



# GHANA WHOLESALE ELECTRICITY MARKET BULLETIN

## MARKET WATCH

### Monthly Market Data Analysis

ISSUE NO. 57

1<sup>st</sup> September 2020 to 30<sup>th</sup> September 2020

This Bulletin covers major developments in the Wholesale Electricity Market (WEM) of Ghana from 1<sup>st</sup> September, 2020 to 30<sup>th</sup> September, 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.

The Electricity Market Oversight Panel (EMOP) would very much appreciate and welcome comments from readers on the Bulletin. Reasonable care has been taken to ensure the information contained in this Bulletin is accurate at the time of publication, nevertheless, any errors, omissions or inaccuracies therein are regretted.

#### HIGHLIGHTS OF THE MONTH

There was a marginal increase in the System Peak Load for September 2020 by 1.5%, from 2,637.4 MW in August 2020 to 2,676.7 MW. On the contrary, the System Peak Load recorded in September 2020 was 6.8% lower than the 2,872 MW projected in the 2020 ESP. At the System Peak Load for September 2020, a total of 220 MW was exported to our neighbouring countries namely, CIE, CEB and SONABLE. The Ghana Peak Load of 2,489.4 MW in September 2020 was 2% higher than the 2,440.33 MW in August 2020. However, the Ghana Peak Load recorded in September 2020 was 2.5% lower than the 2,552 MW projected in the 2020 ESP. The average electricity demand of 2,122.69 MW recorded for September 2020 was 0.1% lower than the 2,123.84 MW in August 2020.

In September 2020, the average electricity supplied decreased marginally by 0.1%, from 50.97 GWh per day in August 2020 to 50.93 GWh per day. Similarly, the total electricity of 1,527.9 GWh supplied in September 2020 was 3.3% lower than the 1,580.13 GWh in August 2020. The electricity of 7.53 GWh imported from CIE constituted 0.5% of the total electricity supplied in September 2020, while the remaining 1,520.32 GWh was supplied from domestic sources. A total of 87.58 GWh of electricity was supplied to CIE, CEB and SONABEL in September 2020.

The total electricity generated by the hydroelectric power plants constituted 39.1% of the total electricity supplied in September 2020, while electricity generated from thermal sources constituted 59.3%. The electricity generated from renewable sources continued to account for 0.3% of the total electricity supply.

Table 1. Projected and Actual Outturn of electricity demand and supply in August 2020 and September 2020.

|                                  | August 2020 |                | September 2020 |                |
|----------------------------------|-------------|----------------|----------------|----------------|
|                                  | Projected   | Actual Outturn | Projected      | Actual Outturn |
| Total Supply (GWh)               | 1,537.3     | 1,580.1        | 1,540.2        | 1,527.9        |
| Source by Power Plants (GWh)     |             |                |                |                |
| AKOSOMBO                         | 375.0       | 369.3          | 363.0          | 400.3          |
| KPONG                            | 68.0        | 69.9           | 65.0           | 73.4           |
| BUI                              | 39.0        | 108.8          | 41.0           | 128.9          |
| Sunon Asogli                     | 273.0       | 353.4          | 268.0          | 304.2          |
| TAPCO                            | 89.0        | 92.3           | 102.0          | 12.3           |
| TICO                             | 98.0        | 17.8           | 91.0           | 70.3           |
| TF1PP                            | -           | 41.9           | -              | 6.0            |
| CENIT                            | -           | 76.8           | -              | 60.8           |
| TF2PP                            | -           | 7.6            | -              | 12.9           |
| Amandi                           | 99.0        | 3.5            | 96.0           | 40.8           |
| Karpowership                     | 268.0       | 260.2          | 259.0          | 229.1          |
| AMERI                            | 124.0       | 73.8           | 75.0           | 50.8           |
| RTPP                             | -           | 35.8           | -              | 67.6           |
| Trojan Power                     | -           | -              | -              | -              |
| CENPOWER                         | 120.0       | -              | 116.0          | -              |
| AKSA                             | -           | 16.9           | -              | 21.7           |
| Bridge Power                     | -           | -              | -              | -              |
| BXC Solar                        | 2.0         | 2.2            | 2.0            | 2.0            |
| Safisana                         | -           | -              | -              | -              |
| VRA Solar                        | 0.3         | 0.2            | 0.2            | 0.2            |
| Genser                           | -           | 38.5           | -              | 37.1           |
| Meinergy                         | 2.0         | 2.4            | 2.0            | 1.8            |
| Total Generation (GWh)           | 1,537.3     | 1,571.4        | 1,540.2        | 1,520.3        |
| Imports (GWh)                    | -           | 8.7            | -              | 7.5            |
| Total Supply (GWh)               | 1,537.3     | 1,580.1        | 1,540.2        | 1,527.9        |
| Deficit/Over supply (GWh)        | -           | 22.8           | -              | (12.3)         |
| Ghana Coincident Peak Load (MW)  | 2,574.0     | 2,440.3        | 2,574.0        | 2,489.4        |
| System Coincident Peak Load (MW) | 2,894.0     | 2,637.4        | 2,894.0        | 2,676.7        |

## HIGHLIGHTS OF THE MONTH

The rate of increase in the water level for the Akosombo GS increased by 7.3%, from 0.022 feet per day in August 2020 to 0.183 feet per day in September 2020. Also, the Bui GS began to record a net increase in the water level in September 2020 at a rate of 0.15 feet per day.

The share of the total natural gas consumed in the total fuel mix in September 2020 reduced from 98.5% in August 2020 to 97.9%. This was as a result of an increase in the electricity generation from the AKSA power plant. Consequently, the share of the total liquid fuel consumed increased from 1.5% in August 2020 to 2.1% in September 2020.

### ELECTRICITY DEMAND AND SUPPLY

#### Electricity Demand

In September 2020, the System Peak Load of 2,676.7 MW recorded was 1.5% higher than the 2,637.4 MW recorded in August 2020. On the contrary, the System Peak Load recorded in September 2020 was 6.8% lower than the 2,872 MW in the 2020 ESP. A total of 220 MW of electricity was exported at the System Peak Load in September 2020. Additionally, there was no electricity import from CIE at the System Peak Load for the month. The total electricity generated from hydro sources contributed 49.1% of the System Peak Load, whilst thermal generation sources accounted for the rest. The Ghana Peak Load in September 2020 also increased by 2%, from 2,440.33 MW in August 2020 to 2,489.4 MW. There was a marginal reduction in the average electricity demand in September 2020 by 0.8%, from 2,123.84 MW in August 2020 to 2,122.39 MW. Consequently, the System Load Factor reduced from 78.32% in August 2020 to 77.1% in September 2020.

