



GHANA WHOLESALE ELECTRICITY MARKET BULLETIN

MARKET WATCH

Monthly Market Data Analysis

ISSUE NO. 38

1st February 2019 to 28th February 2019

This Bulletin covers major developments in the Wholesale Electricity Market (WEM) of Ghana from 1st February, 2019 to 28th February, 2019. 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 projection of Market Prices for 2019.

The Energy Commission (EC) 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 continued to increase in February 2019, from 2,525 MW in December 2018 and 2,526 MW in January 2019 to 2,691.2 MW. This System Peak Load recorded in February 2019 was 5% higher than the 2,564 MW projected in the 2019 Electricity Supply Plan (ESP). Similarly, the Ghana Peak Load of 2,523.2 MW recorded in the same period was 3.2% higher than the 2,446 MW projected in the 2019 ESP. The System Peak Load increased over the past few months predominantly due to increases in domestic demand. Electricity import from CIE during the System Peak Load for February 2019 was 16 MW whilst export to CEB and SONABEL were recorded at 103 MW and 65 MW respectively. The total electricity exported to CEB and SONABEL was 42.3% higher than the 118 MW that was projected in the 2019 ESP.

A total electricity of 1,451.39 GWh was supplied in February 2019 and this was 8.7% lower than the 1,335.4 GWh that was projected in the 2019 ESP. Similarly, a total electricity of 1,362 GWh was consumed domestically, and that was 6.9% higher than the 1,274.1 GWh projected in the 2019 ESP. A total of 89.39 GWh of electricity was exported to CIE, CEB and SONABEL which was 45.8% higher than the 61.3 GWh projected in the 2019 ESP.

Electricity generation from hydro sources contributed 51% of the total electricity supplied in February 2019 which was marginally lower than the 51.5% it recorded in January 2019. Similarly, supply from thermal sources contributed 48.1% of the total electricity supplied in February 2019 which was marginally lower than the 48.4%

Table 1. Projected and Actual Outturn of electricity demand and supply in January 2019 and February 2019.

	February 2019		January 2019	
	Projected	Actual Outturn	Projected	Actual Outturn
Total Supply (GWh)	1,335.3	1,451.4	1,485.1	1,537.1
Source by Power Plants (GWh)				
AKOSOMBO	540.6	559.4	377.1	552.0
KPONG	61.0	74.5	67.6	78.1
BUI	49.9	126.1	55.2	156.0
Sunon Asogli	155.5	125.7	176.2	165.6
TAPCO	79.4	118.2	86.0	124.9
TICO	182.8	98.1	173.8	68.7
TT1PP	36.7	20.4	-	3.2
CENT	-	-	-	-
TT2PP	-	6.8	-	-
MRP	-	-	-	-
Karpowership	231.9	172.0	256.7	89.6
AMERI	139.1	151.8	154.0	158.1
KTPP	-	-	43.6	42.4
Trojan Power	-	-	-	-
CENPOWER	-	1.6	-	6.9
AKSA	56.0	30.8	90.0	46.3
BXC Solar	2.1	1.4	2.3	1.8
VRA Solar	0.2	0.2	0.3	0.3
Genset	-	32.7	-	32.3
Melnergy	2.1	1.4	2.3	1.3
Total Generation (GWh)	1,335.3	1,441.2	1,485.1	1,527.6
Imports (GWh)	-	10.2	-	9.6
Total Supply (GWh)	1,335.3	1,451.4	1,485.1	1,537.1
Deficit/Over supply (GWh)	-	116.1	-	52.0
Ghana Coincident Peak Load (MW)	2,446.0	2,523.2	2,436.0	2,412.2
System Coincident Peak Load (MW)	2,564.0	2,691.2	2,554.0	2,526.2

HIGHLIGHTS OF THE MONTH

recorded in January 2019.

The rate of drop in the water level for the hydro dams increased in February 2019. The water level for the Akosombo dam dropped at a rate of 0.07 feet per day which was higher than the 0.06 feet per day recorded in January 2019. Likewise, the rate of drop in the water level for the Bui dam increased marginally from 0.25 feet per day (0.08 meters) in January 2019 to 0.27 feet per day (0.08 meters) in February 2019.

The consumption of natural gas continued to dominate the total fuel mix but at a reduced rate, from 78.6% in January 2019 to 69.1% in February 2019. On the contrary, the consumption of liquid fuel in the total fuel mix increased from 16.3% in January 2019 to 25.2% in February 2019. The share of LPG in the total mix increased from 5.1% in January 2019 to 5.7% in February 2019.

ELECTRICITY DEMAND AND SUPPLY

Electricity Demand

The System Peak Load increased by 6.5% in February 2019, from 2,526.2 MW in January 2019 to 2,691.2 MW. Similarly, the Ghana Peak Load increased by 6.6%, from 2,412.2 MW in January 2019 to 2,523.2 MW in February 2019. The System Peak Load has been growing at a monthly average of 2.2% from November 2018 to February 2019. The growth in the System Peak Load has been predominantly due to growth in domestic demand from 2,471.4 MW in November 2018 to 2,691.2 MW in February 2019. A total of 168 MW was exported to both the CEB and SONABEL at the System Peak Load. Out of the total load exported, 103 MW was supplied to CEB and 65 MW to SONABEL. Average electricity demand grew by 4.5% to 2,159.6 MW in February 2019 from 2,066 MW in January 2019. The Load Factor in February 2019 reduced to 78%, from 79.6% in January 2019. Electricity generation from hydro sources contributed 48% of the total load served during the System Peak Load in February 2019.

