# ELECTRICITY GENERATION AND DISTRIBUTION

## Fourth Quarter 2018 Stats Brief

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## STATISTICS BOTSWANA

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## Preface

This statistical brief is intended to apprise on Electricity Generation, Importation and Distribution by presenting Monthly, Quarterly and Yearly Volumes as well as Indices for Electricity Generation in Botswana. Also included are Year-on-Year and Quarter-on-Quarter percentage changes in Indices of Electricity Generation from 2008 to the fourth quarter of 2018. In subsequent sections of this report, emphasis will be on the fourth quarter of 2018, compared to the third quarter in 2018, and the corresponding quarter in 2017. This report uses 2013 as the base year.

The Index of Electricity Generation (IEG) stood at 107.7 during the fourth quarter of 2018, compared to 179.1 recorded during the corresponding quarter in 2017, giving a decrease of 39.8 percent year-on-year change. Comparison of the last two quarters of 2018 shows a decrease of 41.5 percent, from 184.3 during the third quarter to 107.7 during the current quarter.

Statistics Botswana is mandated to compile data on industrial production in Botswana, hence electricity indices are only confined to electricity generated locally. However, importation and distribution volumes, and their percentage changes are also included in the analysis. This is intended to indicate Botswana's progress over time, towards generating adequate electricity to meet her demand. The data used on this brief is sourced from the Botswana Power Corporation.

The release further shows changes in the volume of electricity generation in a given period against the base year (2013), and hence provides a reflection of the trend in the local electricity sector.

For more information, contact the Directorate of Stakeholder Relations at 3671300. All Statistics Botswana outputs/publications are available on the website at www.statsbots.org.bw and also at Statistics Botswana Information Resource Centre (Head-Office, Gaborone).

I sincerely thank all stakeholders involved in the formulation of this brief, for their continued support, as we strive to better serve users of our products and services.

**Dr. Burton S. Mguni**
**Statistician General**
**March 2019**

## 1.0 Summary of Findings of the Index of Electricity Generation (IEG)

**All figures in this report are not seasonally adjusted.**

Summary key indicators of Electricity Generation from the first quarter of 2013 to the fourth quarter of 2018 are presented on **Table 1**. During the fourth quarter of 2018, the Electricity Generation Index (IEG) stood at 107.7, reflecting a decrease of 39.8 percent compared to 179.1 recorded during the corresponding quarter in 2017. The quarter-on-quarter comparison shows a decrease of 41.5 percent, from 183.4 during the third quarter of 2018 to the index of **107.7** during the current quarter.

### Table 1: Selected Key Indicators of Electricity Generation: 2013 First Quarter to 2018 Fourth Quarter

| Period | Index of the Physical Volume of Electricity Generation | Year-on-Year Percentage Change | Quarter-on-Quarter Percentage Change |
|---|---|---|---|
| **2013_Q1** | 66.5 | 151.4 | 0.0 |
| **Q2** | 88.5 | 202.8 | 33.1 |
| **Q3** | 142.7 | 216.7 | 61.3 |
| **Q4** | 102.3 | 53.8 | (28.3) |
| **2014_Q1** | 75.5 | 13.4 | (26.2) |
| **Q2** | 172.6 | 95.1 | 128.6 |
| **Q3** | 194.2 | 36.1 | 12.6 |
| **Q4** | 119.6 | 16.9 | (38.4) |
| **2015_Q1** | 123.4 | 63.5 | 3.2 |
| **Q2** | 149.9 | (13.2) | 21.4 |
| **Q3** | 140.8 | (27.5) | (6.0) |
| **Q4** | 167.8 | 40.2 | 19.2 |
| **2016_Q1** | 105.5 | (14.5) | (37.1) |
| **Q2** | 115.7 | (22.8) | 9.7 |
| **Q3** | 157.3 | 11.7 | 36.0 |
| **Q4** | 186.3 | 11.1 | 18.4 |
| **2017_Q1** | 166.1 | 57.4 | (10.8) |
| **Q2** | 160.6 | 38.8 | (3.4) |
| **Q3** | 212.6 | 35.2 | 32.4 |
| **Q4** | 179.1 | (3.9) | (15.8) |
| **2018_Q1** | 162.3 | (2.3) | (9.4) |
| **Q2** | 195.0 | 21.4 | 20.1 |
| **Q3** | 184.3 | (13.3) | (5.5) |
| **Q4** | 107.7 | (39.8) | (41.5) |

*Note:  1. ( ) Indicates negative figures*

**Figure 1** presents the trend of the Index of Electricity Generation from the first quarter of 2013 to the fourth quarter of 2018. Although it depicts fluctuations, local generation has been growing steadily over time except for the sharp decline during the current quarter.

