



GHANA WHOLESALE ELECTRICITY MARKET BULLETIN

MARKET WATCH

Monthly Market Data Analysis

ISSUE NO. 52

1st April 2020 to 30th April 2020

This Bulletin covers major developments in the Wholesale Electricity Market (WEM) of Ghana from 1st April, 2020 to 30th April 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 impact of the COVID - 19 on the Electricity Supply Industry (ESI) in Ghana.

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

Ghana confirmed its first case of COVID - 19 on the 12th March 2020. The Government imposed some restrictions on large gatherings and movement in order to slow down the spread of the virus. A lockdown was imposed on the greater Accra and Greater Kumasi from 30th March 2020 to 22nd April 2020. The lockdown did not result in any load curtailment but a marginal reduction in demand. Even though the COVID-19 and its consequent lockdown did not lead to any load curtailment, it has led to the excess reduction in the availability of generation units. Units that are due for routine maintenance work are not being worked on and those offline due to forced maintenance remains offline.

Contrary to a projected increase in demand in the 2020 Electricity Supply Plan (ESP) from 3,064 MW in March 2020 to 3,093 MW in April 2020, Actual electricity demand reduced by 131.7 MW in April 2020 from 2,956.1 MW in March 2020 to 2,824.4 MW in April 2020. Ghana demand was also 216.6 MW lower than projected in the 2020 ESP for April 2020. Ghana demand for April 2020 was 2,546.4 MW which was lower than the projected 2,763 MW. Likewise, the average demand of 2,289.3 MW was 1.5% lower than the projected 2,325.3 MW in the 2020 ESP for April 2020. Average export demand of 207.3 MW was 12.2% higher than the projected 184.7 MW in the 2020 ESP for April 2020.

Electricity supply reduced by 1.5% in April 2020 contrary to projections in the 2020 ESP. Electricity supply in April 2020 was 1,648.35 GWh which was lower than the 1,674.2 GWh projected in the 2020 ESP for April 2020. Likewise, electricity export reduced in April

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

	April 2020		March 2020	
	Projected	Actual Outturn	Projected	Actual Outturn
Total Supply (GWh)	1,674.2	1,648.3	1,525.3	1,786.8
Source by Power Plants (GWh)				
AKOSOMBO	363.0	387.7	393.0	532.9
KPONG	70.0	73.1	80.0	78.1
BUI	75.0	104.9	110.0	125.0
Sunon Asogli	266.0	250.6	239.0	179.9
TAPCO	81.0	103.8	84.0	109.5
TICO	189.0	154.6	156.0	133.3
TT1PP	32.0	36.4	-	6.4
CENIT	74.0	67.6	77.0	24.4
TT2PP	-	15.7	-	4.8
Amandi	68.0	4.6	86.0	8.3
Karpowership	259.0	238.7	85.0	277.6
AMERI	121.0	116.1	139.0	127.2
KTTP	72.0	31.8	38.0	28.7
Trojan Power	-	-	-	-
CENPOWER	-	-	34.0	66.0
AKSA	-	17.4	-	47.8
Bridge Power	-	-	-	-
BXC Solar	2.0	2.5	2.0	2.7
Safisana	-	-	-	-
VRA Solar	0.2	0.2	0.3	0.3
Genser	-	36.8	-	37.1
Meinergy	2.0	2.2	2.0	2.3
Total Generation (GWh)	1,674.2	1,644.5	1,525.3	1,782.3
Imports (GWh)	-	3.9	-	4.5
Total Supply (GWh)	1,674.2	1,648.3	1,525.3	1,786.8
Deficit/Over supply (GWh)	-	(25.9)	-	261.3
Ghana Coincident Peak Load (MW)	2,763.0	2,546.4	2,734.0	2,691.1
System Coincident Peak Load (MW)	3,093.0	2,824.4	3,064.0	2,956.1

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2020 to 149.3 GWh contrary to a projected 166.9 GWh in the 2020 ESP.

The share of electricity generated from hydro sources in the total electricity supplied decreased from 41.2% in March 2020 to 34.2% in April 2020. Electricity generated from renewable energy remained the same at 0.29% of the total electricity supplied in both March 2020 and April 2020. The share of IPP generation in the total electricity supply increased from 50.2% March 2020 to 54.1% in April 2020.

The rate of drop in the water level for the Akosombo GS decreased by 44.8% in April 2020. The water level for the Akosombo Dam reduced from 0.06 feet per day in March 2020 to 0.03 feet per day in April 2020. Likewise, the rate of drop in the water level for the Bui dam decreased in March 2020 by 9.4% compared to April 2020. The rate of drop in the water level decreased from 0.21 feet per day in March 2020 to 0.19 feet per day 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 for March 2020 reduced by 4.5% from 2,956.1 MW in April 2020 to 2,824.4 MW in April 2020. There was no electricity import during the System Peak Load in April 2020. A total of 265 MW of electricity was exported to CIE, CEB and SONABEL at the System Peak Load in February 2020. Electricity generated from hydro sources contributed 39.7% of the System Peak Load and 44.1% of the Ghana Peak Load.

The Ghana Peak Load recorded in April 2020 decreased by 5.4% from 2,691.1 MW in March 2020 to 2,546.4 MW in April 2020. Average electricity demand decreased by 4.7%, from 2,401.6 MW in March 2020 to 2,289.3 MW in April 2020.

Average export demand for April 2020 decreased marginally by 7.6% compared to export demand for April 2020. Average export demand decreased from 224.3 MW in March 2020 to 207.3 MW in April 2020. Average Domestic demand decreased by 4.4% from 2,177.3 MW in March 2020 to 2,082 MW in April 2020. The System Load factor reduced from 79.3% in March 2020 to 79% in April 2020.