Electricity supply

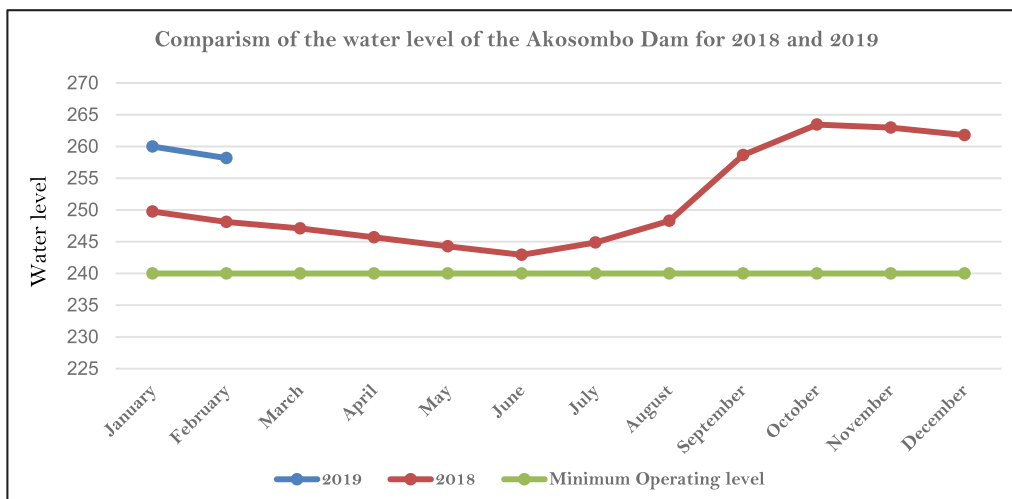
There was an increase in average electricity supply in February 2019 by 4.4%, from 49.34 GWh per day in January 2019 to 51.83 GWh per day. On the contrary, the total electricity supplied decreased by 5.7%, from 1,539.23 GWh in January 2019 to 1,451.24 GWh in February 2019. The reduction in the total electricity supplied was due to less number of days in February than January. Out of the total electricity supplied, 10.15 GWh was imported from CIE with the remaining from domestic sources. A total of 89.39 GWh was exported in the proportion of 6.07 GW to CIE, 47.96 GWh to CEB and 35.36 GWh to SONABEL. Electricity generated from hydro sources contributed 51% of the total electricity supplied in February 2019.

HYDRO DAM LEVELS

Akosombo Dam Water Level continued to drop in February 2019

The water level for the Akosombo GS continued to drop at an increasing rate, from 0.04 feet per day in December 2018 and 0.06 feet per day in January 2019 to 0.07 feet per day in February 2019. The water level of 260 feet recorded at the beginning of the month dropped by 1.82 feet to 258.18 feet. The increase in the rate of drop in the water level was due to an increase in electricity generation by the power plant. The water level recorded at the end of the month was 18.2 feet above the minimum water level of 240 feet recorded at the end of February 2018.

Figure 1: Month-End Water Level for Akosombo Dam from January 2018 to February 2019



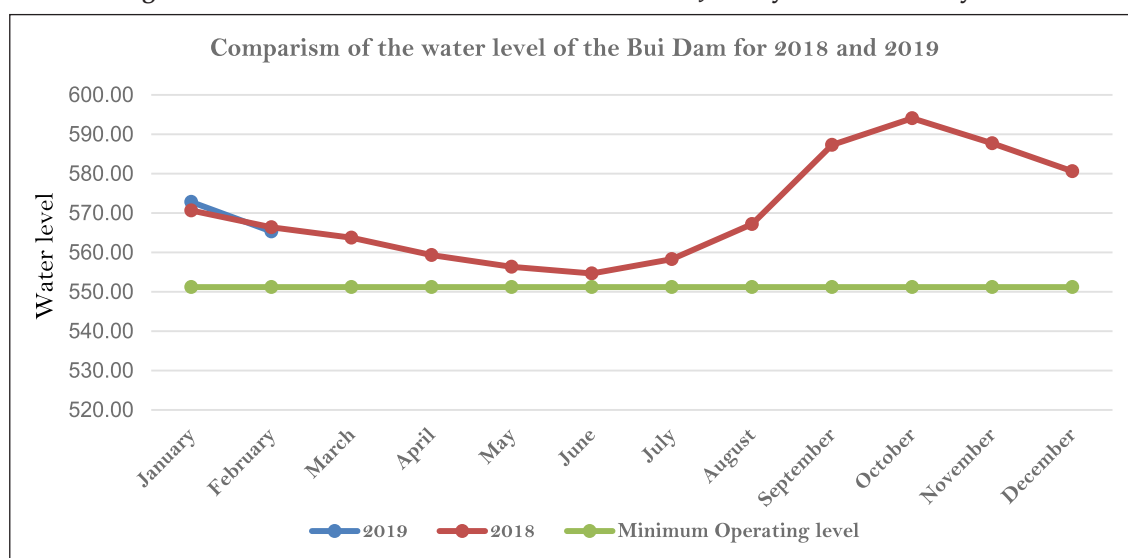
HIGHLIGHTS OF THE MONTH

Bui Dam Water Level continued to drop in February 2019

The rate of drop in the water level for the Bui dam increased from 0.25 feet per day (0.08 meters) in January 2019 to 0.27 feet per day (0.08 meters) in February 2019. The water level of 572.83 feet (174.6 meters) recorded at the beginning of the month dropped by 7.51 feet (2.29 meters) to 565.31 feet (172.31 meters) at the end of the month. The water level recorded at the end of the month was 1.08 feet (0.33 meters) below the water level of 566.39 feet (172.64 meters) recorded for the same period in 2018.

Figure 2 shows comparative end of month trajectory of the level of water in the Bui dam from January 2018 to February 2019.

Figure 2: Month-End Water Level for Bui Dam from January 2018 to February 2019



FUEL SUPPLY FOR POWER GENERATION

Natural gas flow rate from WAGPCo decreased in February 2019

Average flow rate of natural gas from WAGPCo to Tema and Kpone reduced by 13.1%, from 54.49 MMSCFD in January 2019 to 47.35 MMSCFD in February 2019. Consequently, the total natural gas consumed at Tema and Kpone reduced from 1,771.93 MMSCF in January 2019 to 1,278.1 MMSCF in February 2019. The total natural gas supplied by WAGPCo constituted 20.6% of the total fuel consumed, which was lower than the 25.7% recorded in January 2019. In the total natural gas consumed, the share of WAGPCo decreased from 32.8% in January 2019 to 29.7% in February 2019.

Natural gas flow rate from GNGC decreased in February 2019.

The supply of natural gas from GNGC lasted for 7 days in February 2019 due to the gas release from PV breaker (Cargo tanks) on the FPSO. Before the curtailment, average natural gas supply from GNGC was 41.52 MMSCFD. Consequently, a total of 290.63 MMSCF was supplied to the Aboadze Power Enclave. The total natural gas supplied by GNGC constituted 6.5% of the total natural gas consumed and 4.5% of the total fuel mix in February 2019.