**Figure 1: Index of Electricity Generation: 2013 First Quarter to 2018 Fourth Quarter**
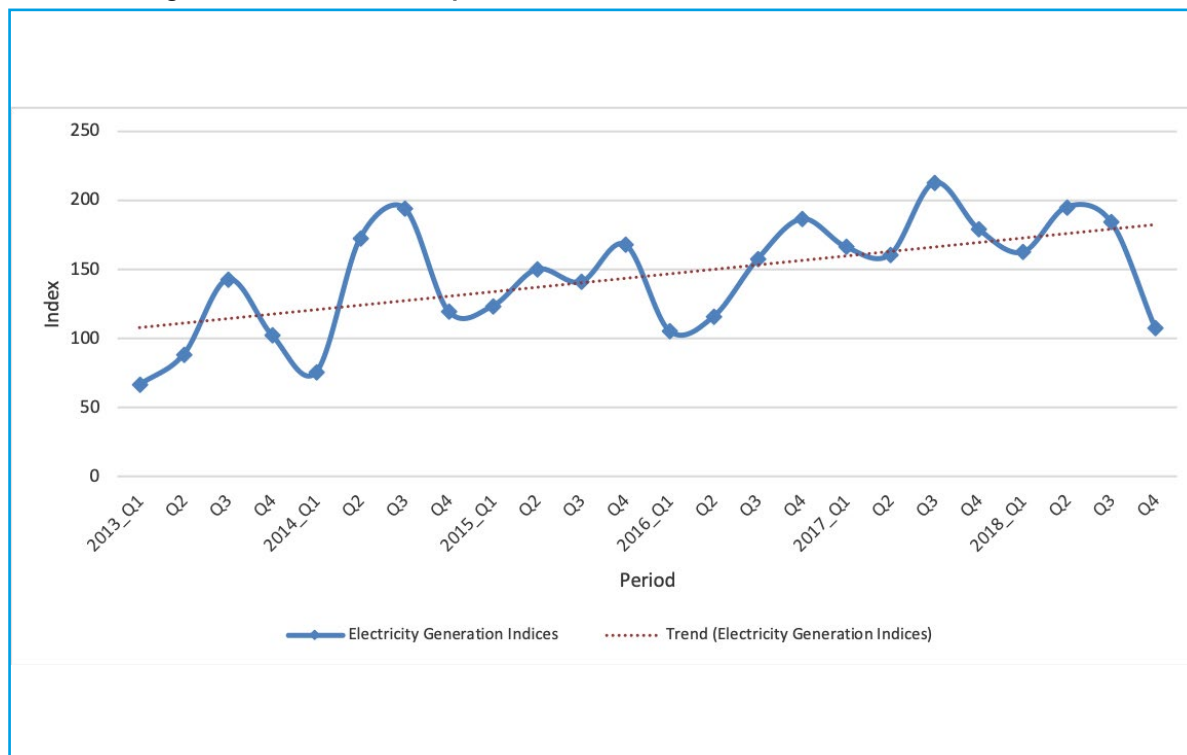


## 1.1 Electricity Generation

This Sub-Section discusses the physical volume of electricity generated locally as presented in **Table 2**. The table forms the basis for computation of indices of electricity generation in **Table 3**. The year-on-year and quarter-on-quarter percentage changes in the volume of electricity generated are presented in **Table 4** and **Table 5**, covering the period 2008 to 2018 fourth quarter.

The physical volume of electricity generated locally decreased by 39.8 percent from 752,877 MWH during the fourth quarter of 2017 to 452,937 MWH during the period under review. The quarter-on-quarter perspective shows that local electricity generation decreased by 41.5 percent, from 774,822 MWH during the third quarter of 2018 to 452,937 MWH during the current quarter.

The decrease came as a result of the minimal operations following remedial activities undertaken at the Morupule B power station during the first two weeks of October 2018. During that time, the emergency power plants were engaged to augment output, but this was not able to cover for the loss resulting from the minimal operations at Morupule B. During the third week of October 2018, two of the four units accordingly resumed operation and continued for the rest of the quarter.

## 1.2 Imported Electricity

The discussions in this section are based on **Table 6**, and **Table 7** as well as **Figure 2.**

The physical volume of imported electricity increased by 138.3 percent (296,163 MWH), from 214,135 MWH during the fourth quarter of 2017 to 510, 298 MWH during 2018 fourth quarter.