Electricity supply

The average electricity supplied in February 2020 decreased by 4.6%, from 57.6 GWh per day in March 2020 to 54.9 GWh per day in April 2020 consequently, the total electricity supplied in March 2020 decreased from 1,786.82 GWh in March 2020 to 1,648.35 GWh in April 2020. The total electricity supplied in April 2020 was made up of 3.86 GWh of from CIE and 1,644.48 GWh from domestic sources. Embedded generation contributed 2.5% of the total domestic supply. A total of 149.29 GWh was exported to CIE, CEB and SONABEL in April 2020. Out of the total electricity exported, 10.22 GWh was supplied to CIE, 55.13 GWh was supplied to CEB and 83.94 GWh to SONABEL. Average domestic consumption increased by 7.5% from 1,619.91 GWh in March 2020 to 1,499.06 GWh in April 2020.

Electricity generated from hydro sources contributed 34.3% of the total electricity supplied in March 2020, lower than its contribution of 41.2% in March 2020. Thermal generation contributed 65.2% of the total electricity supplied in April 2020, which was higher than the 58.3% it supplied in March 2020. The energy import and solar generation contributed 0.2% and 0.3% respectively to the total electricity supplied in April 2020.

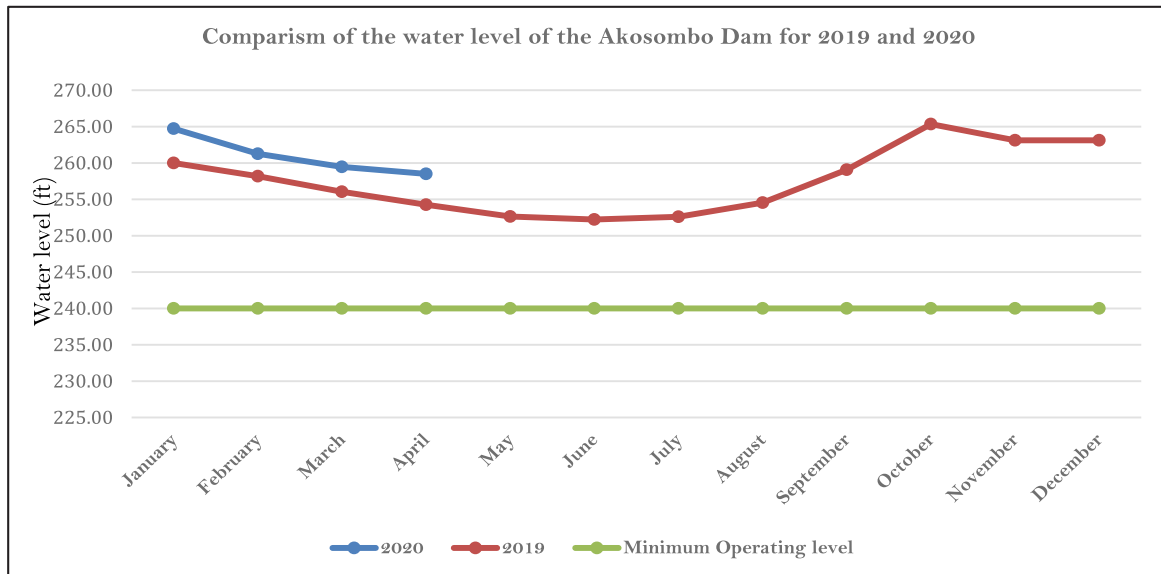
HYDRO DAM LEVELS

Akosombo Dam Water Level continued to drop at a reducing rate in April 2020

The Akosombo dam recorded a decrease in the rate of drop in the water level by 45.8%, from 0.059 feet per day in March 2020 to 0.032 feet per day in April 2020. The water level of the Akosombo dam dropped from 259.46 feet recorded at the beginning of the month to 258.5 feet at the end of the month. The water level recorded at the end of April 2020 was 4.24 feet above the water level recorded for the same period in 2019. Also, the water level recorded at the end of April 2020 was 18.5 feet above the minimum operating water level of the dam.

HIGHLIGHTS OF THE MONTH

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

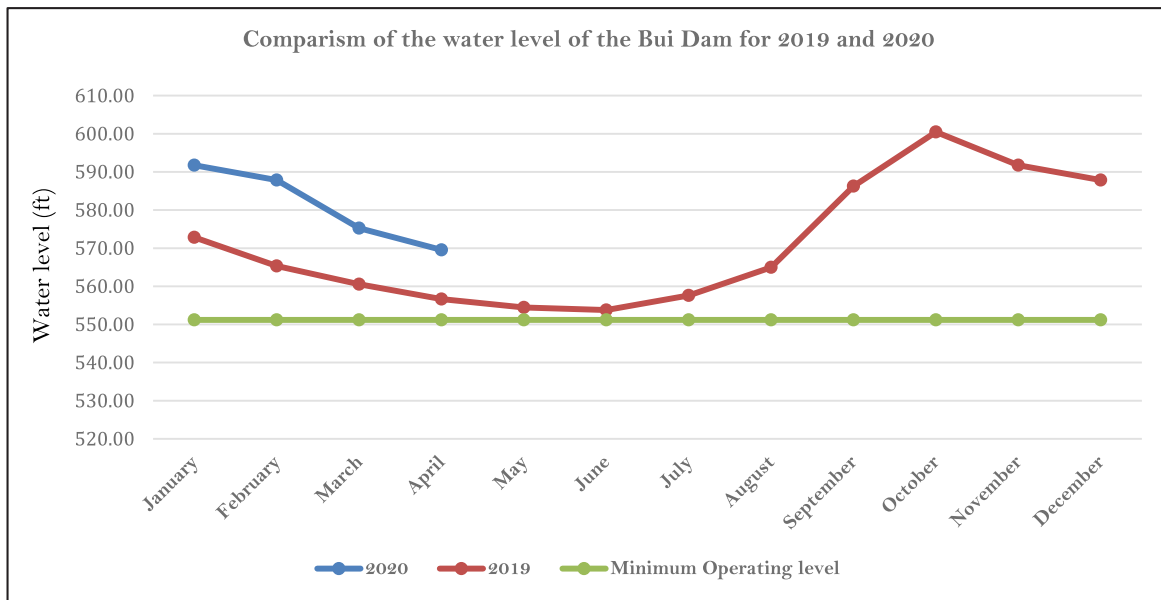


Bui Dam Water Level continued to drop at an increasing rate in April 2020

The Bui dam water level dropped at an increasing rate from 0.13 feet per day in March 2020 to 0.19 feet per day in April 2020. The water level at the beginning of the month stood at 575.26 feet which dropped to 569.55 feet at the end of the month. The water level recorded at the end of the month was 12.9 feet above the water level recorded for the same period in 2019. Also, the water level recorded at the end of the month was 18.37 feet above the minimum operating water level for the dam.

