.5% of the respective peak loads in March 2020. A total of 58,694.49 barrels of DFO was consumed by the thermal power plant at an estimated heat rate of 10,966.47 Btu/kWh in March 2020 which was lower than the 11,281.51 Btu/kWh recorded in February 2020.

Tema Thermal 1 Power Plant's (TT1PP) operated in March 2020

TT1PP came back online and operated for 6 days in March 2020. The thermal power plant supplied a total of 6.42 GWh, which constituted 0.4% of the total electricity supplied in March 2020. However, the thermal power plant was scheduled to be offline in the 2020 ESP. A total of 67.66 MMSCF of natural gas was consumed by TT1PP at an estimated heat rate of 11,250.48 Btu/kWh in March 2020. The thermal power did not contribute to both the System Peak Load and the Ghana Peak Load in March 2020.

CENIT Power Plant's came back online in March 2020

The Cenit power plant came back online and operated for 12 days and supplied a total of 24.42 GWh in March 2020. The total electricity supplied by the thermal power plant constituted 1.4% of the total electricity supplied in March 2020. The thermal power plant was projected to supply 77 GWh in the 2020 ESP but supplied 68.3% less. CENIT contributed 109 MW to the System Peak Load and the Ghana Peak Load, representing 3.7% and 4.1% of the respective peak loads in March 2020. The thermal power plant consumed a total of 246.25 MMSCF of natural gas at an estimated heat rate of 11,104 Btu/kWh in March 2020.

Cenpower generation decreased in March 2020

The operation of the Cenpower plant was limited to 19 days in March 2020. The thermal power plant supplied a total of 66 GWh which constituted 3.7% of the total electricity supplied in March 2020 and was 45.7% lower than the 121.6 GWh supplied in February 2020. Cenpower contributed 120.5 MW to the System Peak Load and the Ghana Peak Load, representing 4.1% and 4.5% of the respective peak loads in March 2020. The thermal power plant consumed a total of 31.48 MMSCF of natural gas and 90,279 barrels of LCO at an estimated heat rate of 8,001.68 Btu/kWh in March 2020 which was higher than the 7,561.4 Btu/kWh in February 2020.

Embedded Electricity Generation

Genser Power Plant's generation decreased in March 2020

The Genser power plant recorded a marginal reduction of 2.2% in the average electricity supplied in March 2020, from 1.22 GWh per day in February 2020 to 1.2 GWh per day. On the contrary, the total electricity supplied by the thermal power plant increased by 4.6%, from 35.49 GWh in February 2020 to 37.12 GWh in March 2020. The total electricity supplied by Genser in March 2020 constituted 2.1% of the total electricity supplied. A total of 383.4 MMSCF of natural gas was consumed by the Genser thermal power plant at an estimated heat rate of 11,371.95 Btu/kWh in March 2020 which was higher than the 11,313.84 Btu/kWh in February 2020.

BXC Solar Power Plant's generation increased in March 2020

The average electricity supplied by the BXC solar power plant increased in March 2020 by 22.8%, from 0.07 GWh per day in February 2020 to 0.086 GWh per day. The total electricity generated by the BXC solar increased by 31.2% in March 2020, from 2.04 GWh in February 2020 to 2.68 GWh. The total electricity supplied by the solar power plant constituted 0.1% of the total electricity supplied in March 2020 and was 16.6% higher than the 2.3 GWh projected in the 2020 ESP.

Meinergy Solar Power Plant's generation increased in March 2020

The average electricity supplied by the Meinergy solar power plant increased by 27.8%, from 0.06 GWh per day in February 2020 to 0.07 GWh per day in March 2020. Similarly, the total electricity supplied by the solar power plant increased by 36.6%, from 1.66 GWh in February 2020 to 2.27 GWh in March 2020. The total electricity supplied by the solar power plant was 1.2% less than the 2.3 GWh projected in the 2020 ESP and constituted 0.1% of the total electricity generated in March 2020.