Natural gas flow from GNPC increased in February 2019

Average natural gas supply from GNPC to the Aboadze Power Enclave increased significantly by 75.9%, from 60.74 MMSCFD in January 2019 to 106.9 MMSCFD in February 2019. Consequently, the total natural gas supplied increased from 1,882.82 MMSCF in January 2019 to 2,993.34 MMSCF in February 2019. The increase in the natural gas supplied by GNPC was to make up for the short falls in the natural gas that was to be supplied by GNGC. The share of natural gas from GNPC in the total fuel mix increased from 26.9% in January 2019 to 44.1% in February 2019. Also, in the total natural gas consumed, the share increased from 34.2% in January 2019 to 63.7% in February 2019.

Liquid Fuel

Liquid fuel consumption increased significantly in February 2019 by 41%, from 196,231 barrels in January 2019 to 276,936 barrels. The increased liquid fuel consumption was as a result of an increase in HFO consumption. The share of HFO in the total liquid fuel consumed increased from 93.9% in January 2019 to 98.9% in February 2019. In the total fuel mix, the share of HFO increased from 15.3% in January 2019 to 24.9% in February 2019. On the contrary, the share of LCO reduced from 6.1% in January 2019 to 1% in February 2019. In the total fuel mix, LCO's share reduced from 1% in January 2019 to 0.3% in February 2019. The total DFO consumed in February 2019 constituted 0.04% of the total liquid fuel consumed.

HIGHLIGHTS OF THE MONTH

Plant by Plant Highlights

Electricity Generation at the Akosombo Generation Station (GS) increased in February 2019

Average electricity generation from the Akosombo GS increased by 8.2%, from 17.81 GWh per day in January 2019 to 19.27 GWh per day in February 2019. On the contrary, the total electricity generated by the hydro power plant decreased by 2.3%, from 552.03 GWh in January 2019 to 539.43 GWh in February 2019. The total electricity supplied by the Akosombo GS reduced due to greater number of days in January than in February. The total electricity generated by the hydro power plant contributed 37.2% of the total electricity supplied and was significantly higher than the 340.6 GWh which was projected in the 2019 ESP by 58.4%. Akosombo GS contributed 837 MW to both the System Peak Load and the Ghana Peak Load, representing 31.1% of both Peak Loads.

Electricity supply by the Kpong Generation Station (GS) increased in February 2019

There was an increase of 5.6% in the average electricity generated by the Kpong GS, from 2.52 GWh per day in January 2019 to 2.66 GWh per day in February 2019. On the contrary, the total electricity supplied by the hydro power plant decreased by 4.6%, from 78.13 GWh in January 2019 to 74.51 GWh in February 2019. This was due to less number of days in February than in January. The total electricity supplied by Kpong GS constituted 5.1% of the total electricity supplied in February 2019 and was 22.2% higher than the 61 GWh projected in the 2019 ESP. The hydro power plant contributed 107 MW to the System Peak Load and the Ghana Peak Load, representing 4% of both Peak Loads in February 2019.

Electricity supply by the Bui Generation Station (GS) decreased in February 2019

The average electricity generated by the Bui GS reduced by 10.5% in February 2019, from 5.03 GWh per day in January 2019 to 4.5 GWh per day. Likewise, the total electricity generated by the hydro power plant decreased by 19.2%, from 156.03 GWh in January 2019 to 126.11 GWh in February 2019. The total electricity supplied by the hydro power plant constituted 8.7% of the total electricity supplied in February 2019 and was 1.5 folds higher than the 49.9 GWh projected in the 2019 ESP. Bui GS contributed 347.5 MW to both the System Peak Load and the Ghana Peak Load, representing 12.9% of both Peak Loads.

Generation by the Sunon Asogli Power Plant (SAPP) decreased in February 2019

The Sunon Asogli Power Plant (SAPP) recorded a reduction of 16% in the average electricity it generated in February 2019 of 4.49 GWh per day, from 5.34 GWh per day in January 2019. Similarly, the total electricity supplied by the thermal power plant reduced by 24.1%, from 165.59 GWh in January 2019 to 125.71 GWh in February 2019. The total electricity supplied by the power plant constituted 8.7% of the total electricity supplied in February 2019 and was 18.1% lower than the 153.5 GWh projected in the 2019 ESP. SAPP contributed 179.3 MW to the System Peak Load and the Ghana Peak Load, representing 6.7% of both Peak Loads. A total of 964.49 MMSCF of natural gas was consumed at an estimated heat rate of 8,190.1 Btu/kWh in February 2019, which was higher than the 8,060.25 Btu/kWh it recorded in January 2019.

Ameri Energy Power Plant's generation increased in February 2019

The Ameri power plant recorded an increase in its average electricity generated by 6.4%, from 5.09 GWh per day in January 2019 to 5.42 GWh per day in February 2019. On the contrary, the total electricity generated by the thermal power plant reduced by 3.9%, from 157.93 GWh in January 2019 to 151.73 GWh in February 2019. Ameri contributed 10.5% of the total electricity supplied in February 2019 and generated 9.1% more than the 139.1 GWh projected in the 2019 ESP. Ameri contributed 239.4 MW to the System Peak Load and the Ghana Peak Load, representing 8.9% of both Peak Loads in February 2019. The thermal power plant consumed a total of 1,517.5 MMSCF of natural gas at an estimated heat rate of 10,291.69 Btu/kWh in February 2019, which was lower than the 10,377.86 Btu/kWh it recorded in January 2019.

The Karpowership Power Plant's generation increased in February 2019

There was a significant increase of 1.1 folds in the average electricity supplied by the Karpowership, from 2.89 GWh per day in January 2019 to 6.15 GWh per day in February 2019. Similarly, the total electricity supplied by the thermal power plant increased by 91.9%, from 89.65 GWh in January 2019 to 172.05 GWh in February 2019. The total electricity generated by the thermal power plant constituted 11.9% of the total electricity supplied and was 25.8% lower than the 231.9 GWh projected in the 2019 ESP. Karpowership contributed 439.9 MW to both the System Peak Load and the Ghana Peak Load, representing 16.4% of both Peak Loads in February 2019. The thermal power plant consumed a total of 232,005.67 barrels of HFO at an estimated heat rate of 8,158.4 Btu/kWh in February 2019. The heat rate recorded was marginally higher than the 8,115.34 Btu/kWh it recorded in January 2019.