#### Electricity supply

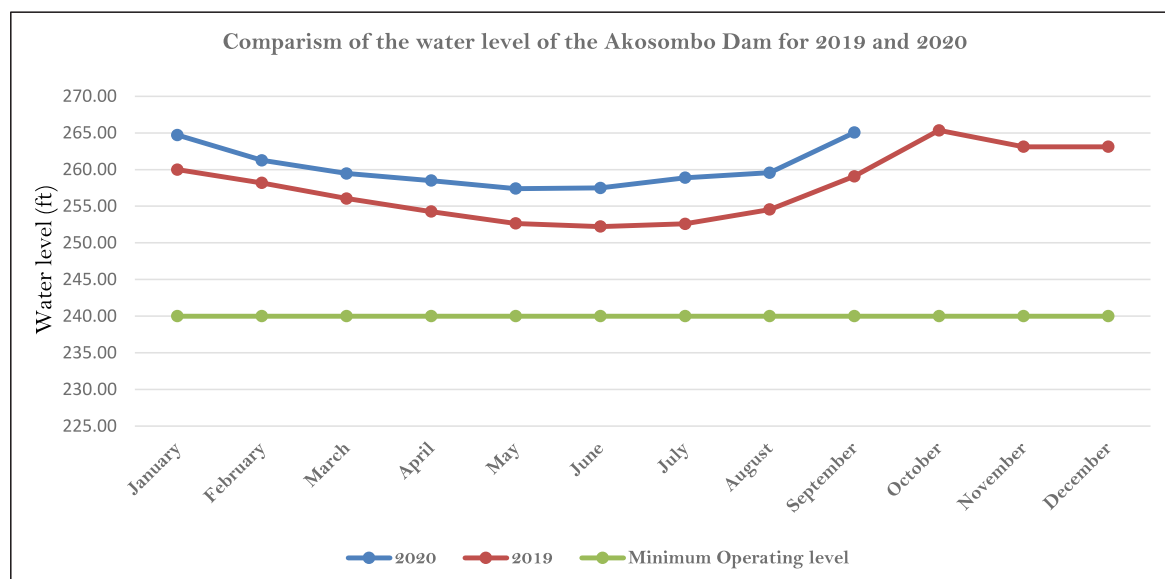
The average electricity supplied in September 2020 reduced marginally by 0.1%, from 50.97 GWh per day in August 2020 to 50.93 GWh per day. As a result of the reduction in the average electricity supplied in September 2020, the total electricity supplied reduced by 3.2%, from 1,580.13 GWh in August 2020 to 1,527.9 GWh. The total electricity supplied in September 2020 was 0.8% lower than the 1,540.2 GWh projected in the 2020 ESP. Out of the total electricity supplied 7.53 GWh of electricity was imported from CIE and the remaining 1,520.32 GWh was supplied from domestic sources. A total of 87.58 GWh was exported to CIE, CEB and SONABEL in the proportion of 1.96 GWh, 29.59 GWh and 56.03 GWh respectively in September 2020. The total electricity supplied to Distribution Companies and Bulk Customers reduced marginally by 1.9%, from 1,468.58 in August 2020 to 1,440.27 GWh in September 2020. The contribution of the electricity generated from thermal sources was 59.3%, while the generation from hydroelectric sources was 39.1% and solar power generation was 0.3%.

### HYDRO DAM LEVELS

#### Akosombo Dam Water Level continued to increase in September 2020

The water level for the Akosombo GS continued to increase in September 2020, from 0.022 feet per day in August 2020 to 0.183 feet per day. The water level for the Akosombo GS at the beginning of the month was 259.57 feet which rose by 5.48 feet to a month end water level of 265.05 feet. At the end of the month, the water level recorded was 5.98 feet above the water level recorded for the same period in 2019 and was 12.95 feet below the maximum operating level of the dam.

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



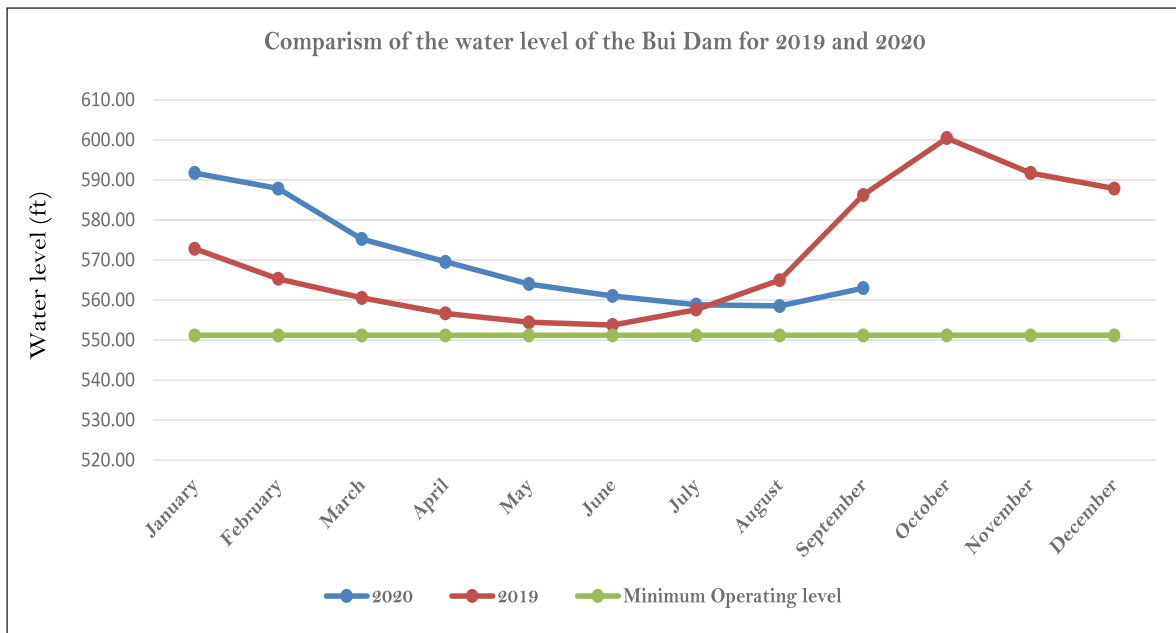
## HIGHLIGHTS OF THE MONTH

### Bui Dam Water Level began to increase in September 2020

The water level for the Bui GS began to increase in September 2020 at the rate of 0.15 feet per day. The water level of 558.5 feet recorded at the beginning of the month increased by 4.49 feet to 562.99 feet at the end of the month. The month-end water level recorded was 23.29 feet above the water level recorded for the same period in 2019 and was 37.4 feet below the maximum operating level of the dam.