VRA Navrongo Solar Power Plant's generation increased in March 2020

The total electricity supplied by the VRA solar power plant increased by 4.6% in March 2020, from 0.28 GWh in February 2020 to 0.3 GWh. The total electricity supplied by the solar power plant constituted 0.02% of the total electricity supplied in March 2020 and was the same as the projected supply in the ESP for 2020.

Electricity Exchange – Import decreased whilst Export increased in November 2019

There was a reduction of 17.8% of the average electricity import from CIE in March 2020. The average electricity import decreased from 0.18 GWh per day in February 2020 to 0.15 GWh per day in March 2020. Similarly, the total electricity imported decreased by 12.2%, from 5.17 GWh in February 2020 to 4.54 GWh in March 2020. The total electricity imported constituted 0.3% of the total electricity supplied in March 2020.

The average electricity exported to CIE, CEB and SONABEL decreased by 8.9%, from 5.91 GWh per day in February 2020 to 5.38 GWh per day in March 2020. The average electricity exported to CEB decreased by 23.5%, from 3.07 GWh per day in February 2020 to 2.35 GWh per day in March 2020. On the contrary, the average electricity exported to CIE and SONABEL increased by 14.1% and 5.8%, from 0.36 GWh per day and 2.48 GWh per day in February 2020 to 0.41 GWh per day and 2.62 GWh per day in March 2020 respectively.

Similarly, the total electricity exported decreased by 2.6%, from 171.42 GWh in February 2020 to 166.91 GWh in March 2020. The total electricity exported to CEB decreased by 18.2%, from 89.12 GWh in February 2020 to 72.91 GWh in March 2020. The total electricity exported to CIE and SONABEL increased from 10.53 GWh and 71.77 GWh in February 2020 to 12.84 GWh and 81.16 GWh in March 2020.

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

OPERATIONAL FACT SHEET

Monthly Market Data Analysis

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

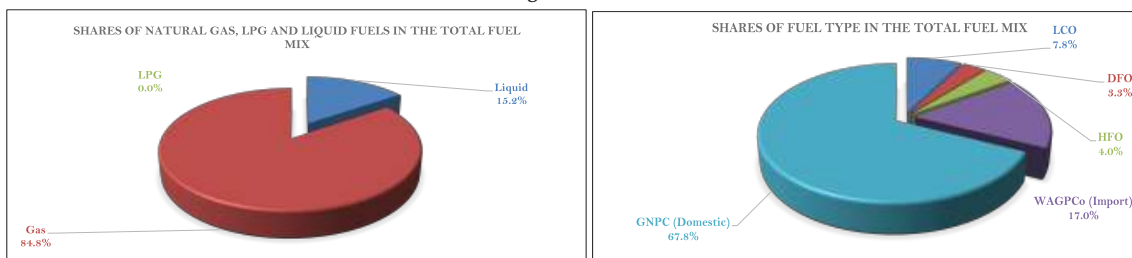


Figure 4a: Contribution of Natural Gas Supply by sources

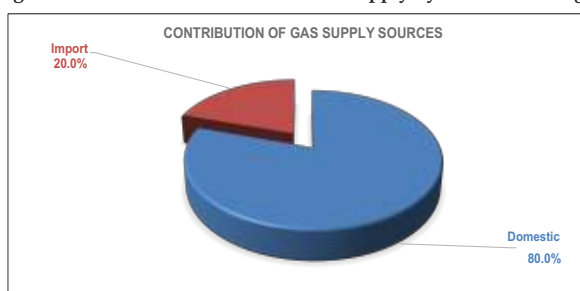
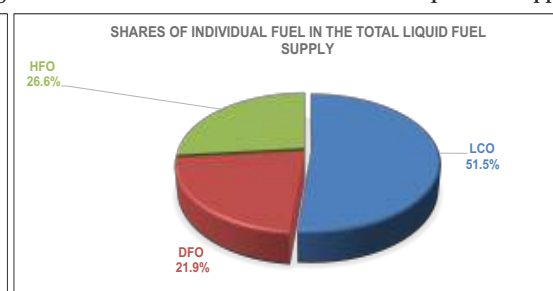