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

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



FUEL SUPPLY FOR POWER GENERATION

Natural gas import from the West Africa Gas Pipeline Company (WAPCo) increased in April 2020

The natural gas flow rate from the WAPCo increased by 29.4%, from 48.5 MMSCFD in March 2020 to 60.2 MMSCFD in April 2020. Consequently, the total natural gas supplied by WAGPCo increased from 1,504.6 MMSCF in March 2020 to 1,882.97 MMSCF in April 2020. Similarly, the share of WAPCo in the total fuel mix supplied increased from 17% in March 2020 to 19.6% in April 2020. On the contrary, the share of WAPCo in the total natural gas supply decreased from 20% in March 2020 to 19.9% in April 2020.

Domestic natural gas supply dominates the fuel supply mix.

Natural gas supply from the domestic sources increased from 197.4 MMSCFD in March 2020 to 249.18 MMSCFD in April 2020, representing a 26.2% increase in supply. Consequently, the total natural gas supply increased from 6,119.36 MMSCF in March 2020 to 7,475.45 MMSCF in April 2020. Natural gas supply from domestic sources accounted for 80.1% of the total natural gas supply and 79.1%

HIGHLIGHTS OF THE MONTH

of the total fuel mix. This was higher than the share of domestic supply in the total fuel mix and total natural gas supply of 67.8% and 80% respectively recorded in March 2020.

Liquid Fuel consumption reduced in April 2020

Liquid fuel consumption decreased from 261,089 barrels in March 2020 to 24,974 barrels in April 2020. This was primarily due to increased supply of natural gas from both domestic supply and import due to the completion of the WAPCo natural gas pipeline clean up. Liquid fuel supply in the fuel mix decreased from 15.2% in March 2020 to 1.5% in April 2020.

The share HFO in the total liquid fuel consumed increased from 26.6% in March 2020 to 94.9% in April 2020. In the total fuel mix, the share of HFO however decreased from 4% in March 2020 to 1.4% in April 2020. DFO consumption in the total liquid fuel consumption decreased from 21.9% in March 2020 to 5.1% in April 2020. Likewise, DFO consumption in the total fuel mix decreased from 3.3% in March 2020 to 0.1% in April 2020. There was no LCO consumption in April 2020.

Plant by Plant Highlights

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

The average electricity generated by the Akosombo GS decreased by 24.8%, from 17.19 GWh per day in March 2020 to 12.92 GWh per day. Similarly, the total electricity supplied by the Akosombo hydropower plant decreased from 532.95 GWh in March 2020 to 387.72 GWh in April 2020. The total electricity supplied by the hydropower plant constituted 23.5% of the total electricity supplied in April 2020 and was 6.8% less than the 363 GWh projected in the 2020 ESP. The Akosombo GS contributed a total of 772.1 MW to both the System Peak Load and the Ghana Peak Load in April 2020. This translates into 27.3% of the System Peak Load and 30.3% of the Ghana Peak Loads.

Electricity supply by Kpong Generation Station (GS) decreased in April 2020

There was a 3.2% decrease in the average electricity generated by the Kpong GS in April 2020, from 2.52 GWh per day in March to 2.44 GWh per day. Likewise, the total electricity supplied by the Kpong GS decreased from 78.07 GWh in March 2020 to 73.11 GWh in April 2020. The total electricity supplied by the hydropower plant contributed 4.4% of the total electricity supplied in April 2020 but was 10.3% higher than the projected 70 GWh in the 2019 ESP. The hydropower plant contributed 120 MW to both the System Peak Load and the Ghana Peak Load in April 2020 translating into 4.3% and 4.7% of the peak loads respectively.

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

The Bui GS electricity generation increased from 4.03 GWh per day in March 2020 to 3.5 GWh per day in April 2020. This represents a 13.2% increase in generation. Consequently, the total electricity supplied by the Bui GS decreased from 125 GWh in March 2020 to 104.85 GWh in April 2020. The total electricity generated by the hydropower plant constituted 6.4% of the total electricity supplied in April 2020 and was 36.7% higher than the 75 GWh projected in the 2020 ESP. The hydropower plant contributed 230.3 MW to both the System Peak Load and the Ghana Peak Load in April 2020, translating into 8.2% and 9% of the peak loads respectively.

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

The SAPP electricity generation decreased from 5.8 GWh per day in March 2020 to 8.35 GWh per day in April 2020, representing a 44% decrease in generation. Consequently, the total electricity supplied by the SAPP increased from 179.87 GWh in March 2020 to 250.6 GWh in April 2020. The total electricity generated by the power plant constituted 15.2% of the total electricity supplied in April 2020 and was 5.8% lower than the 266 GWh projected in the 2020 ESP. The power plant contributed 363.2 MW to both the System Peak Load and the Ghana Peak Load in April 2020, translating into 12.7% and 14.3% of the peak loads respectively. The SAPP consumed 1,937.29 MMSCF of natural gas in April 2020 at an average heat rate of 8,252.12 Btu/kWh, which was lower than the 8,282 Btu/kWh recorded in March 2020.