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

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



## FUEL SUPPLY FOR POWER GENERATION

### Natural gas imports from the West Africa Gas Pipeline Company (WAPCo) increased in September 2020

The average natural gas imported from Nigeria through the West African Gas Pipeline (WAGP) increased marginally by 0.9%, from 58 MMSCFD in August 2020 to 58.57 MMSCFD in September 2020. On the contrary, the total natural gas supplied by WAPCo decreased from 1,801.77 MMSCF in August 2020 to 1,756.98 MMSCF in September 2020. The total natural gas supplied by WAPCo constituted 23.7% of the total natural gas consumed in September 2020 which was higher than the 22.2% recorded in August 2020. In the total fuel mix, the share of the natural gas supplied by WAPCo increased from 21.8% in August 2020 to 23.2% in September 2020.

### Natural gas supply from domestic sources decreased in September 2020

An average of 185.94 MMSCFD of natural gas was supplied from domestic sources in September 2020, this was however 8.2% lower than the 202.48 MMSCFD recorded in August 2020. Consequently, the total natural gas supplied decreased from 6,276.76 MMSCF in August 2020 to 5,578.1 MMSCF in September 2020. The natural gas supplied from the domestic gas fields constituted 76.3% of the total natural gas consumed in September 2020 which was lower than the 77.9% recorded in August 2020. Similarly, the share of the natural gas supplied from domestic sources in the total fuel mix decreased from 76.7% in August 2020 to 74.7% in September 2020.

### Liquid Fuel consumption increased in September 2020

The consumption of liquid fuel continued to increase steadily from 18,685 barrels in July, 23,077 barrels in August 2020 to 29,431 barrels in September 2020. The increase in liquid fuel consumption was due to increased generation from AKSA in September 2020. The share of the total liquid fuel consumed increased from 1.5% in August 2020 to 2.1% in September 2020. The Heavy Fuel Oil (HFO) continued to be the only liquid fuel consumed in September 2020.

## HIGHLIGHTS OF THE MONTH

### Plant by Plant Highlights

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

The Akosombo GS recorded an increase in the average electricity supplied in September 2020 by 12%, from 11.91 GWh per day in August 2020 to 13.34 GWh per day. Consequently, the total electricity supplied by the Akosombo GS increased from 369.29 GWh in August 2020 to 400.27 GWh in September 2020. The Akosombo GS' total supply in September 2020 was 10.3% higher than the 363 GWh projected in the 2020 ESP and constituted 26% of the total electricity supplied in September 2020. The hydroelectric power plant generated 894.8 MW to the System Peak Load, representing 33.4% in September 2020.

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

An average of 2.45 GWh per day of electricity was supplied by the Kpong GS in September 2020 which was 8.6% higher than the 2.25 GWh per day in August 2020. Similarly, the total electricity supplied by the hydroelectric power plant increased from 69.85 GWh in August 2020 to 73.44 GWh in September 2020. The total electricity supplied by the Kpong GS constituted 4.8% of the total electricity supplied in September 2020 and was 13% higher than the 65 GWh projected in the 2020 ESP. The Kpong GS supplied a total of 113 MW to the System Peak Load, which translates into 4.2% in September 2020.

#### Electricity supply by the Bui Generation Station (GS) increased in September 2020.

The Bui GS continued to record an increase in the average electricity supply despite a slow increase in the water level from 3 GWh per day in July 2020, 3.51 GWh per day in August 2020 to 4.3 GWh per day in September 2020. The total electricity supplied by the hydroelectric power plant increased in a similar fashion from 108.82 GWh in August 2020 to 128.93 GWh in September 2020. The Bui GS' total electricity supplied in September constituted 8.4% of the total electricity supplied and was over two folds higher than the 41 GWh projected in the 2020 ESP. The Bui GS contributed 11.4% of the System Peak Load, translating into 305.4 MW in September 2020.

#### The Sunon Asogli Power Plant (SAPP) decreased generation in September 2020

The average electricity supplied by the SAPP decreased in September 2020 by 11.1%, from 13.5 GWh per day in August 2020 to 10.14 GWh per day. Similarly, the total electricity supplied by SAPP decreased by 13.9%, from 353.38 GWh in August 2020 to 304.19 GWh in September 2020. The total electricity supplied by the thermal power plant constituted 19.8% of the total electricity supplied in September 2020 and was 13.5% higher than the 268 GWh projected in the 2020 ESP. The thermal power plant supplied 536.9 MW to the System Peak Load in September 2020. The total electricity supplied by SAPP at the System Peak Load represents 20.1% of the peak load. A total of 2,178.83 MMSCF of natural gas was consumed by the thermal power plant at an estimated heat rate of 7,934.66 Btu/kWh in September 2020 which was higher than the 7,868.98 Btu/kWh recorded in August 2020.

#### Ameri Energy Power Plant's generation decreased in September 2020

The average electricity supplied by the Ameri power plant reduced by 28.5%, from 2.38 GWh per day in August 2020 to 1.7 GWh per day in September 2020. The total electricity supplied by the Ameri power plant in September 2020 was 51.07 GWh which was lower than the 73.85 GWh in August 2020 by 30.9%. The total electricity supplied by the thermal power plant in September 2020 constituted 3.3% of the total electricity supplied and was 31.9% lower than the 75 GWh projected in the 2020 ESP. A total of 49.6 MW was supplied by the thermal power plant to the System Peak Load, representing 1.9% in September 2020. The Ameri power plant consumed 473.49 MMSCF of natural gas at an estimated heat rate of 10,271.06 Btu/kWh in September 2020. The heat rate recorded in September 2020 was lower than the 10,499 Btu/kWh recorded in August 2020.

#### The Karpowership Power Plant's generation decreased in September 2020

The Karpowership recorded a reduction of 9% in the average electricity supplied in September 2020, from 8.39 GWh per day in August 2020 to 7.64 GWh per day. The total electricity supplied by the power barge decreased from 260.22 GWh in August 2020 to 229.09 GWh in September 2020. Karpowership's total electricity supplied in September 2020 constituted 14.9% of the total electricity supplied and was 11.6% lower than the 259 GWh projected in the 2020 ESP. The thermal power plant contributed 15.8% of the System Peak Load, translating into 424 MW in September 2020. The Karpowership consumed a total of 1,667.59 MMSCF of natural gas at an estimated heat rate of 8,063.59 Btu/kWh in September 2020 which was higher than the 7,938.93 Btu/kWh recorded in August 2020.

#### AKSA Power Plant's generation increased in September 2020

The average electricity supplied by the AKSA power plant increased in September 2020 by 32.9%, from 0.54 GWh per day in August 2020 to 0.72 GWh per day. Consequently, the total electricity supplied by the thermal power plant increased by 28.6%, from 16.89 GWh in August 2020 to 21.72 GWh in September 2020. The total electricity supplied by the thermal power plant constituted 1.4% of the total electricity supplied in September 2020. The AKSA power plant was projected to be offline in September 2020. AKSA contributed 15.8 MW to the System Peak Load in September 2020, which represent 0.6% of the peak load. A total of 29,430 barrels of HFO was consumed at an estimated heat rate of 8,197.44 Btu/kWh in September 2020. The heat rate recorded by AKSA in September 2020 was lower than the 8,216.51 Btu/kWh recorded in August 2020.