The quarter-on-quarter comparison shows an increase of 122.4 percent (280, 871 MWH), from 229, 427 MWH during the third quarter of 2018 to 510, 298 MWH during the period under review. This increase was necessitated by the need to augment local production in order to fulfill the domestic demand.

**Figure 2: Physical Volume of Imported Electricity (MWH): 2013 First Quarter to 2018 Fourth Quarter**
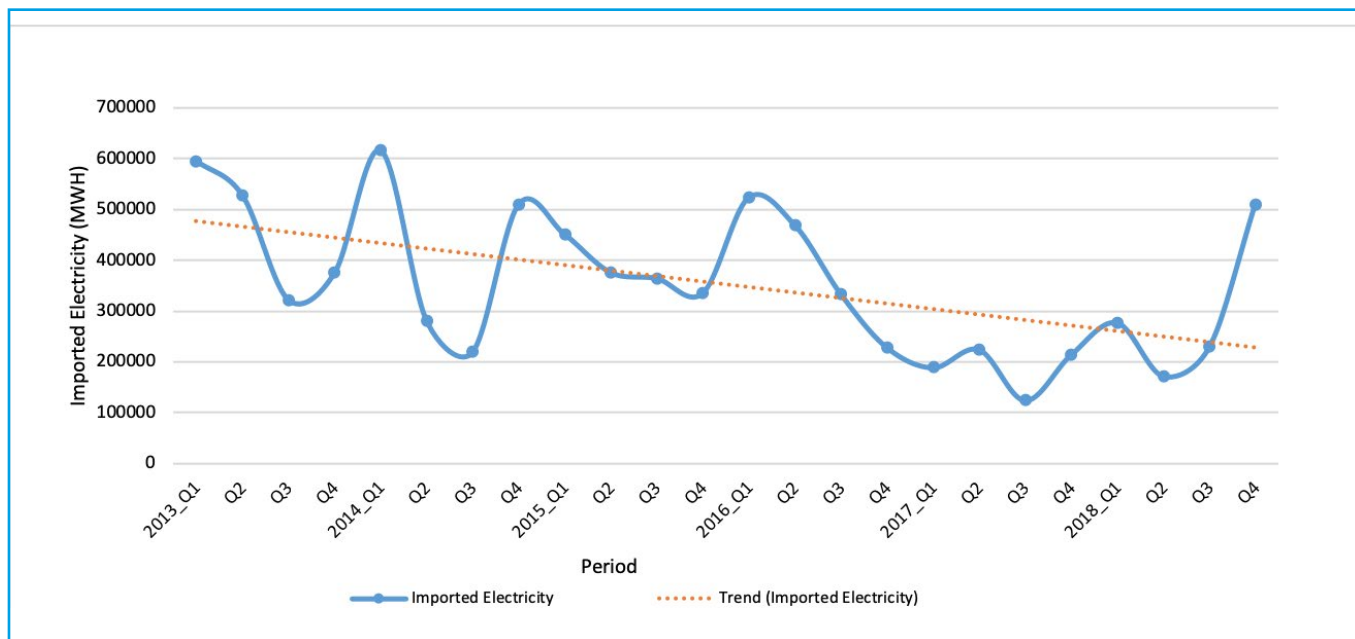


As illustrated in **Figure 2**, imported electricity shows that even though there are fluctuations in the physical volume of imported electricity, generally importation of electricity depicts a decreasing trend, except for the current quarter which shows a significant increase. The general decrease is indicative of the ongoing efforts to generate enough electricity to meet demand in Botswana, hence leading to less reliance on electricity imports.

The imported electricity stood at 510, 298 MWH during the last quarter of 2018. The Southern African Power Pool (SAPP) was the main source of imported electricity at 65.6 percent of total electricity imports. The balance was imported from Eskom at 28.6 percent, cross border markets at 4.4 percent and Nam Power at 1.4 percent.

## 1.3 Distribution of Electricity

The section combines the local generation and imported electricity that is available for distribution in Botswana. This does not take into account electricity used for auxiliary services, pumping, network losses as well as production of electricity through incineration of waste. The computation of electricity distribution is guided by the International Recommendations for Industrial Statistics **(IRIS)** 2008. Tables **8**, **9** and **10** form the basis for discussion under this subsection.

**Table 8** shows the physical volume of electricity distributed from 2008 to the fourth quarter of 2018, while **Table 9** presents annual percentage changes in the volume of electricity distributed from 2008 to the fourth quarter of 2018. These tables can also be used as guidance with regard to whether electricity distribution is improving over time, thereby indicating that there are ongoing efforts to meet the domestic demand.