Figure 4b: Contribution of individual fuel in the liquid fuel supply

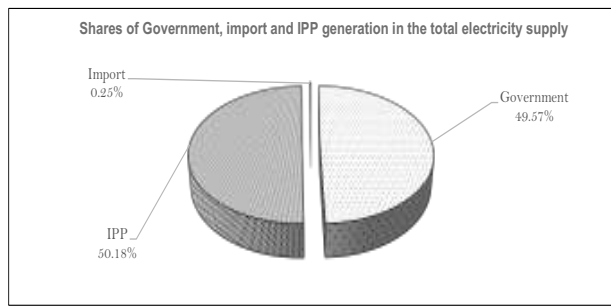
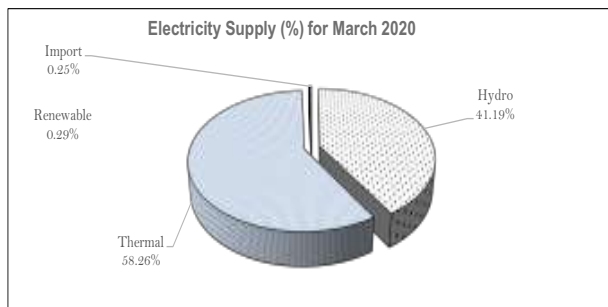


Peak Electricity Supply - March 2020			
Source of Supply	Generation at System Peak Load (MW)	Generation at Ghana Peak Load (MW)	Electricity Supply (GWh)
AKOSOMBO	786.10	786.10	532.95
KPONG	112.20	112.20	78.07
BUI	239.10	239.10	125.00
SEAP	366.10	366.10	179.87
TAPCO	153.40	153.40	109.47
TICO	208.50	208.50	123.34
TT1PP	-	-	6.42
CENIT	109.00	109.00	24.42
TT2PP	7.20	7.20	4.75
MRP	-	-	8.25
KARPOWER	390.60	390.60	277.61
AMERI	166.90	166.90	127.19
KTPP	94.00	94.00	28.74
Trojan Power	-	-	-
CENPOWER	120.50	120.50	66.00
AKSA	202.50	202.50	47.84
BXC Solar	-	-	2.68
Safisana	-	-	-
VRA Solar	-	-	0.30
Genser	-	-	37.12
IMPORT	2,956.10	2,956.10	4.54
Export to CIE at peak	-	-	72.91
Export to CEB at peak	136.00	136.00	12.84
Export to Sonabel	129.00	129.00	81.16
System Coincident Peak Load	2,956.10		
Ghana Coincident Peak Load		2,691.10	
Total Supply			1,784.55
Total Supply without export			1,617.63

OPERATIONAL FACT SHEET

Average Monthly Flowrate (MMSCFD)	
Location	Monthly Average
Etoki	69.67
Tema WAGPCo	56.05
Aboadze WAGPCo	6.70
Aboadze GNGC	103.22
Reverse Flow	15.26