#### Takoradi International Company (TICO) generation increased in September 2020

The TICO power plant recorded a significant increase in the average electricity supplied by over three folds from 0.58 GWh per day in August 2020 to 2.34 GWh per day in September 2020. The total electricity of 70.3 GWh supplied by the TICO power plant was higher than the 17.84 GWh supplied in August 2020. The total electricity supplied by the thermal power plant constituted 4.6% of the total electricity supplied in September 2020 and was 22.8% lower than the 91 GWh projected in the 2020 ESP. The thermal power plant generated 215 MW to the System Peak Load, representing 8% in September 2020. TICO consumed a total of 731.39 MMSCF of natural gas at an estimated heat rate of 11,525.17 Btu/kWh in September 2020 which was higher than the 9,861.73 Btu/kWh recorded in August 2020.

## HIGHLIGHTS OF THE MONTH

### **Takoradi Power Company (TAPCo) Plant's generation was limited in September 2020**

The operation of the TAPCo power plant was limited to 13 days in September 2020 due to technical challenges. The thermal power plant supplied a total of 12.33 GWh which was 92.4% lower than the 162 GWh projected in the 2020 ESP. The total electricity supplied by TAPCo constituted 0.8% of the total electricity supplied in September 2020. The thermal power plant did not contribute to the System Peak Load in September 2020. A total of 105.3 MMSCF of natural gas was consumed by the thermal power plant at an estimated heat rate of 9,461.07 Btu/kWh.

### **CENIT Power Plant decreased its generation in September 2020.**

The average electricity supplied by the CENIT power plant decreased by 18.3% from 2.48 GWh per day in August 2020 to 2.03 GWh in September 2020. Similarly, the power plant's total electricity supplied in September 2020 decreased from 76.84 GWh in August 2020 to 60.77 GWh. The total electricity supplied by the thermal power plant constituted 4% of the total electricity supplied in September 2020. The thermal power plant was projected to be offline in September 2020 and did not contribute to the System Peak Load. A total of 629.79 MMSCF of natural gas was consumed by the thermal power plant at an estimated heat rate of 11,481.33 Btu/kWh in September 2020 which was higher than the 11,468.12 Btu/kWh recorded in August 2020.

### **Kpone Thermal Power Plant's (KTPP) generation increased in September 2020**

The KTPP recorded an increase in the total electricity supplied by 89%, from 35.8 GWh in August 2020 to 67.64 GWh in September 2020. The total electricity supplied by KTPP constituted 4.4% of the total electricity supplied in September 2020. The thermal power plant was projected to be offline in September 2020. The power plant supplied 104 MW at the System Peak Load in September 2020, which formed 3.9% of the peak load. KTPP consumed a total of 680.32 MMSCF of natural gas at an estimated heat rate of 11,142.43 Btu/kWh in September 2020 which was higher than the 11,105.15 Btu/kWh in August 2020.

## **Embedded Electricity Generation**

### **Genser Power Plant's generation decreased in September 2020**

The Genser power plant recorded a marginal reduction of 0.3% in the average electricity supplied from 1.24 GWh per day in August 2020 to 1.23 GWh per day in September 2020. Similarly, the total electricity supplied by the embedded thermal power plant decreased from 38.46 GWh in August 2020 to 37.11 GWh in September 2020. Genser's total electricity supply for September 2020 constituted 2.4% of the total electricity supplied. The thermal power plant consumed a total of 423.16 MMSCF of natural gas at an estimated heat rate of 12,925.06 Btu/kWh in September 2020. The heat rate recorded in September 2020 was higher than the 11,335.62 Btu/kWh recorded in August 2020.

### **BXC Solar generation decreased in September 2020**

The total electricity supplied by the BXC solar power plant decreased by 9.9%, from 2.23 GWh in August 2020 to 2.01 GWh in September 2020. The total electricity supplied by BXC constituted 0.1% of the total electricity supplied in September 2020 and was 0.3% higher than the 2 GWh in the 2020 ESP.

### **Meinergy Solar generation decreased in September 2020**

The Meinergy solar power plant recorded a reduction in the total electricity supplied in September 2020 by 24.9%, from 2.42 GWh in August 2020 to 1.81 GWh. Meinergy's total electricity supply for September 2020 contributed 0.1% of the total electricity supplied and was 9.3% lower than the 2 GWh projected in the 2020 ESP.

### **VRA Navrongo Solar generation decreased in September 2020**

The VRA Navrongo solar recorded a decrease in the electricity supplied by 2.2%, from 0.23 GWh in August 2020 to 0.22 GWh in September 2020. The solar power plant supplied 12% higher than the 0.2 GWh projected in the 2020 ESP and constituted 0.01% of the total electricity supplied in September 2020.

## **Electricity Exchange – Import increased while Export decreased in July 2020**

The average electricity imported from CIE in September 2020 decreased by 10.8%, from 0.28 GWh per day in August 2020 to 0.25 GWh per day. Similarly, the electricity imported from CIE decreased from 8.72 GWh in August 2020 to 7.53 GWh in September 2020. The electricity imported in September 2020 constituted 0.5% of the total electricity supplied in September 2020.

On average the electricity export to our neighbouring countries decreased by 18.9% from 3.6 GWh per day in August 2020 to 2.92 GWh per day in September 2020. The average electricity exported to CIE and CEB decreased from 0.16 GWh per day and 2.53 GWh per day in August 2020 to 0.07 GWh per day and 1.87 GWh per day in September 2020 respectively. On the contrary, the average electricity exported to CEB increased from 0.91 GWh per day in August 2020 to 0.99 GWh per day in September 2020.

A total of 87.58 GWh of electricity was exported to CEB, CIE and SONABEL in September 2020 which was 21.5% lower than the 111.55 GWh recorded in August 2020. The total electricity supplied to CIE and SONABEL decreased from 4.93 GWh and 78.49 GWh in August 2020 to 1.96 GWh and 56.03 GWh in September 2020 respectively. The total electricity supplied to CEB increased from 28.13 GWh in August 2020 to 29.59 GWh in September 2020.