Ameri Energy Power Plant's generation decreased in April 2020

There was an increase in the electricity generated by the Ameri power plant by 5.6% in April 2020 from 4.01 GWh per day in March 2020 to 3.87 GWh per day. Similarly, the total electricity supplied by the thermal power plant decreased from 127.19 GWh in March 2020 to 116.1 GWh in April 2020. The total electricity supplied by the thermal power plant constituted 7.1% of the total electricity supplied in March 2020 and was 4% lower than the 121 GWh projected in the 2020 ESP. The Ameri power plant contributed 213.6 MW to both the System Peak Load and the Ghana Peak Load in April 2020 representing 7.6% and 8.4% of the peak loads respectively. The thermal power plant consumed a total of 1,107.62 MMSCF of natural gas at an estimated heat rate of 10,112.67 Btu/kWh in April, 2020, which was lower than the 10,381.6 Btu/kWh recorded in March 2020.

The Karpowership Power Plant's generation decreased in April 2020

There was a decrease in the total electricity supplied by the Karpowership by 11.1% in April 2020 from 8.96 GWh per day in March 2020 to 7.96 GWh per day. The total electricity supplied by the thermal power plant decreased from 277.61 GWh in March 2020 to 238.66 GWh in April 2020. The Karpowership's total electricity generated constituted 14.5% of the total electricity supplied in April 2020 and was 7.9% lower than the 259 GWh projected in the 2020 ESP. The thermal power plant contributed 409.2 MW to both the System Peak Load and the Ghana Peak Load in February 2020 representing 14.5% and 16.1% of the peak loads respectively. A total of 1,713.58 MMSCF of natural gas was consumed by the thermal power plant at an estimated heat rate of 8,063.15 Btu/kWh in April 2020, which was higher than the 7,981.83 Btu/kWh recorded in March 2020.

AKSA Power Plant's generation decreased in April 2020

The AKSA power plant recorded a decrease in electricity generated in April 2020 by over 1.6 folds. The average electricity generated by the thermal power plant decreased from 1.54 GWh per day in March 2020 to 0.58 GWh per day in April 2020. Consequently, the total electricity supplied by the thermal power plant decreased from 47.84 GWh in April 2020 to 17.42 GWh in April 2020. The total electricity generated by the AKSA power plant contributed 1.1% of the total electricity supplied in April 2020 and the power plant was not projected to be online in April 2020 according to the 2020 ESP. AKSA contributed 110.2 MW both the System Peak Load and the Ghana Peak Load in April 2020 representing 3.9% and 4.3% of the peak loads respectively. The thermal power plant consumed a total of 23,550 barrels of HFO at an estimated heat rate of 8,178.17 Btu/kWh in April 2020, which was higher than the 8,158.96 Btu/kWh recorded in March 2020.

Takoradi International Company (TICO) generation increased in April 2020

The average electricity generated by TICO increased by 29.4%, from 3.98 GWh per day in March 2020 to 5.15 GWh in April 2020. Consequently, the total electricity generated by the thermal power plant increased from 123.34 GWh in March 2020 to 154.55 GWh in April

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2020. The total electricity generated by TICO constituted 9.4% of the total electricity supplied in March 2020 and was 18.2% lower than 189 GWh projected in the 2020 ESP. TICO contributed a total of 220 MW to both the System Peak Load and the Ghana Peak Load, representing 7.8% and 8.6% of the peak loads in April 2020 respectively. The thermal power plant consumed a total of 1,719.59 MMSCF of natural gas at an estimated heat rate of 11,794.04 Btu/kWh in April 2020, which was lower than the 12,276.09 Btu/kWh recorded in March 2020. 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.

Takoradi Power Company (TAPCO) Plant's generation decreased in April 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.

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

The KTPP generated an average of 1.03 GWh per day in April 2020 which was 14.3% higher than the 0.93 GWh per day electricity generated in March 2020. The power plant generated a total of 28.74 GWh in March 2020 compared to 31.78 GWh in April 2020. The total electricity generated constituted 1.9% of the total electricity supplied in April 2020. The power plant contributed 100 MW to both the System Peak Load and the Ghana Peak Load, representing 3.5% and 3.9% of peak loads in February 2020 respectively. The thermal power plant consumed a total of 1,423.4 barrels of DFO and 337.4 MMSCF of natural gas at an estimated heat rate of 11,572.17 Btu/kWh in April 2020 compared to 10,966.47 Btu/kWh in March 2020.

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

The TT1PP generated 36.36 GWh of electricity in April 2020 which was 13.6% higher than the projected 32 GWh in the 2020 ESP. The total electricity generated by the power plant constituted 2.2% of the total electricity supplied in April 2020. The TT1PP did not contribute to both the System Peak Load and the Ghana Peak Load in April 2020. The power plant consumed 411.41 MMSCF of natural gas in April 2020 at an average heat rate of 12,079 Btu/kWh.

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

The CENIT power plant operated fully in April 2020 generating 67.63 GWh which was higher than the 24.42 GWh generated in March 2020. The generation from the power plant was 8.6% lower than the projected 74 GWh in the 2020 ESP. The power plant contributed 108 MW to both the System Peak Load and Ghana Peak Load in 2020 representing 3.8% and 4.2% of both peak loads respectively. The CENIT power plant consumed 684.41 MMSCF of natural gas at an average heat rate of 11,141.7 Btu/kWh in April 2020.

Cenpower power plant shutdown in April 2020

The Cenpower power plant was offline in April 2020. The power plant operated from January 2020 to March 2020 on LCO to make up for shortfalls in supply due to the WAPCo pipeline clean-up which spanned from the last week of January 2020 to March 2020.