AKSA Power Plant's generation decreased in February 2019

The average electricity generated by the AKSA Power Plant decreased by 26.4%, from 1.49 GWh per day in January 2019 to 1.1 GWh per day in February 2019. The total electricity supplied by the thermal power plant decreased by 33.5%, from 46.31 GWh in January 2019 to 30.79 GWh in February 2019. AKSA's total electricity generated constituted 2.1% of the total electricity generated in February 2019 and was 45% lower than the 56 GWh projected in the 2019 ESP. The thermal power plant contributed 45.7 MW to both the System Peak Load and the Ghana Peak Load, representing 1.7% of both Peak Loads in February 2019. A total of 41,523.11 barrels of HFO was consumed by the thermal power plant at an estimated heat rate of 8,159.5 Btu/kWh in February 2019, which was marginally higher than the 8,150.76 Btu/kWh it recorded in January 2019.

Takoradi International Company (TICO) generation decreased in February 2019

There was a reduction in the average electricity generated by the TICO power plant by 38.6%, from 2.22 GWh per day in January 2019 to 1.36 GWh per day in February 2019. Similarly, the total electricity generated by the thermal power decreased by 44.6%, from 68.68 GWh in January 2019 to 38.08 GWh in February 2019. The total electricity generated by the thermal power plant contributed 2.6% of the total electricity supplied and was 79.2% lower than the 182.8 GWh projected in the 2019 ESP. TICO contributed 156 MW to the System Peak Load and the Ghana Peak Load, representing 5.8% of both Peak Loads in February 2019. A total of 330.58 MMSCF of natural gas was consumed at an estimated heat rate of 8,933.09 Btu/kWh in February 2019, which

HIGHLIGHTS OF THE MONTH

was lower than the 11,438.73 Btu/kWh in January 2019.

Takoradi Power Company (TAPCO) Plant's generation increased in February 2019

The average electricity generated by the TAPCO increased in February 2019 by 4.8%, from 4.03 GWh per day in January 2019 to 4.22 GWh per day. However, the total electricity of 118.18 GWh supplied by the thermal power plant in February 2019 was 5.4% lower than the 124.89 GWh it generated in January 2019. This was due to less number of days in February than in January. TAPCO's total electricity generation in February 2019 contributed 8.1% to the total electricity supplied and was 48.9% higher than the 79.4 GWh projected in the 2019 ESP. The thermal power plant contributed 210 MW to the System Peak Load and the Ghana Peak Load, representing 7.8% of both Peak Loads in February 2019. A total of 1,285.31 MMSCF of natural gas was consumed by the thermal power plant at an estimated heat rate of 11,190.87 Btu/kWh in February 2019, which was higher than the 11,088.36 Btu/kWh it recorded in January 2019.

Tema Thermal 1 Power Plant (TT1PP) operated in February 2019

TT1PP operated throughout February 2019 and generated an average of 0.73 GWh per day. The thermal power plant generated a total of 20.4 GWh in February 2019 which was 44.4% lower than the 36.7 GWh projected in the 2019 ESP. TT1PP contributed 107 MW to the System Peak Load and the Ghana Peak Load, representing 4% of both peak loads in February 2019. The thermal power plant consumed a total of 229.31 MMSCF of natural gas at an estimated heat rate of 12,000.21 Btu/kWh in February 2019.

Embedded Electricity Generation

Genser Power Plant's generation increased in February 2019

There was an increase in the average electricity generated by Genser by 12.1%, from 1.04 GWh per day in January 2019 to 1.17 GWh per day in February 2019. Similarly, the total electricity supplied by the thermal power plant increased by 1.2%, from 32.3 GWh in January 2019 to 32.7 GWh in February 2019. Genser's total electricity generated constituted 2.3% of the total electricity supplied in February 2019. The thermal power plant consumed a total of 8,836.95 tonnes of LPG at an estimated heat rate of 11,526.34 Btu/kWh in February 2019 which was higher than the 11,418.94 Btu/kWh in January 2019.

BXC's Solar generation decreased in February 2019

There was a reduction in the total electricity generated by the BXC solar power plant by 22.7%, from 1.8 GWh in January 2019 to 1.39 GWh in February 2019. The total electricity supplied by the solar power plant constituted 0.1% of the total electricity supplied in February 2019 and was 33.7% lower than the 2.1 GWh projected in the 2019 ESP.

VRA Navrongo Solar generation decreased in February 2019

The VRA Solar power plant recorded a reduction of 10% in the total electricity generated in February 2019, from 0.28 GWh in January 2019 to 0.25 GWh. The total electricity supplied by the solar power plant constituted 0.02% of the total electricity supplied in February 2019 and was 25% higher than the 25 GWh projected in the 2019 ESP.

Electricity Exchange – Both Import and Export increased in February 2019

Average electricity import from CIE increased by 17.65%, from 0.31 GWh per day in January 2019 to 0.36 GWh per day in February 2019. A total of 10.15 GWh was imported from CIE which was 6.3% higher than the 9.55 GWh in January 2019. Electricity import contributed 16 MW to both the System Peak Load and the Ghana Peak Load in February 2019.

There was also an increase in average electricity exported to CIE, CEB and SONABEL in February 2019 by 21.8%, from 2.62 GWh per day in January 2019 to 3.19 GWh per day. This was largely driven by a significant increase in average electricity exported to CEB, from 0.99 GWh per day in January 2019 to 1.71 GWh per day in February 2019. On the contrary, average electricity export to CIE and SONABEL reduced by 12.4% and 8.9%, from 0.25 GWh per day and 1.39 GWh per day in January 2019 to 0.22 GWh per day and 1.26 GWh per day in February 2019 respectively.

A total of 89.39 GWh of electricity was exported to CIE, CEB and SONABEL in February 2019 which was higher than the 81.28 GWh in January 2019. The total electricity exported to CEB increased by 56.6%, from 30.63 GWh in January 2019 to 47.96 GWh in February 2019. On the contrary, the total electricity exported to CIE and SONABEL reduced in February 2019 by 20.9% and 17.7%, from 7.67 GWh and 42.98 GWh in January 2019 to 6.07 GWh and 35.36 GWh respectively. The total electricity exported was 2.6% higher than the 61.3 GWh projected in the 2019 ESP.