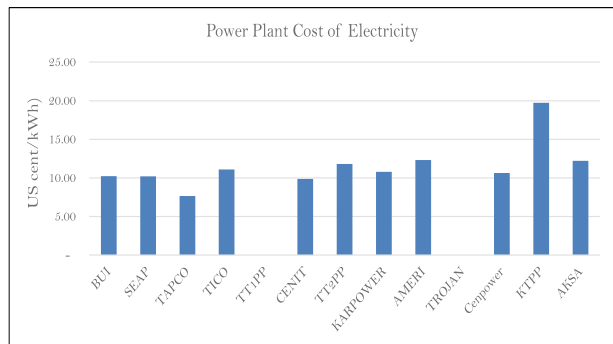
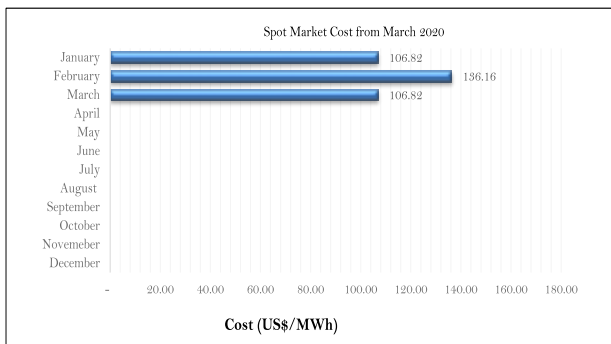
Mar-20			
	Beginning month (ft)	End month (ft)	Change in water level (feet)
Hydro Dam			
Akosombo	261.27	259.46	-1.81
Bui	581.76	575.26	-6.50



Power Plant Data March 2020								
	Installed Capacity (MW)	Plant Capacity Utilization (%)	Electricity Generation (GWh)	Natural Gas Consumption (MMBtu)	LCO Consumption (MMBtu)	DFO Consumption (MMBtu)	HFO Consumption (MMBtu)	LPG Consumption (MMBtu)
Akosombo	1,020.00	70.23	532.95	-	-	-	-	-
Kpong	160.00	65.58	78.07	-	-	-	-	-
Bui	400.00	42.00	125.00	-	-	-	-	-
SEAP	560.00	43.17	179.87	1,489,754.88	-	-	-	-
TAPCO	330.00	44.59	109.47	930,831.77	-	-	-	-
TICO	340.00	48.76	123.34	1,212,503.51	254,231.09	289.33	-	-
TT1PP	126.00	6.85	6.42	72,228.11	-	-	-	-
CENIT	126.00	26.05	24.42	271,122.93	-	-	-	-
TT2PP	87.00	7.34	4.75	61,319.47	-	-	-	-
KARPOWER	470.00	79.39	277.61	2,215,862.65	-	-	-	-
AMERI	250.00	68.38	127.19	1,320,383.18	-	-	-	-
Cenpower	370.00	23.97	66.00	33,603.61	492,832.62	1,647.17	-	-
TROJAN	56.00	-	-	-	-	-	-	-
KTPP	220.00	17.56	28.74	-	-	315,189.39	-	-
AKSA	360.00	17.86	47.84	-	-	-	385,415.47	-
Amandi	-	-	8.25	57,207.06	-	-	-	-
Bridge Power	-	-	-	-	-	-	-	-
GENSER	95.00	52.52	37.12	422,126.96	-	-	-	-
VRA Solar	2.50	15.91	0.30	-	-	-	-	-
BXC	20.00	18.03	2.68	-	-	-	-	-
Meinergy	20.00	15.28	2.27	-	-	-	-	-
Total	5,012.50	47.79	1,782.28	8,086,944.12	747,063.71	317,125.89	385,415.47	-