Embedded Electricity Generation

Genser Power Plant's generation increased in April 2020

The average electricity supplied by Genser power plant increased by 2.5%, from 1.2 GWh per day in March 2020 to 1.23 GWh per day in April 2020. On the contrary, the total electricity supplied by the thermal power plant decreased from 37.12 GWh in March 2020 to 36.8 GWh in April 2020 due to a higher number of days in March than in April. The total electricity supplied by the thermal power plant constituted 2.2% of the total electricity supplied in April 2020. A total of 387.92 MMSCF of natural gas at an estimated heat rate of 11,606.11 Btu/kWh in April 2020, which was higher than the 11,371.95 Btu/kWh in March 2020.

BXC Solar generation decreased in April 2020

There was a decrease in the total electricity supplied by the BXC solar power plant by 4.7%, from 0.086 GWh per day in March 2020 to 0.082 GWh per day in April 2020. Consequently, the total electricity generated by the power plant decreased from 2.68 GWh in March 2020 to 2.47 GWh in April 2020. The generation from BXC Solar constituted 0.15% of the total electricity supplied in April 2020.

Meinergy Solar generation decreased in April 2020

The Meinergy Solar power plant decrease from 0.073 GWh per day in March 2020 to 0.072 GWh per day in April 2020. Consequently, the total electricity generated by the power plant decreased from 2.27 GWh in March 2020 to 2.16 GWh in April 2020. The generation from Meinergy Solar constituted 0.13% of the total electricity supplied in April 2020.

Electricity Exchange – Import decreased whilst Export decreased in April 2020

The average electricity import decreased in April 2020 by 11%, from 0.15 GWh per day in March 2020 to 0.13 GWh per day in April 2020. Similarly, the total electricity imported from CIE decreased from 4.54 GWh in March 2020 to 3.86 GWh in April 2020. The total electricity imported constituted 0.2% of the total electricity supplied in April 2020.

There was a decrease in the total average electricity exported to CIE, CEB and SONABEL from 5.34 GWh per day in March 2020 to 4.98 GWh per day in April 2020. Electricity exported to CIE, CEB and SONABEL decreased from 166.91 GWh in March 2020 to 149.29 GWh in April 2020. Of the total electricity exported, 36.9% was exported to CEB, 6.8% to CIE and 56.2% to SONABEL.

Average export demand reduced to 207.4 MW in April 2020 from 224.4 MW representing a 7.6% decrease in demand. Export demand for CEB and CIE reduced by 21.8% and 17.9% from 98 MW and 17.3 MW in March 2020 to 76.6 MW and 14.2 MW in April 2020 respectively. Export demand to SONABEL, on the other hand, increased by 6.9% from 109.1 MW in March 2020 to 116.6 MW in April 2020.

Ghana continued to be a net exporter of electricity in April 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

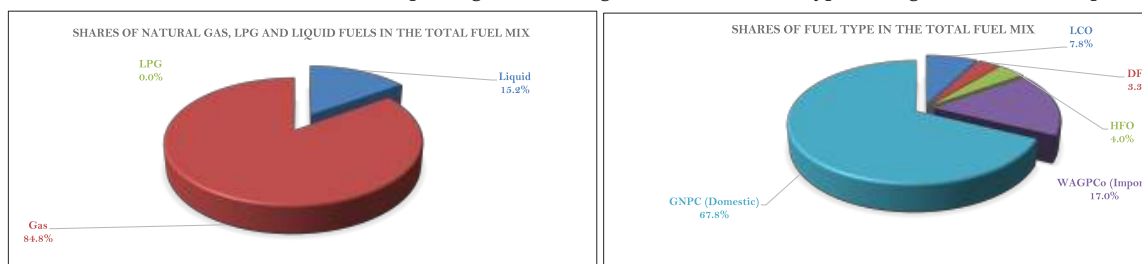


Figure 4a: Contribution of Natural Gas Supply by sources

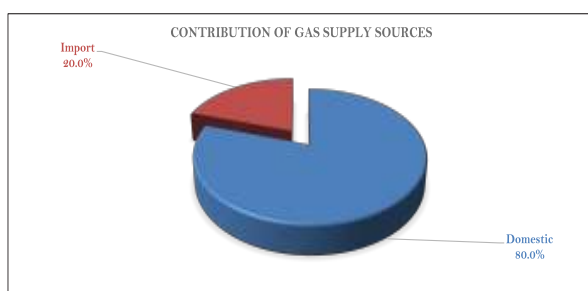
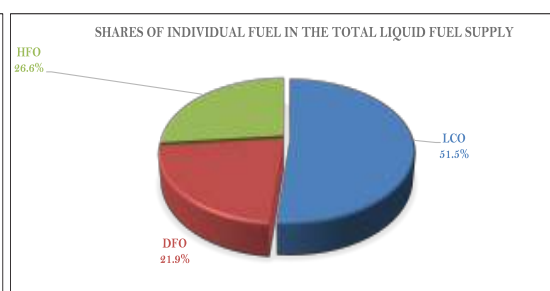


Figure 4b: Contribution of individual fuel in the liquid fuel supply

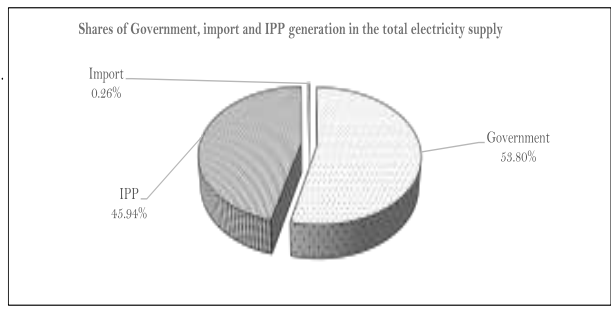
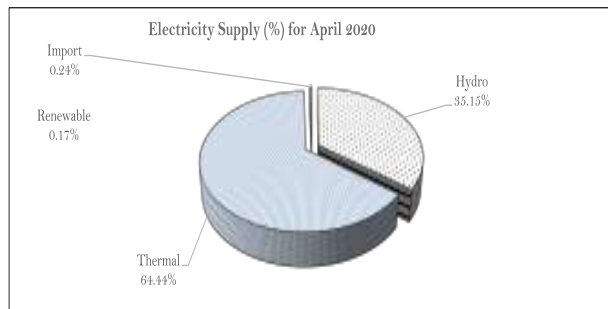