Nevertheless, Ghana continued to be a net exporter of electricity in February 2019.

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

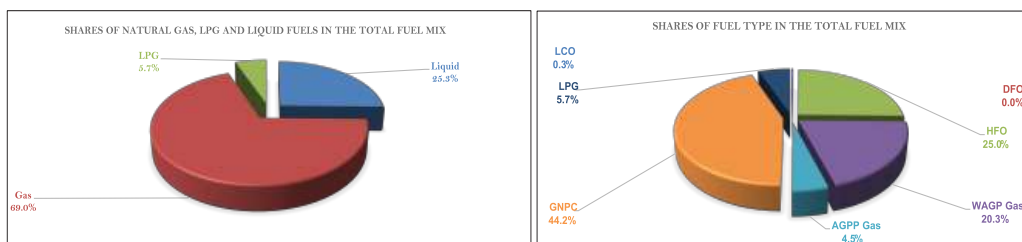


Figure 4a: Contribution of Natural Gas Supply by sources

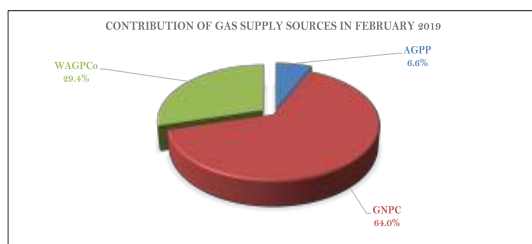
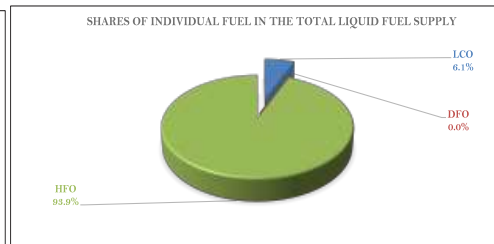


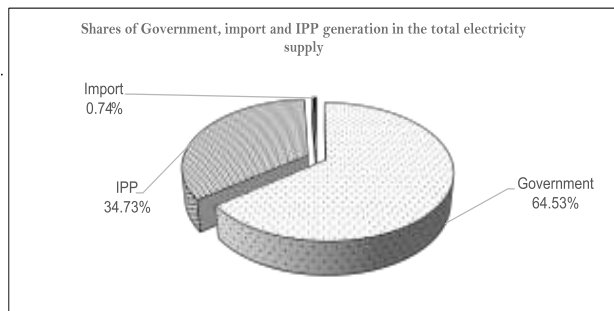
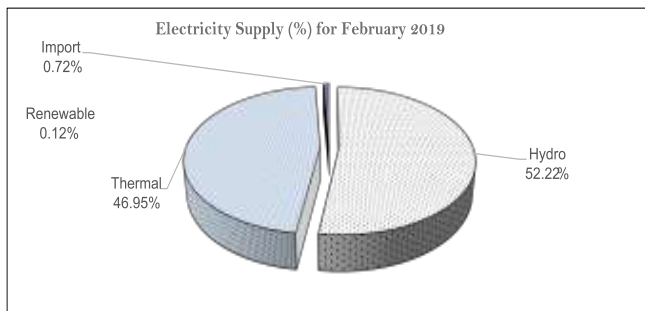
Figure 4b: Contribution of individual fuel in the liquid fuel supply



Peak Electricity Supply - February 2019			
Source of Supply	Generation at System Peak Load of February 2019 (MW)	Generation at Ghana Peak Load of February 2019 (MW)	Electricity Supply (GWh)
AKOSOMBO	837.00	837.00	539.43
KPONG	107.00	107.00	74.51
BUI	347.50	347.50	126.11
SEAP	179.30	179.30	125.71
TAPCO	210.00	210.00	118.18
TICO	156.00	156.00	38.08
TT1PP	107.00	107.00	20.40
CENT	-	-	-
TT2PP	6.40	6.40	6.82
MRP	-	-	-
KARPOWER	439.90	439.90	172.05
AMERI	239.40	239.40	151.83
KTPP	-	-	-
Trojan Power	-	-	-
CENPOWER	-	-	1.62
AKSA	45.70	45.70	30.79
BXC Solar	-	-	1.39
Safisana	-	-	-
VRA Solar	-	-	0.25
Genser	16.00	-	32.70
Meinergy	-	-	1.39
IMPORT	16.00	16.00	10.15
Export to CIE at peak	-	-	47.96
Export to CEB at peak	103.00	103.00	6.07
Export to Sonabel	65.00	65.00	35.36
System Coincident Peak Load	2,691.20		
Ghana Coincident Peak Load		2,523.20	
Total Supply			1,451.39
Total Supply without export			1,362.00

Ghana Electricity Demand & Supply		
		Feb-19
Maximum System Peak Load	MW	2,691.2
Minimum System Peak Load	MW	2,147.9
Average Peak Generation	MW	2,477.8
System Base Load	MW	1,543.8
Total Electricity	GWh	1,451.4
Load Factor (LF)	%	78.3