ECONOMIC FACT SHEET

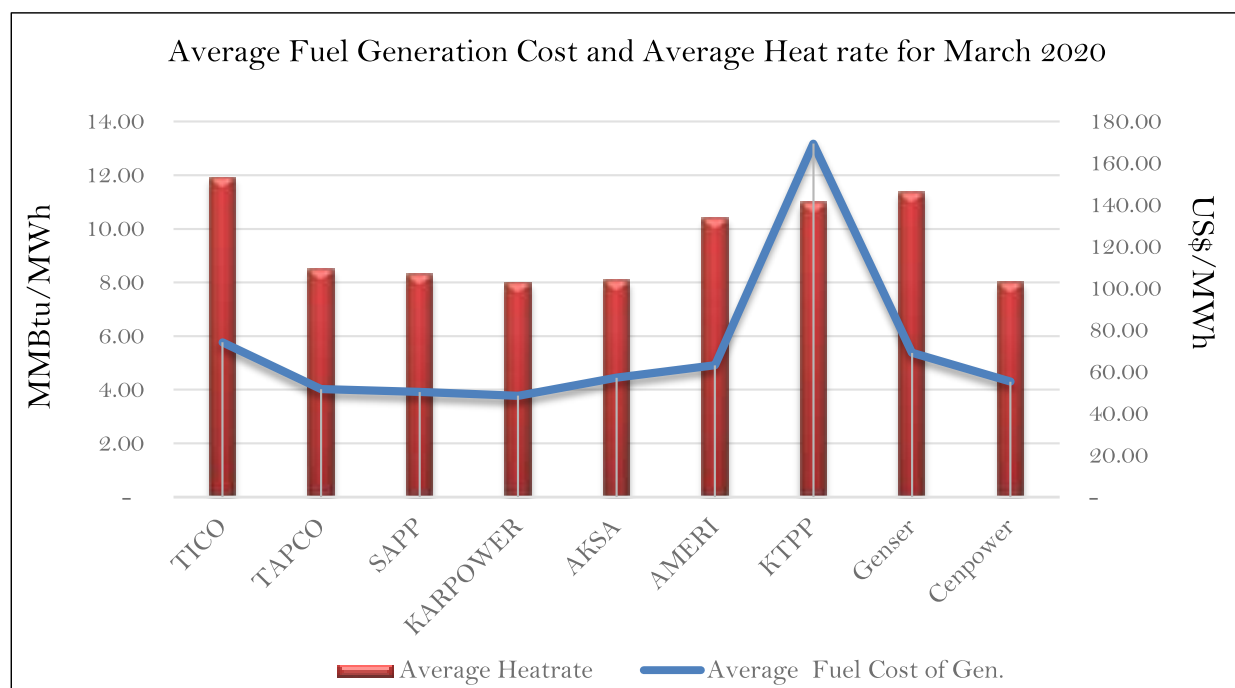
		Actual	Projected	Difference
Average Market Energy Cost	US\$/MWh	69.23	65.10	4.13
Average Market Capacity Charge (AMCC)	US\$/MWh	40.06	38.74	1.32
Total Average Market Cost (TAC)	US\$/MWh	109.30	103.84	5.45
System Marginal Cost (SMC)	US\$/MWh	82.87	72.30	10.56
System Marginal Capacity Charge (SMCC)	US\$/MWh	23.95	23.95	-
Spot Market Price (SMP)	US\$/MWh	106.82	96.25	10.56
Composite Bulk Generation Charge (CBGC)	US\$/MWh	87.17	87.17	-
Deviation of TAC from CBGC	US\$/MWh	(22.13)	(16.67)	(5.45)
Deviation of SMP from CBGC	US\$/MWh	(19.65)	(9.08)	(10.56)



	Gazetted Natural Gas Price	Weighted average Natural Gas Price	LCO	HFO	DFO	LPG
US\$/MMBTu	6.08	7.06	6.99	7.10	15.45	15.59

Average Fuel Prices		
		Mar-20
Fuel Type	Unit	Delivered Cost
Natural Gas	US\$/MMBTu	6.08
LCO	US\$/BBL	37.01
HFO	US\$/Tonne	213.70
DFO	US\$/Tonne	624.00
LPG	US\$/Tonne	665.02

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	70.23	-	-	-
Kpong	65.58	-	-	-
Bui	42.00	-	-	-
SAPP	43.17	8,282.38	50.36	0.44
TAPCO	44.59	8,503.39	51.70	0.45
TICO	48.76	11,894.15	74.19	0.68
TT ₁ PP	6.85	11,250.48	68.40	0.60
CENIT	26.05	11,104.00	67.51	0.59
TT ₂ PP	7.34	12,905.83	78.47	0.68
KARPOWER	79.39	7,981.83	48.53	-
AMERI	68.38	10,381.60	63.12	0.55
TROJAN	-	-	-	-
KTPP	17.56	10,966.47	169.40	0.58
AKSA	17.86	8,055.84	57.19	0.63
Cenpower	23.97	8,001.68	55.33	0.59
Genser	52.52	11,371.95	69.14	0.60