Peak Electricity Supply - April 2020			
Source of Supply	Generation at System Peak Load (MW)	Generation at Ghana Peak Load (MW)	Electricity Supply (GWh)
AKOSOMBO	772.10	772.10	387.72
KPONG	120.00	120.00	73.11
BUI	230.30	230.30	104.85
SEAP	363.20	363.20	250.60
TAPCO	153.00	153.00	103.77
TICO	220.00	220.00	154.55
TT1PP	-	-	36.36
CENIT	108.00	108.00	67.63
TT2PP	24.80	24.80	15.68
Amandi	-	-	4.59
KARPOWER	409.20	409.20	238.66
AMERI	213.60	213.60	116.10
KTPP	100.00	100.00	31.78
Trojan Power	-	-	-
CENPOWER	-	-	-
AKSA	110.20	110.20	17.42
Bridge Power	-	-	-
BXC Solar	-	-	2.47
Safisana	-	-	-
VRA Solar	-	-	0.22
Genser	-	-	36.80
Meinergy	-	-	2.16
IMPORT	2,824.40	2,824.40	3.86
Export to CIE	53.00	53.00	55.13
Export to CEB	83.00	83.00	10.22
Export to Sonabel	142.00	142.00	83.94
System Coincident Peak Load	2,824.40		
Ghana Coincedent Peak Load		2,546.40	
Total Supply			1,648.35
Total Supply without export			1,499.06

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

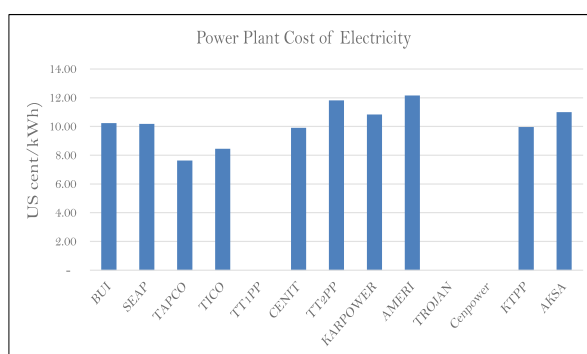
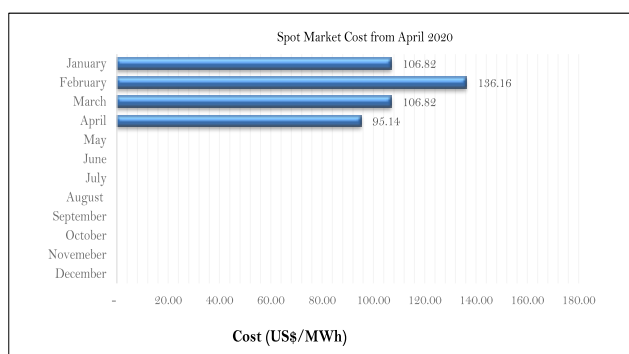
Apr-20			
	Beginning month (ft)	End month (ft)	Change in water level (feet)
Hydro Dam			
Akosombo	259.46	258.50	-0.96
Bui	575.26	569.55	-5.71



Power Plant Data April 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	51.09	387.72	-	-	-	-	-
Kpong	160.00	61.42	73.11	-	-	-	-	-
Bui	400.00	35.23	104.85	-	-	-	-	-
SEAP	560.00	60.15	250.60	2,067,983.34	-	-	-	-
TAPCO	330.00	42.26	103.77	878,221.24	-	-	-	-
TICO	340.00	61.10	154.55	1,212,503.51	-	-	-	-
TT1PP	126.00	38.78	36.36	439,165.85	-	-	-	-
CENIT	126.00	72.14	67.63	753,533.97	-	-	-	-
TT2PP	87.00	24.22	15.68	202,309.21	-	-	-	-
KARPOWER	470.00	68.25	238.66	1,924,354.34	-	-	-	-
AMERI	250.00	62.42	116.10	1,174,081.07	-	-	-	-
Cenpower	370.00	-	-	-	-	-	-	-
TROJAN	56.00	-	-	-	-	-	-	-
KTPP	220.00	19.42	31.78	360,162.40	-	7,643.87	-	-
KSA	360.00	6.50	17.42	-	-	-	142,480.07	-
Amandi	-	-	4.59	43,919.60	-	-	-	-
Bridge Power	-	-	-	-	-	-	-	-
GENSER	95.00	52.07	36.80	427,104.73	-	-	-	-
VRA Solar	2.50	11.99	0.22	-	-	-	-	-
BXC	20.00	16.61	2.47	-	-	-	-	-
Meinergy	20.00	14.54	2.16	-	-	-	-	-
Total	5,012.50	44.10	1,644.48	9,483,339.27	-	7,643.87	142,480.07	-