From a year-on-year perspective, the amount of distributed electricity declined by 0.4 of a percentage point (3, 776.7 MWH), from 967,012 MWH during the last quarter of 2017 to 963, 235 MWH during the quarter under review.

The quarter-on-quarter comparison shows a decline of 4.1 percent (41, 014 MWH), from 1, 004,249 MWH during the third quarter of 2018 to 963, 235 MWH during the current quarter.

## 1.3.1 Contribution of Electricity Generation to Distribution

Electricity generation given as a percentage of electricity distributed is of paramount importance in assessing whether local generation is improving overtime to reduce reliance on imported electricity. This information is displayed in **Table 10**.

It can be observed from **Table 10** that electricity generated locally contributed 47.0 percent to electricity distributed during the fourth quarter of 2018, compared to a contribution of 77.9 percent during the same quarter in 2017.  This shows a decline of 30.9 percentage points.

On the other hand, the quarter-on-quarter comparison shows that the contribution of electricity generated to electricity distributed during the current quarter decreased by 30.2 percentage points compared to the 77.2 percent contribution of locally generated electricity during the third quarter of 2018.

**Table 2: Physical Volume of Electricity Generation (MWH): January 2008 – December 2018**

| Period | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Jan | 53,926 | 33,922 | 44,442 | 39,195 | 26,574 | 110,960 | 137,802 | 158,907 | 206,381 | 245,598 | 209,333 |
| Feb | 49,732 | 37,890 | 38,641 | 32,847 | 16,938 | 80,410 | 77,067 | 180,520 | 127,975 | 216,264 | 227,955 |
| Mar | 51,072 | 46,413 | 55,401 | 20,079 | 67,761 | 88,358 | 102,377 | 179,400 | 109,272 | 236,589 | 245,092 |
| Apr | 49,313 | 38,987 | 40,872 | 29,593 | 34,069 | 94,011 | 151,675 | 195,568 | 112,765 | 195,073 | 210,965 |
| May | 61,558 | 49,464 | 41,943 | 15,762 | 39,826 | 140,454 | 252,235 | 206,905 | 179,837 | 205,705 | 310,500 |
| Jun | 58,334 | 20,132 | 30,676 | 23,045 | 48,928 | 137,414 | 321,453 | 227,503 | 193,586 | 273,639 | 298,291 |
| Jul | 54,588 | 38,103 | 33,156 | 27,814 | 81,013 | 158,120 | 318,627 | 240,314 | 213,841 | 311,655 | 293,739 |
| Aug | 47,278 | 48,795 | 39,594 | 24,536 | 11,205 | 223,420 | 296,036 | 177,052 | 219,402 | 315,552 | 289.885 |
| Sep | 39,890 | 36,522 | 35,177 | 21,063 | 97,177 | 218,222 | 201,802 | 174,617 | 228,002 | 266,623 | 191,199 |
| Oct | 42,689 | 32,361 | 37,746 | 27,166 | 77,236 | 32,183 | 71,243 | 301,913 | 299,002 | 234,090 | 73,018 |
| Nov | 40,367 | 26,443 | 20,894 | 23,044 | 113,384 | 203,228 | 244,723 | 213,798 | 213,303 | 296,547 | 121,910 |
| Dec | 38,538 | 34,885 | 38,430 | 19,231 | 89,101 | 194,717 | 186,915 | 189,490 | 269,893 | 222,240 | 258,009 |
| | | | | | | | | | | | |
| Q1 | 154,730 | 118,225 | 138,485 | 92,120 | 111,274 | 279,728 | 317,245 | 518,828 | 443,628 | 698,451 | 682,380 |
| Q2 | 169,206 | 108,584 | 113,491 | 68,400 | 122,823 | 371,879 | 725,363 | 629,976 | 486,188 | 675,047 | 819,755 |
| Q3 | 141,756 | 123,420 | 107,927 | 73,413 | 189,395 | 599,762 | 816,465 | 591,983 | 661,245 | 893,831 | 774,822 |
| Q4 | 121,594 | 93,689 | 97,070 | 69,441 | 279,721 | 430,128 | 502,881 | 705,201 | 783,141 | 752,877 | 452,937 |
| **TOTAL** | **587,286** | **443,918** | **456,972** | **303,374** | **703,213** | **1,681,497** | **2,361,954** | **2,445,988** | **2,374,202** | **3,020,206** | **2,729,895** |