OPERATIONAL FACT SHEET



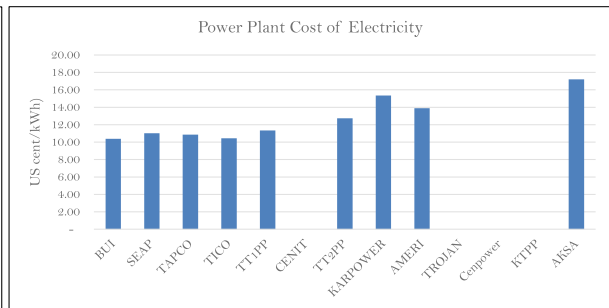
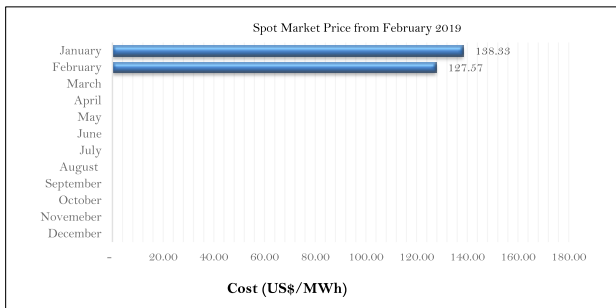
Power Plant Data for February 2019								
	Installed Capacity (MW)	Plant Capacity Utilization (%)	Electricity Generation (GWh)	Gas Consumption (MMBtu)	LCO Consumption (MMBtu)	DFO Consumption (MMBtu)	HFO Consumption (MMBtu)	LPG Consumption (MMBtu)
Akosombo	1,020.00	71.08	539.43	-	-	-	-	-
Kpong	160.00	62.59	74.51	-	-	-	-	-
Bui	400.00	42.38	126.11	-	-	-	-	-
SEAP	560.00	30.17	125.71	1,008,961.36	-	-	-	-
TAPCO	330.00	48.14	118.18	1,322,582.11	-	-	-	-
TICO	340.00	15.05	38.08	340,162.30	-	-	-	-
TT1PP	126.00	21.76	20.40	244,780.38	-	-	-	-
CENIT	126.00	-	-	-	-	-	-	-
TT2PP	49.50	18.50	6.82	89,985.26	-	-	-	-
KARPOWER	470.00	49.20	172.05	-	-	-	1,403,634.28	-
AMERI	250.00	81.63	151.83	1,556,352.48	-	-	-	-
Cenpower	350.00	0.62	1.62	-	17,448.70	589.93	-	-
TROJAN	56.00	-	-	-	-	-	-	-
KTPP	220.00	-	-	-	-	-	-	-
AKSA	360.00	11.49	30.79	-	-	-	251,214.83	-
GENSER	95.00	45.70	32.30	-	-	-	-	376,911.39
VRA Solar	2.50	14.93	0.28	-	-	-	-	-
BXC	20.00	12.10	1.80	-	-	-	-	-
Meinergy	20.00	9.00	1.34	-	-	-	-	-
Total	4,955.00	39.09	1,441.22	4,562,823.89	17,448.70	589.93	1,654,849.10	376,911.39

Average Monthly Flowrate (MMSCFD)	
Location	Monthly Average
Etoki	58.60
Tema WAGPCo	47.35
Aboadze WAGPCo	0.00
Aboadze GNGC	117.30

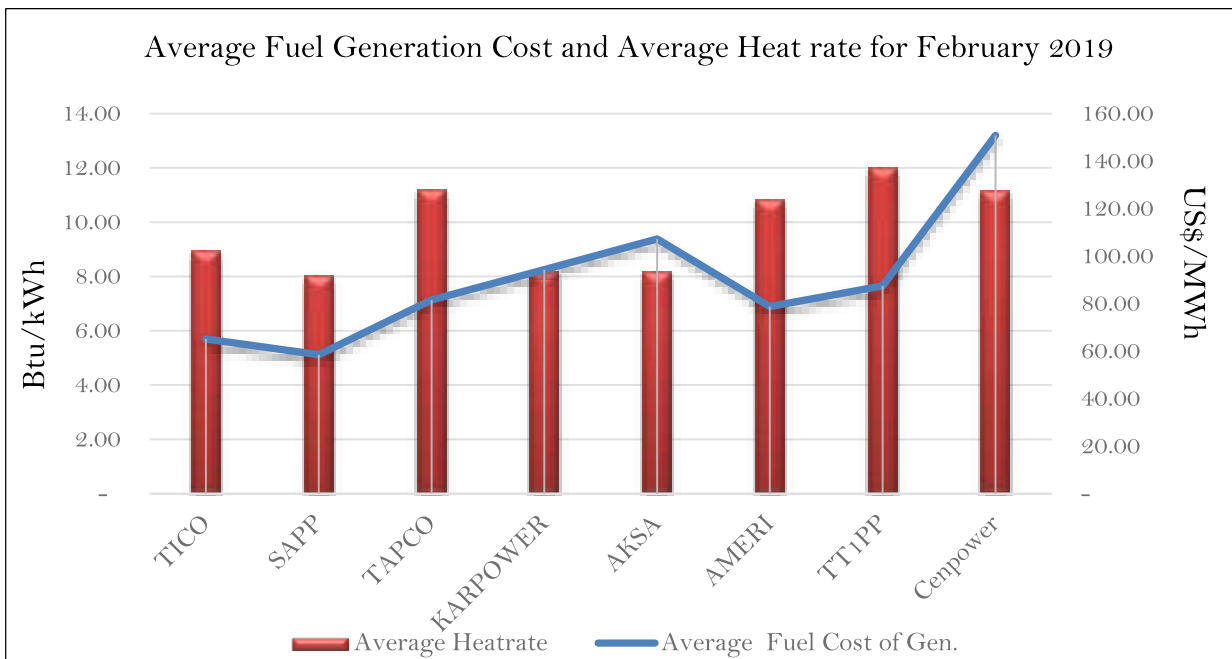
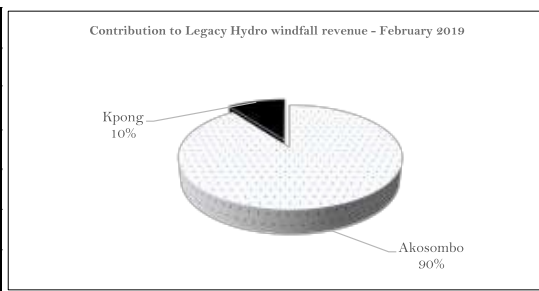
Feb-19			
	Beginning month (ft)	End month (ft)	Change in water level
Hydro Dam			(feet)
Akosombo	260.00	258.18	-1.82
Bui	572.83	565.31	-7.51

ECONOMIC FACT SHEET

		Feb-19	Jan-19	Change
Average Market Energy Cost	US\$/MWh	103.73	104.27	(0.54)
Average Market Capacity Charge (AMCC)	US\$/MWh	38.84	37.12	1.72
Total Average Market Cost (TAC)	US\$/MWh	142.57	141.39	1.18
System Marginal Cost (SMC)	US\$/MWh	127.13	138.33	(11.21)
System Marginal Capacity Charge (SMCC)	US\$/MWh	33.54	31.89	1.65
Spot Market Price (SMP)	US\$/MWh	160.67	170.22	(9.55)
Composite Bulk Generation Charge (CBGC)	US\$/MWh	97.01	97.01	-
Deviation of TAC from CBGC	US\$/MWh	(45.56)	(44.38)	(1.18)
Deviation of SMP from CBGC	US\$/MWh	(63.66)	(73.21)	9.55