ECONOMIC FACT SHEET

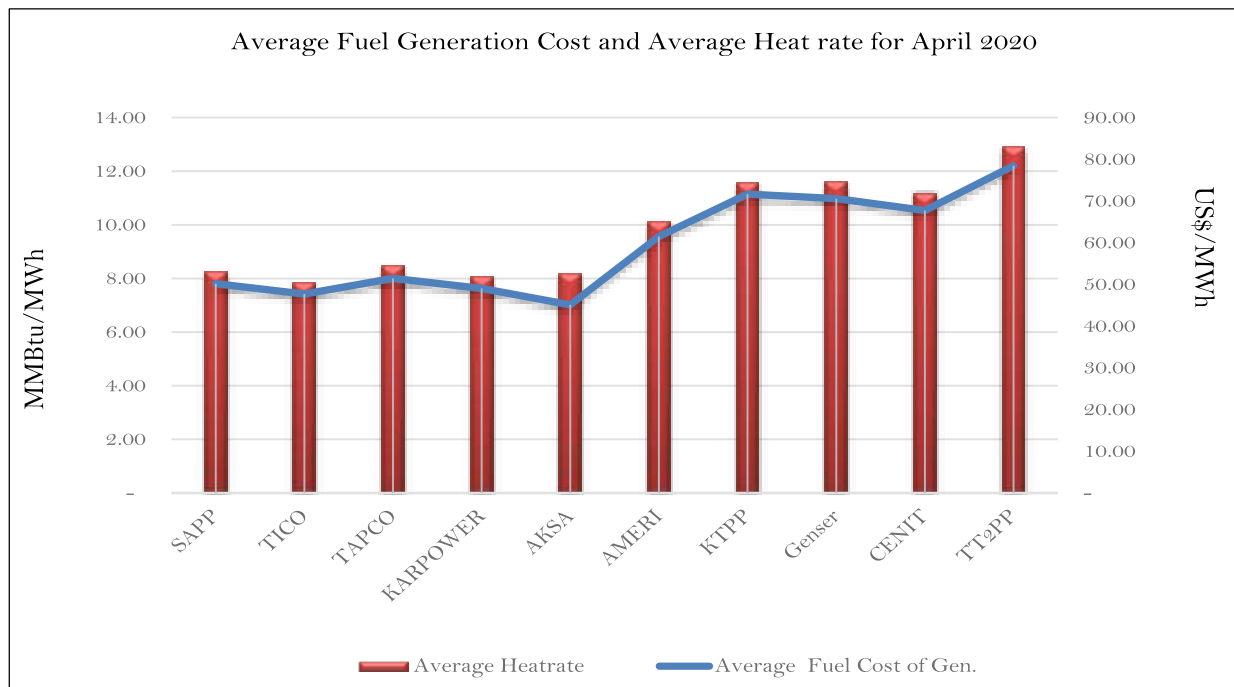
		Actual	Projected	Difference
Average Market Energy Cost	US\$/MWh	60.58	57.83	2.75
Average Market Capacity Charge (AMCC)	US\$/MWh	39.25	43.17	(3.91)
Total Average Market Cost (TAC)	US\$/MWh	99.84	101.00	(1.16)
System Marginal Cost (SMC)	US\$/MWh	77.36	61.37	15.99
System Marginal Capacity Charge (SMCC)	US\$/MWh	23.95	23.95	-
Spot Market Price (SMP)	US\$/MWh	101.31	85.32	15.99
Composite Bulk Generation Charge (CBGC)	US\$/MWh	87.17	87.17	-
Deviation of TAC from CBGC	US\$/MWh	(12.67)	(13.83)	1.16
Deviation of SMP from CBGC	US\$/MWh	(14.14)	1.85	(15.99)



	Gazetted Natural Gas Price	Weighted average Natural Gas Price	LCO	HFO	DFO	LPG
US\$/MMBTu	6.08	6.29	4.42	5.52	11.46	11.05

Average Fuel Prices		
		Apr-20
Fuel Type	Unit	Delivered Cost
Natural Gas	US\$/MMBTu	6.08
LCO	US\$/BBL	23.38
HFO	US\$/Tonne	153.85
DFO	US\$/Tonne	463.00
LPG	US\$/Tonne	471.16

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	51.09	-	-	-
Kpong	61.42	-	-	-
Bui	35.23	-	-	-
SAPP	60.15	8,252.12	50.17	0.44
TAPCO	42.26	8,463.40	51.46	0.45
TICO	61.10	7,845.38	47.70	0.42
TT1PP	38.78	12,078.93	73.44	0.64
CENIT	72.14	11,141.76	67.74	0.59
TT2PP	24.22	12,905.83	78.47	0.68
KARPOWER	68.25	8,063.15	49.02	-
AMERI	62.42	10,112.67	61.49	0.54
TROJAN	-	-	-	-
KTPP	19.42	11,572.17	71.65	0.01
AKSA	6.50	8,178.17	45.12	0.64
Cenpower	-	-	-	-
Genser	52.07	11,606.11	70.57	0.62

Impact of COVID 19 on electricity generation

The World Health Organization (WHO) states that pneumonia of unknown cause was detected in Wuhan which was first reported to the WHO Country Office in China on 31 December 2019. The WHO declared pneumonia as a Public Health Emergency of International Concern on 30 January 2020. On 11 February 2020, the WHO announced that the new coronavirus disease will be named COVID-19. The COVID-19 virus is a new virus linked to the same family of viruses as Severe Acute Respiratory Syndrome (SARS) and some types of a common cold.

According to the WHO, the virus is transmitted through direct contact with respiratory droplets of an infected person (generated through coughing and sneezing), and touching surfaces contaminated with the virus. The COVID-19 virus may survive on surfaces for several hours, but simple disinfectants can kill it.

Symptoms can include fever, cough and shortness of breath. In more severe cases, an infection can cause pneumonia or breathing difficulties. More rarely, the disease can be fatal. From the WHO, these symptoms are similar to the flu (influenza) or the common cold, which are a lot more common than COVID-19. This is why testing is required to confirm if someone has COVID-19.

The preventive measures according to the WHO are frequent hand washing, and respiratory hygiene (cover your cough or sneeze with a flexed elbow or tissue, then throw away the tissue into a closed bin).

Ghana recorded its first case of COVID 19 on the 12th March 2020. As at the end of April 2020, Ghana had recorded 2,074 cases with 17 deaths. Over 1,438 new cases were registered since the 15th April 2020. As at the end of April 2020, Ghana had the highest number of confirmed cases in West and Central Africa and the third across Africa following South Africa and Algeria.