Other Market News and Trends

	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20
Analysis A						
Cost of Generation (GHp/kWh)	35.92	37.90	45.36	46.08	42.19	45.39
PURC CBGT (GHp/kWh)	46.87	46.87	46.87	46.87	46.87	46.87
Difference (GHp/kWh)	10.95	8.97	1.51	0.79	4.68	1.48
Analysis B						
Cost of Generation (USCent/kWh)	6.75	0.00	0.00	8.34	7.93	8.47
PURC CBGT (USCent/kWh)	8.80	8.70	8.46	8.48	8.81	8.75
Difference (USCent/kWh)	2.06	8.70	8.46	0.14	0.88	0.28
Average Monthly Exchange rate (GHS/US\$)	5.32	5.39	5.54	5.53	5.32	5.36

	October 2019 indicator							
	Ghana	World	SSA	OECD	High Income Non-OECD	Upper Middle Income	Lower Middle Income	Low Income
Ratio Installed capacity to Demand	1.95	2.6	2.2	2.3	2.5	2.4	3.1	2.9
Capacity Factor	0.40	0.5	0.5	0.5	0.5	0.5	0.5	0.4

	November 2019 indicator							
	Ghana	World	SSA	OECD	High Income Non-OECD	Upper Middle Income	Lower Middle Income	Low Income
Ratio Installed capacity to Demand	1.83	2.6	2.2	2.3	2.5	2.4	3.1	2.9
Capacity Factor	0.44	0.5	0.5	0.5	0.5	0.5	0.5	0.4

	December 2019 indicator							
	Ghana	World	SSA	OECD	High Income Non-OECD	Upper Middle Income	Lower Middle Income	Low Income
Ratio Installed capacity to Demand	1.79	2.6	2.2	2.3	2.5	2.4	3.1	2.9
Capacity Factor	0.45	0.5	0.5	0.5	0.5	0.5	0.5	0.4

	January 2020 indicator							
	Ghana	World	SSA	OECD	High Income Non-OECD	Upper Middle Income	Lower Middle Income	Low Income
Ratio Installed capacity to Demand	1.73	2.6	2.2	2.3	2.5	2.4	3.1	2.9
Capacity Factor	0.45	0.5	0.5	0.5	0.5	0.5	0.5	0.4

	February 2020 indicator							
	Ghana	World	SSA	OECD	High Income Non-OECD	Upper Middle Income	Lower Middle Income	Low Income
Ratio Installed capacity to Demand	1.73	2.6	2.2	2.3	2.5	2.4	3.1	2.9
Capacity Factor	0.48	0.5	0.5	0.5	0.5	0.5	0.5	0.4

	March 2020 indicator							
	Ghana	World	SSA	OECD	High Income Non-OECD	Upper Middle Income	Lower Middle Income	Low Income
Ratio Installed capacity to Demand	1.70	2.6	2.2	2.3	2.5	2.4	3.1	2.9
Capacity Factor	0.48	0.5	0.5	0.5	0.5	0.5	0.5	0.4

Other Market News and Trends

	October 2019 indicator							
	Ghana	World	SSA	OECD	Non-OECD	Income	Middle	Income
Capacity annual growth (%)	10.83	3.1	3.1	2.6	3.1	2.7	3.9	3.4
Ratio of installed capacity growth to demand growth	2.83	-3	0.2	-15.1	0.6	0.7	0.3	0.02

	November 2019 indicator							
	Ghana	World	SSA	OECD	High Income Non-OECD	Upper Middle Income	Middle Income	Low Income
Ratio Installed capacity to Demand	9.86	3.1	3.1	2.6	3.1	2.7	3.9	3.4
Ratio of installed capacity growth to demand growth	0.93	-3	0.2	-15.1	0.6	0.7	0.3	0.02