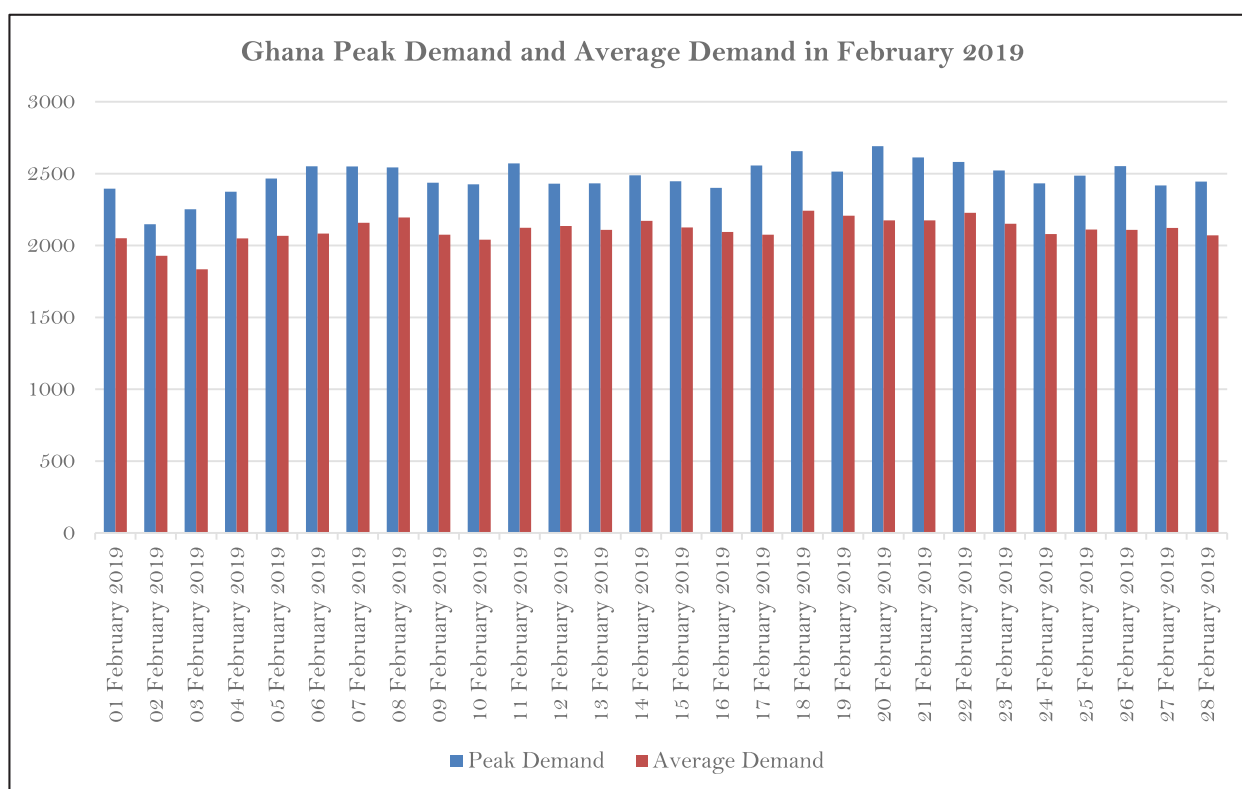


Average Fuel Prices		
		Feb-19
Fuel Type	Unit	Delivered Cost
Natural Gas	US\$/MMBtu	7.29
LCO	US\$/BBL	73.96
HFO	US\$/Tonne	397.60
DFO	US\$/Tonne	709.99



ECONOMIC FACT SHEET

Power Plant	Average Heat rate (Btu/kWh)	Average Fuel Cost of Generation (US\$/MWh)	Emission Factor (kgCO ₂ /kWh)
SAPP	8,026.30	58.51	0.43
TAPCO	11,190.87	81.58	0.59
TICO	8,933.09	65.12	0.47
TT1PP	12,000.21	87.48	0.64
CENIT	-	-	-
TT2PP	13,204.00	96.26	0.70
KARPOWER	8,158.40	94.32	0.64
AMERI	10,250.90	74.73	0.54
TROJAN	-	-	-
KTPP	-	-	-
AKSA	8,159.50	107.23	0.64
Genser	11,526.34		0.71



Other Market News and Trends

1.0 Market Prices Projections for 2019

The Electricity Market Oversight Panel has since January 2019 published the projected Spot Market Prices (SMP) and Average Market Prices (AMP) modelled based on the 2019 Electricity Supply Plan (ESP) developed by the Ghana Grid Company Limited (GRIDCo). The SMP is calculated based on article 4.1.4 of the rate setting guidelines of the Public Utilities Regulatory Commission (PURC). The projected SMP and AMP for 2019 are aimed at providing market price information to both utilities and potential investors.

This bulletin and its subsequent editions would compare the projected and actual SMP and AMP and provide details of significant deviations.

Projected fuel prices are shown in table 1.0. Natural gas price is as gazette by the PURC. Liquid fuel prices (LCO and HFO) are the Freight on Board (FOB) prices.

Table1.0

	Natural gas	LCO	HFO
US\$/MMBtu	7.29	14.12	10.97

The AMPs as shown in table 1.2, are projected to range between \$114.43/kWh to \$129.68/kWh in 2019. The variations in the AMP in the year are largely due to the expected switch from Heavy Fuel Oil (HFO) by Karpowership to Natural Gas (NG) in the third quarter of 2019 when the power plant is projected to be relocated to the West (Takoradi). The Average Market Energy Cost (AMEC) is also projected to range between \$82.32/MWh to \$91.69/MWh.

Table 1.2 shows the projected monthly AMP and SMP for 2019.