Ghana continued to be a net exporter of electricity in September 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

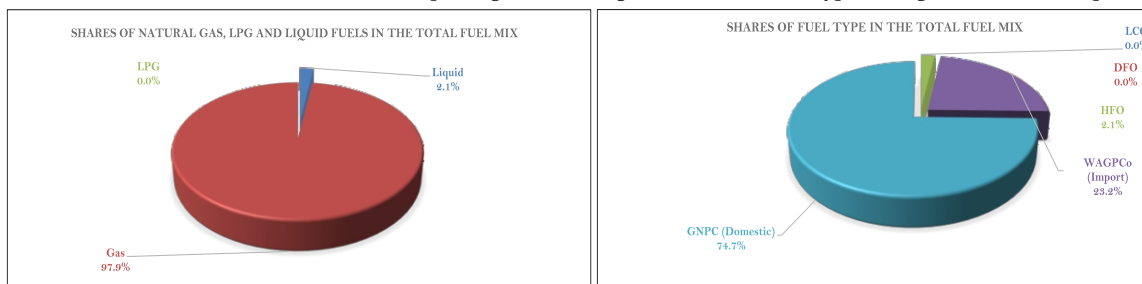


Figure 4a: Contribution of Natural Gas Supply by sources

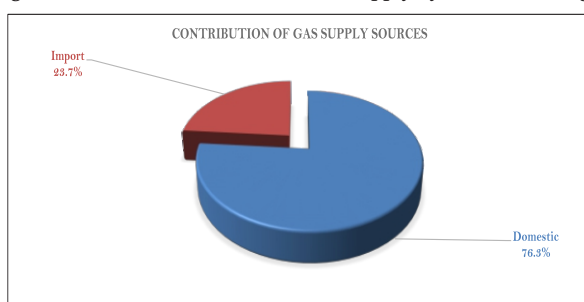
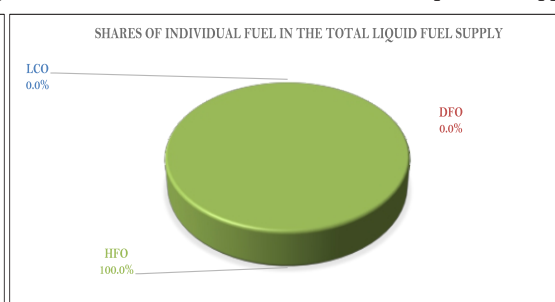


Figure 4b: Contribution of individual fuel in the liquid fuel supply

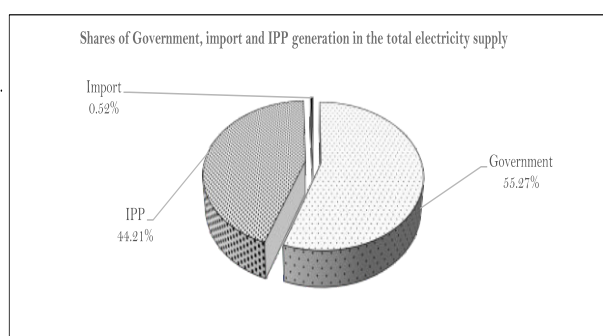
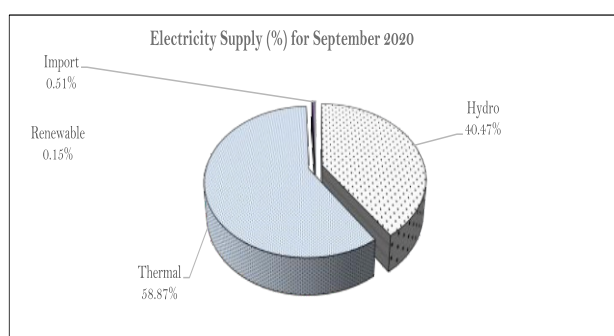


| Peak Electricity Supply - September 2020 |                                     |                                    |                          |
|--|-------------------------------------|------------------------------------|--------------------------|
| Source of Supply                         | Generation at System Peak Load (MW) | Generation at Ghana Peak Load (MW) | Electricity Supply (GWh) |
| AKOSOMBO                                 | 878.70                              | 949.80                             | 478.87                   |
| KPONG                                    | 140.00                              | 141.00                             | 82.95                    |
| BUI                                      | 209.80                              | 213.70                             | 106.53                   |
| SEAP                                     | 393.30                              | 273.80                             | 188.43                   |
| TAPCO                                    | 159.00                              | 107.00                             | 81.12                    |
| TICO                                     | 211.00                              | 212.00                             | 80.57                    |
| TT1PP                                    | -                                   | 106.00                             | 25.22                    |
| CENIT                                    | 108.00                              | 107.00                             | 61.49                    |
| TT2PP                                    | 10.00                               | -                                  | 2.91                     |
| MRP                                      | -                                   | 14.00                              | 34.86                    |
| KARPOWER                                 | 393.80                              | 416.30                             | 268.99                   |
| AMERI                                    | 104.20                              | 164.60                             | 105.89                   |
| KTPP                                     | 100.00                              | 102.00                             | 71.71                    |
| Trojan Power                             | -                                   | -                                  | -                        |
| CENPOWER                                 | 180.00                              | -                                  | 94.39                    |
| AKSA                                     | 111.70                              | 128.30                             | 26.70                    |
| BXC Solar                                | -                                   | -                                  | 2.69                     |
| Safisana                                 | -                                   | -                                  | -                        |
| VRA Solar                                | -                                   | -                                  | 0.22                     |
| Genser                                   | -                                   | -                                  | 37.41                    |
| IMPORT                                   | 2,999.50                            | 2,935.50                           | 0.64                     |
| Export to CIE at peak                    | -                                   | -                                  | 46.92                    |
| Export to CEB at peak                    | 212.00                              | 42.00                              | 2.04                     |
| Export to Sonabel                        | 120.00                              | 118.00                             | 72.01                    |
| System Coincident Peak Load              | <b>2,999.50</b>                     |                                    |                          |
| Ghana Coincident Peak Load               |                                     | <b>2,775.50</b>                    |                          |
| Total Supply                             |                                     |                                    | <b>1,751.60</b>          |
| Total Supply without export              |                                     |                                    | <b>1,630.63</b>          |

# OPERATIONAL FACT SHEET

| Average Monthly Flowrate (MMSCFD) |                 |
|-----------------------------------|-----------------|
| Location                          | Monthly Average |
| Etoki                             | <b>58.72</b>    |
| Tema WAGPCo                       | <b>126.39</b>   |
| Aboadze WAGPCo                    | <b>0.00</b>     |
| Aboadze GNGC                      | <b>42.32</b>    |
| Reverse Flow                      | <b>79.10</b>    |