Government of Ghana has set five objectives in combating the pandemic:

1. Limit and stop the importation of the virus;
2. Contain the spread;
3. Provide adequate care to the sick;
4. Limit the impact on social and economic life; and
5. Inspire the expansion of its domestic and deepen its self-reliance.

Government response to limiting and stopping the importation of the virus in the country on the 15th March 2020 closed the borders of Ghana to all foreigners from countries with more than 200 reported COVID 19 cases but allow for Ghanaians and persons with Ghanaian work permits. On the 22nd March 2020 the Government closed the borders of Ghana to all persons. This means that no person is allowed to leave or enter the country.

The government placed restrictions on public gathering of all kinds and on the 30th March 2020 placed a ban on movement in Greater Accra and Greater Kumasi. This restriction did not include persons working in the energy sector. The bans on movement in these areas were lifted on the 22nd April 2020 with the imposition of additional measures to limit the spread of the virus.

The Electricity Market Oversight Panel as a regulator of the Ghana Wholesale Electricity Market in March 2020 instigated a study on the impact of COVID 19 on the electricity supply industry especially power generators. The EMOP developed questionnaires to be completed by power plant operators on the impact of COVID 19 on their operation. In preparing the questionnaire, the EMOP considered activities that could be impaired by COVID 19 restrictions. These activities include planned maintenance work, forced maintenance work, fuel supply and staff availability.

Electricity demand reduced by 4.4% from 2,956.1 MW in March 2020 to 2,824.4 MW in April 2020. Likewise, electricity demand for April 2020 was 8.7% lower than projected in the 2020 ESP. Likewise, electricity supply reduced by 4.8% in April 2020 and was 1.5% lower than projected in the 2020 ESP. Reduction in electricity supply may be attributed to the lockdown as a result of COVID-19 as some companies and institutions closed down or reduced workforce and production to achieve the required social distancing to prevent the spread of the virus. Even though the COVID-19 and its consequent lockdown did not lead to any load curtailment, it has led to the unavailability of some generation units.

A total of 13 generation plants responded to EMOP's questionnaire, eight (8) Government of Ghana (GoG) plants and five (5) IPP. Four power plants had planned maintenance in March 2020 to April 2020. These included run-time hours, borescope inspection, repair works, hot gas path inspection and five (5) yearly level 'A' maintenance. Three (3) out of the four (4) power plants were unable to undertake these maintenance work due to COVID 19 restrictions. This they explained was due to the inability of expatriate consultants and engineering to enter the country due to the closure of the borders and the need for social distancing that limits the number of workers undertaking the maintenance.

Two (2) power plants had forced maintenance work to be undertaken within the period. One was unable to undertake the forced maintenance work due to the closure of the borders. The unit is still offline waiting for the arrival of engineers and consultants for the repair works.

To ensure appropriate social distancing, stations had to reduce their workforce, with some on rotation and others on working from home. It did not affect the overall output of the power plant but it meant that workers have to work extra.

Mandatory or forced maintenance works are important in maintaining the efficiency and reliability of the power plant. Therefore, power plant operators make it imperative not to miss any maintenance work as it can have dire consequences on power supply and their contractual obligation.

Other Market News and Trends

For this reason, the GoG has given special dispensation to all expatriate workers providing power supply related services or activities in the country. The Ministry of Energy representing the GoG, therefore, request stakeholders (power plant operators) to inform the Ministry of Energy in writing ahead of time to allow the Ministry to make the necessary preparations. The Ministry also re-iterated that expatriate and critical workers will undergo all necessary safety protocols including mandatory quarantine upon arrival to Ghana.

The COVID-19 has led to changes in lifestyle patterns and work patterns of several institutions. These changes would impact on the supply and demand for electricity in the coming months and even longer if a cure or vaccine is not developed for the virus. It is therefore important for a review of electricity demand and supply projections for the short to medium term to incorporate the impact of COVID-19. The Energy Commission should undertake a study to determine the possible change in electricity consumption patterns in Ghana and the needed supply interventions required.

Acronyms

<i>AGPP = Atuabu Gas Processing Plant</i>	<i>Btu = British Thermal Units</i>
<i>CBGC = Composite Bulk Generation Charge</i>	<i>CUF = Capacity Utilization Factor</i>
<i>DFO = Distillate Fuel Oil</i>	<i>EC = Energy Commission</i>
<i>ECG = Electricity Company of Ghana</i>	<i>EMOP = Electricity Market Oversight Panel</i>
<i>ESP = Electricity Supply Plan</i>	<i>FPSO = Floating Production, Storage and Offloading</i>
<i>GHp = Ghana Pesewa</i>	<i>GNGC = Ghana National Gas Company</i>
<i>GWh = Giga-watt Hours</i>	<i>HFO = Heavy Fuel Oil</i>
<i>KTPP = Kpone Thermal Power Plant</i>	<i>kWh = Kilo-watt hours</i>
<i>MRP = Mine Reserve Plant</i>	<i>LEAP = Long-range Energy Alternative Planning</i>
<i>LCO = Light Crude Oil</i>	<i>LI = Legislative Instrument</i>
<i>LTA = Long Term Average</i>	<i>MW = Megawatt</i>
<i>MMscf = Million Standard Cubic Feet</i>	<i>MWh = Mega-watt hours</i>
<i>NITS = National Interconnected Transmission System</i>	<i>PV = Photovoltaic</i>
<i>SAPP = Sunon Asogli Power Plant</i>	<i>SMP = System Marginal Price</i>
<i>SNEP = Strategic National Energy Plan</i>	<i>TEN = Tweneboa, Enyenra, Ntomme</i>
<i>TT2PP = Tema Thermal 2 Power Plant</i>	<i>TT2PP = Tema Thermal 2 Power Plant</i>
<i>VRA = Volta River Authority</i>	<i>WAGPCo = West African Gas Pipeline Company</i>
<i>WAGP = West African Gas Pipeline</i>	<i>WEM = Wholesale Electricity Market</i>

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