	Projected Market Prices (US\$/MWh)											
	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19
Average Market Marginal Cost (AMEC)	91.69	90.56	90.97	93.55	92.82	91.00	91.06	83.74	79.81	84.15	84.13	82.32
Average Market Capacity Charge (AMCC)	36.17	36.29	36.42	36.13	35.73	36.01	36.33	31.67	34.62	34.73	34.99	33.96
Total Average Market Price (AMP)	127.86	126.85	127.39	129.68	128.54	127.01	127.40	115.40	114.43	118.88	119.12	116.28
Short Run Marginal Cost (SRMC)	104.88	104.88	104.88	104.88	104.88	104.88	104.88	88.55	88.55	88.55	88.55	88.55
Short Run Marginal Capacity Charge (SRMCC)	23.42	25.11	23.42	23.95	23.42	23.95	23.42	23.42	23.95	23.42	23.95	23.42
Spot Market Price (SMP)	128.31	129.99	128.31	128.83	128.31	128.83	128.31	111.97	112.50	111.97	112.50	111.97

The Spot Market Price (SMP) is particularly important as it provides the price of electricity to be purchased by Utilities and Bulk Customers (BC) to make up for deficits in supply from their contracted capacity. It also provides prices for the Akosombo GS and Kpong GS.

The monthly SMPs for 2019 are projected to range between \$111.97/MWh and \$129.99/MWh. This implies that any market participant who wishes to trade on the spot market to make up for deficit in supply from contracted capacities will pay these prices. Electricity supplied by the Akosombo GS and Kpong GS would also cost between \$111.97/MWh and \$129.99/MWh.

At the real time dispatch, AMP and SMP could vary due to factors such as fuel availability, technical challenges to power plants, changes in demand, congestion, hydro water levels and changes in prices of fuel for thermal generation.

Comparing to the actual AMP in January 2019 and February 2019 to the projected AMPs, the actual AMPs were US\$13.53/MWh and US\$16.15/MWh respectively and these were higher than projected. Similarly, comparing the actual SMP in January 2019 and February 2019 to the projected, the actual SMPs were US\$41.91/MWh and US\$30.68/MWh respectively and which were higher than projected. The higher cost of AMP and SMP were due to the unavailability of certain thermal power plant projected to be online which necessitated the coming online of more expensive thermal power plants in January and February.

2.0 Hydro Generation increases significantly in 2019 as electricity Supply increases

Electricity supply in January 2019 and February 2019 increased by 20% and 19.3% respectively compared to the electricity supplied in the same months in 2018. Likewise, the electricity supplied in January 2019 and February 2019 was 3.5% and 8.7% respectively higher than projected in the 2019 Electricity Supply Plan (ESP). Electricity supply has also increased from an average of 46.99 GWh per day in December 2018 and 49.58 GWh per day in January 2019 to 51.84 GWh per day in February 2019.

Other Market News and Trends

The growth in supply was predominately due to the increase in consumption of the Distribution Utilities and export. Electricity consumption by the Distribution Utilities grew by 12.3% in January 2019 and 9.8% in February 2019 compared to the electricity consumption in January 2018 and February 2018. Compared to the 2019 ESP, electricity consumption by the utilities were 3.6% and 8% higher than projected for January 2019 and February 2019 respectively. Electricity Consumption by the utilities have increased from 35.73 GWh per day in December 2018 to 36.9 GWh per day in January 2019 and 38.16 GWh per day in February 2019.

Similarly, electricity export grew by 3.2 folds in January 2019 to 81.28 GWh, from 19.57 GWh in January 2018. Also, the total electricity export in February 2019 increased by 2.9 folds to 89.39 GWh, from 23.05 GWh in February 2018. The significant increase in the total electricity export was due to supply to SONABEL from the National Interconnected Transmission System (NITS). Electricity export increased from 2.62 GWh per day in January 2019 to 3.19 GWh per day in February 2019. Electricity export was also 20.2% and 45.3% higher than projected in the 2019 ESP for January and February respectively.

The increase in electricity demand in January 2019 and February 2019 necessitated an increase in the total electricity supplied within the period. The increase in the total electricity supplied was met due to an increase in generation from hydro power plants as fuel supply challenges limited the generation from thermal power plants. Hydro power plants accounted for 51.5% and 51% of the total electricity supplied in January 2019 and February 2019 respectively compared to the projected 33.5% and 33.8% in January and February in the 2019 ESP.

The Akosombo GS and Kpong GS accounted for 41% and 42.3% of the total electricity supplied in January 2019 and February 2019 respectively. Average generation from the Akosombo GS and Kpong GS was 41.6% higher than projected for January in the 2019 ESP. Similarly, the total electricity generation from the Akosombo and Kpong GS was 52.9% higher than projected in the 2019 ESP. At the current rate of generation of 21.13 GWh per day, supply from Akosombo GS and Kpong GS would be 7,712.5 GWh by the end of 2019 which is significantly higher than the projected 5,070 GWh in the 2019 ESP.

The inability of thermal power plants to supply as projected has largely been due to fuel supply challenges. Natural gas supply from the WAGPCo to power plants in Tema and Kpone for January 2019 and February 2019 was lower than projected. Against a projected natural gas demand of 74 MMSCFD (based on projected generation in the 2019 ESP), in January 2019, natural gas supply averaged 56 MMSCFD and 47 MMSCFD in February 2019. This limited the generation from power plants such as Sunon Asogli Power Plant (SAPP), Tema Thermal 1 Power Plant (TT1PP) and Kpone Thermal Power Plant (KTPP). These three power plants generated 12.9% lower than the 357.24 GWh projected in the 2019 ESP for January 2019 and February 2019.

HFO supply challenges also limited electricity generation from the ASKA Power Plant and the Karpowership in January 2019 and February 2019. These two power plants generated 87.4% lower than the 634.6 GWh projected under the 2019 ESP for January 2019 and February 2019.

Technical challenges to the TICO power plant limited generation from the plant. The TICO had 100 MW available as against the projected 320 MW. Electricity supplied by TICO Power Plant was therefore 2.1 folds lower than the projected due to the technical unavailability of some of its units.

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>Gh¢ = 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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Actions, we can all take.
Not only will you be
saving money for
yourself, but these
habits are Acts of
Citizenship and
Common Humanity"...

H. E. President
Nana Addo Dankwah Akufo Addo
(Thursday 27th April, 2017)