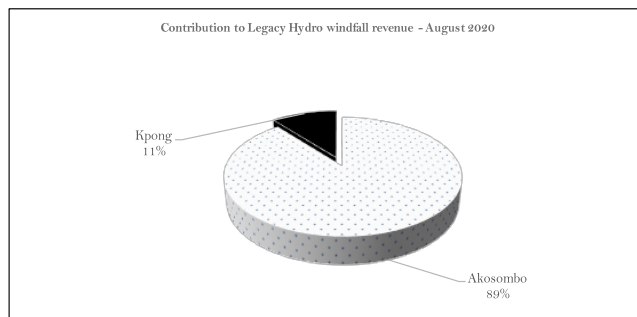
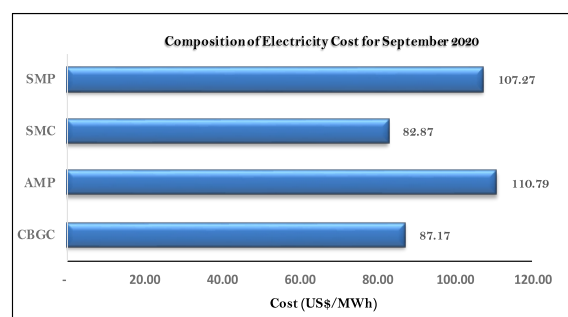
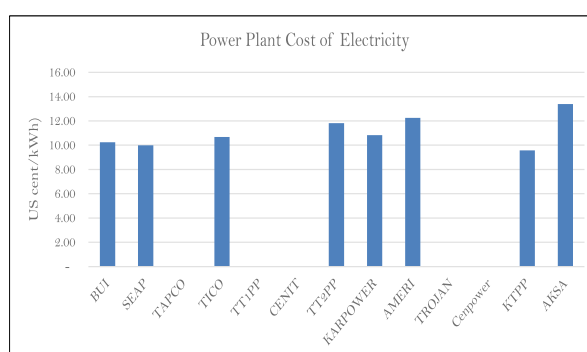
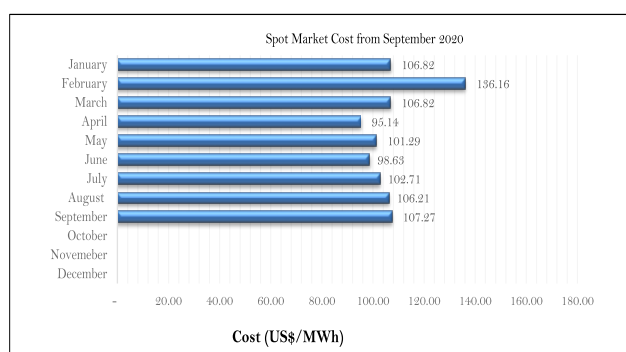
| Sep-20           |                      |                |                              |
|------------------|----------------------|----------------|------------------------------|
|                  | Beginning month (ft) | End month (ft) | Change in water level (feet) |
| <b>Hydro Dam</b> |                      |                |                              |
| <b>Akosombo</b>  | 259.57               | 265.05         | 5.48                         |
| <b>Bui</b>       | 558.50               | 562.99         | 4.49                         |



| Power Plant Data September 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                | 54.50                          | 400.27                       | -                               | -                       | -                       | -                       | -                       |
| Kpong                           | 160.00                  | 63.75                          | 73.44                        | -                               | -                       | -                       | -                       | -                       |
| Bui                             | 400.00                  | 44.77                          | 128.93                       | -                               | -                       | -                       | -                       | -                       |
| SEAP                            | 560.00                  | 75.44                          | 304.19                       | 2,413,663.47                    | -                       | -                       | -                       | -                       |
| TAPCO                           | 330.00                  | 5.19                           | 12.33                        | 116,645.59                      | -                       | -                       | -                       | -                       |
| TICO                            | 340.00                  | 28.72                          | 70.30                        | 810,219.48                      | -                       | -                       | -                       | -                       |
| TT1PP                           | 126.00                  | 6.66                           | 6.04                         | 80,578.39                       | -                       | -                       | -                       | -                       |
| CENIT                           | 126.00                  | 66.98                          | 60.77                        | 697,673.30                      | -                       | -                       | -                       | -                       |
| TT2PP                           | 87.00                   | 20.57                          | 12.89                        | 166,327.76                      | -                       | -                       | -                       | -                       |
| KARPOWER                        | 470.00                  | 67.70                          | 229.09                       | 1,847,320.54                    | -                       | -                       | -                       | -                       |
| AMERI                           | 250.00                  | 28.37                          | 51.07                        | 524,522.34                      | -                       | -                       | -                       | -                       |
| Cenpower                        | 370.00                  | -                              | -                            | -                               | -                       | -                       | -                       | -                       |
| TROJAN                          | 56.00                   | -                              | -                            | -                               | -                       | -                       | -                       | -                       |
| KTPP                            | 220.00                  | 42.70                          | 67.64                        | 753,646.05                      | -                       | -                       | -                       | -                       |
| AKSA                            | 360.00                  | 8.38                           | 21.72                        | -                               | -                       | -                       | 178,057.42              | -                       |
| Amandi                          | 192.00                  | 29.48                          | 40.76                        | 305,183.17                      | -                       | -                       | -                       | -                       |
| Bridge Power                    | -                       | -                              | -                            | -                               | -                       | -                       | -                       | -                       |
| GENSER                          | 95.00                   | 54.25                          | 37.11                        | 479,649.14                      | -                       | -                       | -                       | -                       |
| VRA Solar                       | 2.50                    | 12.44                          | 0.22                         | -                               | -                       | -                       | -                       | -                       |
| BXC                             | 20.00                   | 13.93                          | 2.01                         | -                               | -                       | -                       | -                       | -                       |
| Meinergy                        | 20.00                   | 12.60                          | 1.81                         | -                               | -                       | -                       | -                       | -                       |
| <b>Total</b>                    | <b>5,204.50</b>         | <b>40.58</b>                   | <b>1,520.58</b>              | <b>8,195,429.22</b>             | <b>-</b>                | <b>-</b>                | <b>178,057.42</b>       | <b>-</b>                |

# ECONOMIC FACT SHEET

|   |          | Actual  | Projected | Change |
|---|----------|---------|-----------|--------|
| Average Market Energy Cost              | US\$/MWh | 69.18   | 69.63     | (0.45) |
| Average Market Capacity Charge (AMCC)   | US\$/MWh | 41.61   | 37.36     | 4.25   |
| Total Average Market Cost (TAC)         | US\$/MWh | 110.79  | 106.98    | 3.81   |
| System Marginal Cost (SMC)              | US\$/MWh | 82.87   | 85.01     | (2.14) |
| System Marginal Capacity Charge (SMCC)  | US\$/MWh | 24.41   | 23.95     | 0.46   |
| Spot Market Price (SMP)                 | US\$/MWh | 107.27  | 108.96    | (1.69) |
| Composite Bulk Generation Charge (CBGC) | US\$/MWh | 87.17   | 87.17     | -      |
| Deviation of TAC from CBGC              | US\$/MWh | (23.62) | (19.81)   | (3.81) |
| Deviation of SMP from CBGC              | US\$/MWh | (20.10) | (21.79)   | 1.69   |