	December 2019 indicator							
	Ghana	World	SSA	OECD	High Income Non-OECD	Upper Middle Income	Middle Income	Low Income
Ratio Installed capacity to Demand	9.86	3.1	3.1	2.6	3.1	2.7	3.9	3.4
Ratio of installed capacity growth to demand growth	0.89	-3.0	0.2	-15.1	0.6	0.7	0.3	0.02

	January 2020 indicator					
	Ghana	SSA	High Income Non-OECD	Upper Middle Income	Lower Middle Income	Low Income
Capacity annual growth (%)	1.42	3.1	3.1	2.7	3.9	3.4
Ratio of installed capacity growth to demand growth	14.81	0.2	0.6	0.7	0.3	0.02

	February 2020 indicator					
	Ghana	SSA	High Income Non-OECD	Upper Middle Income	Lower Middle Income	Low Income
Capacity annual growth (%)	1.16	3.1	3.1	2.7	3.9	3.4
Ratio of installed capacity growth to demand growth	7.49	0.2	0.6	0.7	0.3	0.02

	March 2020 indicator					
	Ghana	SSA	High Income Non-OECD	Upper Middle Income	Lower Middle Income	Low Income
Capacity annual growth (%)	1.16	3.1	3.1	2.7	3.9	3.4
Ratio of installed capacity growth to demand growth	11.54	0.2	0.6	0.7	0.3	0.02

	October 2019 indicator							
	Ghana	World	SSA	High Income Non-OECD	Upper Middle Income	Lower Middle Income	Low Income	
Emission Factor (KgCO ₂ /kWh)	0.30	0.6	0.5	0.9	0.7	0.5	0.3	
Fossil fuel dependency (%)	61.88	60.7	45.3	84.4	66.4	59.4	40.6	

	November 2019 indicator							
	Ghana	World	SSA	High Income Non-OECD	Upper Middle Income	Lower Middle Income	Low Income	
Emission Factor (KgCO ₂ /kWh)	0.27	0.6	0.5	0.9	0.7	0.5	0.3	
Fossil fuel dependency (%)	57.72	60.7	45.3	84.4	66.4	59.4	40.6	

Other Market News and Trends

	December 2019 indicator						
	Ghana	World	SSA	High Income Non-OECD	Upper Middle Income	Lower Middle Income	Low Income
Emission Factor (KgCO ₂ /kWh)	0.32	0.6	0.5	0.9	0.7	0.5	0.3
Fossil fuel dependency (%)	64.55	60.7	45.3	84.4	66.4	59.4	40.6

	January 2020 indicator						
	Ghana	World	SSA	High Income Non-OECD	Upper Middle Income	Lower Middle Income	Low Income
Emission Factor (KgCO ₂ /kWh)	0.31	0.6	0.5	0.9	0.7	0.5	0.3
Fossil fuel dependency (%)	61.35	60.7	45.3	84.4	66.4	59.4	40.6

	February 2020 indicator						
	Ghana	World	SSA	High Income Non-OECD	Upper Middle Income	Lower Middle Income	Low Income
Emission Factor (KgCO ₂ /kWh)	0.28	0.6	0.5	0.9	0.7	0.5	0.3
Fossil fuel dependency (%)	53.56	60.7	45.3	84.4	66.4	59.4	40.6

	March 2020 indicator						
	Ghana	World	SSA	High Income Non-OECD	Upper Middle Income	Lower Middle Income	Low Income
Emission Factor (KgCO ₂ /kWh)	0.30	0.6	0.5	0.9	0.7	0.5	0.3
Fossil fuel dependency (%)	58.26	60.7	45.3	84.4	66.4	59.4	40.6

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 Peseva
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, Enyenra, Ntomme
TT2PP = Tema Thermal 2 Power Plant
WAGPCo = West African Gas Pipeline Company
WEM = Wholesale Electricity Market

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