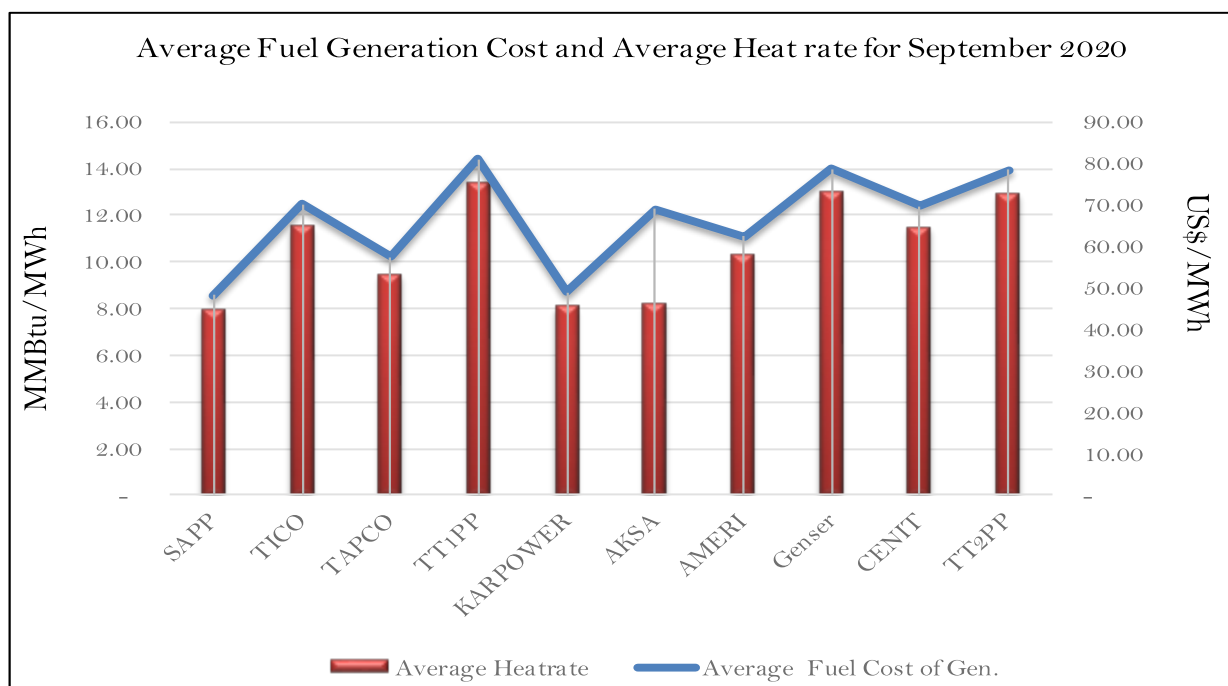


|            | Gazetted Natural Gas Price | Weighted average Natural Gas Price | LCO  | HFO  | DFO   | LPG   |
|------------|----------------------------|------------------------------------|------|------|-------|-------|
| US\$/MMBTu | 6.08                       | 6.25                               | 8.67 | 8.41 | 12.38 | 12.54 |

| Average Fuel Prices |            |                |
|---------------------|------------|----------------|
|                     |            | Sep-20         |
| Fuel Type           | Unit       | Delivered Cost |
| Natural Gas         | US\$/MMBTu | 6.08           |
| LCO                 | US\$/BBL   | 45.86          |
| HFO                 | US\$/Tonne | 263.30         |
| DFO                 | US\$/Tonne | 500.05         |
| LPG                 | US\$/Tonne | 534.95         |



## ECONOMIC FACT SHEET



| Power Plant | Capacity Utilization (%) | Average Heat rate (Btu/kWh) | Average Fuel Cost of Generation (US\$/MWh) | Emission Factor (kgCO <sub>2</sub> /kWh) |
|-------------|--------------------------|-----------------------------|--|--|
| Akosombo    | 54.50                    | -                           | -  | -  |
| Kpong       | 63.75                    | -                           | -  | -  |
| Bui         | 44.77                    | -                           | -  | -  |
| SAPP        | 75.44                    | 7,934.66                    | 48.24                                      | 0.42                                     |
| TAPCO       | 5.19                     | 9,461.07                    | 57.52                                      | 0.50                                     |
| TICO        | 28.72                    | 11,525.17                   | 70.07                                      | 0.61                                     |
| TT1PP       | 6.66                     | 13,340.79                   | 81.11                                      | 0.71                                     |
| CENIT       | 66.98                    | 11,481.33                   | 69.81                                      | 0.61                                     |
| TT2PP       | 20.57                    | 12,905.83                   | 78.47                                      | 0.68                                     |
| Amandi      | 67.70                    | 7,487.80                    | 45.53                                      | 0.40                                     |
| KARPOWER    | 67.70                    | 8,063.59                    | 49.03                                      | -  |
| AMERI       | 28.37                    | 10,271.06                   | 62.45                                      | 0.54                                     |
| TROJAN      | -                        | -                           | -  | -  |
| KTPP        | 42.70                    | 11,142.43                   | 67.75                                      | 0.59                                     |
| AKSA        | 8.38                     | 8,197.44                    | 68.93                                      | 0.65                                     |
| Cenpower    | -                        | -                           | -  | -  |
| Genser      | 54.25                    | 12,925.06                   | 78.58                                      | 0.69                                     |

### TRENDING NEWS IN THE GHANA WHOLESALE ELECTRICITY MARKET

#### 2.1 SENIOR MINISTER INAUGURATES 250 MEGAWATTS HYDRO-SOLAR HYBRID PROJECT AT BUI DAM

Mr Osafo Maafo, the Senior Minister on Friday inaugurated \$48 million-dollar solar plant constructed by the Bui Power Authority, managers of the Bui Dam at Bui in the Banda District of the Bono Region.

The solar farm will add 250 megawatts of power to augment the dam's annual production capacity.

Mr Maafo, who represented President Nana Addo Dankwa Akufo-Addo, indicated the facility reiterates Ghana's resolve to diversify the country's energy generation portfolio and increase the renewable energy component of her energy mix.

"This further shows my government's commitment to deliver on its promises. We had promised to increase the Renewable Energy component in our Energy Mix to 10% by 2030.

"It is instructive to note that we are well on our way to achieving this feat, and perhaps earlier than expected. With Bui Power Authority's significant addition of 250MW, VRA's 100MW and the other small solar and hydro projects, I can assure you that Ghana will attain the 10% Renewable Energy target by 2030".

"Our country is blessed with abundant sunshine which provides us with natural resource required to develop solar power on a large scale. In addition, there has been a major reduction of the cost of the development of renewable projects worldwide, including solar, which should make it affordable for the good people of this country".

In recognition of the progress of the BPA, the Senior Minister announced the government had passed the Amendment Bill to the Bui Power Authority Act, ACT 740 of 2007, to incorporate two clauses that would ensure the Authority undertook more renewable energy responsibilities and endeavours.

"Let me reiterate that Renewable Energy as we all know is clean energy and environmentally friendly which will entrench further Ghana's stance to fight against global warming and climate change".

"It is gratifying to note the percentage of local content in this project, which shows the investment and confidence my government has in the young human resource capabilities of this country".

The project, Mr Maafo explained, involved the employment of about 350 people mainly from the communities within the Bui enclave.

He congratulated the BPA on the various interventions it had undertaken in the community particularly the Livelihood Enhancement Programme Business Modules where close to 1,000 young people had been given economically viable jobs to execute for the Authority.

Already, Mr Maafo said about GH¢900,000.00 had been disbursed to constitute these young people into groups of cooperatives and resourced with the required work tools and equipment, and facilities to fully set them up to undertake their respective independent businesses.

"This fulfils government's promise of increasing the employment opportunities for the youth of this country. There will be more business modules which will further engage more youth within the Banda area".

He expressed government's appreciation to the traditional leaders and all stakeholders for their support and co-operation towards the development of this and future projects within this area and assured the BPA was working with the Lands Commission to pay some of the land compensation, using its internally generated funds.

Mr Afare Apeadu Donkor, the Board Chairman of the Board of Directors of the BPA, said the construction works on the phase two of the project in addition to the novel Floating Solar Plant, expected to be the first of its kind in the country was progressing steadily.

The Board, in addition, he noted had spearheaded the construction of essential foundational services to stimulate economic growth and quality of life improvement that would open the economy and stimulate growth at the Bui dam enclave.

Some of these projects include modern clubhouse, an executive lodge for dignitaries, downstream embankment improvement works, amenities for the clubhouse as well as other security installations at various stages of completion.

Mr Donkor explained the Board approved for the development of the seventeen business modules and skills set for alternative livelihoods for Project Affected Persons.

The skills set include aquaculture, sanitation, fumigation, fire control, lawn maintenance, catering service, warehouse maintenance, car washing, vulcanising, fishing, fish mongering, artisans, event and entertainment management, animal husbandry, vegetable farming and skills learning to create jobs for the local people.

First phase of the programme had been completed and benefited 169 affected people, he added.

Source: Peacefmonline.com

### 2.2 SETTLE DEBT TO AVOID WITHDRAWAL OF SERVICES – POWER PRODUCERS

In a notice to the Ghana Grid Company (GRIDCo) and the Electricity Company of Ghana (ECG), the Chamber of Independent Power Producers, Distributors and Bulk Consumers expressed its resolve to withdraw its services if payment was not made soon.

Even though the notice, issued on November 12, 2020, with received stamps of the ECG and GRIDCo, did not give a specific date on which the chamber would cut off services, it said the CCRs of the IPPs would communicate with GRIDCo's control centre system on when it would delink if payment was not made.

"We would like to inform you about our firm resolve to withdraw our services in the coming days ad infinitum. This action follows our demand on the ECG and government of Ghana to settle at least 80 per cent of our overdue receivables, worth about a billion dollars, as a matter of urgency and priority," it said in a letter signed by its Chief Executive Officer, Mr Elikplim Kwabla Apetorgbor, and sighted by the Daily Graphic.

The IPPs contribute 50 per cent of the nation's power generating capacity daily.

Later in an interview with the Daily Graphic, Mr Apetorgbor explained that the chamber had not given a fixed date for the withdrawal of services because it hoped the debtors would honour their obligations.

#### Members

The 12-member chamber comprises Sunon Asogli Power, Cenpower Generations, Karpowership, CENIT Energy, AKSA Energy, BXC and Meienenergy.

The rest are Trojan Power, Early Power, Amandi Energy, Enclave Power and B5 Plus, which are all said to be in liquidity crises.

#### Impact of debt

Mr Apetorgbor said the debt was having a serious impact on technical, administrative and other needs of the IPPs and was, therefore, making the financing of the daily operations of the companies difficult.

He urged the government and the ECG to treat the plea with urgency.

He said if the government failed to meet its demands, the IPPs would not be able to guarantee the regular supply of power to the grid, adding: "We don't want a situation where we will say that we are giving the government five or seven days to pay, which could lead to the government paying us something small – that is not good," he said.

Previously, he said, when such ultimatums were given, the government quickly paid in bits, with a plea that the IPPs bore with it.

"Interestingly, while we bear with the government, the IPPs are borrowing at high cost on the local and the international markets to keep our turbines on.

"One thing we should not forget is that we continually go for facilities with high interest rate from the financial market, produce and keep the power on, but when we decide to add some interest to our charges or long overdue receivables, the government says no, but we pay our creditors," Mr Apetorgbor added.

Presently, he said, the plants required major maintenance, which comes with a cost, saying that with delays by the government, "we are unable to meet our maintenance schedules to keep our plants more efficient. If the people do not get power, it is because of the debt".

Source: graphic.com.gh

### Acronyms

*AGPP = Atuabu Gas Processing Plant*  
*CBGC = Composite Bulk Generation Charge*  
*DFO = Distillate Fuel Oil*  
*ECG = Electricity Company of Ghana*  
*ESP = Electricity Supply Plan*  
*GHp = Ghana Pesewa*  
*GWh = Giga-watt Hours*  
*KTPP = Kpone Thermal Power Plant*  
*MRP = Mine Reserve Plant*  
*LCO = Light Crude Oil*  
*LTA = Long Term Average*  
*MMscf = Million Standard Cubic Feet*  
*NITS = National Interconnected Transmission System*  
*SAPP = Sunon Asogli Power Plant*  
*SNEP = Strategic National Energy Plan*  
*TT2PP = Tema Thermal 2 Power Plant*  
*VRA = Volta River Authority*  
*WAGP = West African Gas Pipeline*

*Btu = British Thermal Units*  
*CUF = Capacity Utilization Factor*  
*EC = Energy Commission*  
*EMOP = Electricity Market Oversight Panel*  
*FPSO = Floating Production, Storage and Offloading*  
*GNGC = Ghana National Gas Company*  
*HFO = Heavy Fuel Oil*  
*kWh = Kilo-watt hours*  
*LEAP = Long-range Energy Alternative Planning*  
*LI = Legislative Instrument*  
*MW = Megawatt*  
*MWh = Mega-watt hours*  
*PV = Photovoltaic*  
*SMP = System Marginal Price*  
*TEN = Tweneboa, Enyenra, Ntomme*  
*TT2PP = Tema Thermal 2 Power Plant*  
*WAGPCo = West African Gas Pipeline Company*  
*WEM = Wholesale Electricity Market*

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