**Table 3: Indices of Physical Volume of Electricity Generation: January 2008 – December 2018**

| Period | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Jan | 38.5 | 24.2 | 31.7 | 28.0 | 19.0 | 79.2 | 98.3 | 113.4 | 147.3 | 175.3 | 149.4 |
| Feb | 35.5 | 27.0 | 27.6 | 23.4 | 12.1 | 57.4 | 55.0 | 128.8 | 91.3 | 154.3 | 162.7 |
| Mar | 36.4 | 33.1 | 39.5 | 14.3 | 48.4 | 63.1 | 73.1 | 128.0 | 78.0 | 168.8 | 174.9 |
| Apr | 35.2 | 27.8 | 29.2 | 21.1 | 24.3 | 67.1 | 108.2 | 139.6 | 80.5 | 139.7 | 150.6 |
| May | 43.9 | 35.3 | 29.9 | 11.2 | 28.4 | 100.2 | 180.0 | 147.7 | 128.3 | 146.8 | 221.6 |
| June | 41.6 | 14.4 | 21.9 | 16.4 | 34.9 | 98.1 | 229.4 | 162.4 | 138.2 | 195.3 | 212.9 |
| July | 39.0 | 27.2 | 23.7 | 19.8 | 57.8 | 112.8 | 227.4 | 171.5 | 152.6 | 222.4 | 209.6 |
| Aug | 33.7 | 34.8 | 28.3 | 17.5 | 8.0 | 159.4 | 211.3 | 126.4 | 156.6 | 225.2 | 206.9 |
| Sep | 28.5 | 26.1 | 25.1 | 15.0 | 69.4 | 155.7 | 144.0 | 124.6 | 162.7 | 190.3 | 136.4 |
| Oct | 30.5 | 23.1 | 26.9 | 19.4 | 55.1 | 23.0 | 50.8 | 215.5 | 214.1 | 167.1 | 52.1 |
| Nov | 28.8 | 18.9 | 14.9 | 16.4 | 80.9 | 145.0 | 174.6 | 152.6 | 152.2 | 211.6 | 87.0 |
| Dec | 27.5 | 24.9 | 27.4 | 13.7 | 63.6 | 139.0 | 133.4 | 135.2 | 192.6 | 158.6 | 184.1 |
| | | | | | | | | | | | |
| Q1 | 36.8 | 28.1 | 32.9 | 21.9 | 26.5 | 66.5 | 75.5 | 123.4 | 105.5 | 166.1 | 162.3 |
| Q2 | 40.3 | 25.8 | 27.0 | 16.3 | 29.2 | 88.5 | 172.6 | 149.9 | 115.7 | 160.6 | 195.0 |
| Q3 | 33.7 | 29.4 | 25.7 | 17.5 | 45.1 | 142.7 | 194.2 | 140.8 | 157.3 | 212.6 | 184.3 |
| Q4 | 28.9 | 22.3 | 23.1 | 16.5 | 66.5 | 102.3 | 119.6 | 167.8 | 186.3 | 179.1 | 107.7 |
| **Year** | **34.9** | **26.4** | **27.2** | **18.0** | **41.8** | **100.0** | **140.5** | **145.5** | **141.2** | **179.6** | **162.3** |

**Table 4: Annual Percentage Changes in the Indices of the Physical Volume of Electricity Generation: January 2008 – December 2018**

| Period | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Jan | (4.2) | (37.1) | 31.0 | (11.8) | (32.2) | 317.5 | 24.2 | 15.3 | 29.9 | 19.0 | (14.8) |
| Feb | (11.7) | (23.8) | 2.0 | (15.0) | (48.4) | 374.7 | (4.2) | 134.2 | (29.1) | 69.0 | 5.4 |
| Mar | (11.2) | (9.1) | 19.4 | (63.8) | 237.5 | 30.4 | 15.9 | 75.2 | (39.1) | 116.5 | 3.6 |
| Apr | (12.1) | (20.9) | 4.8 | (27.6) | 15.1 | 175.9 | 61.3 | 28.9 | (42.3) | 73.5 | 7.8 |
| May | 24.7 | (19.6) | (15.2) | (62.4) | 152.7 | 252.7 | 79.6 | (18.0) | (13.1) | 14.4 | 50.9 |
| Jun | 18.2 | (65.5) | 52.4 | (24.9) | 112.3 | 180.9 | 133.9 | (29.2) | (14.9) | 41.4 | 9.0 |
| Jul | (10.9) | (30.2) | (13.0) | (16.1) | 191.3 | 95.2 | 101.5 | (24.6) | (11.0) | 45.7 | (5.7) |
| Aug | (24.4) | 3.2 | (18.9) | (38.0) | (54.3) | 1,893.9 | 32.5 | (40.2) | 23.9 | 43.8 | (8.1) |
| Sep | (23.6) | (8.4) | (3.7) | (40.1) | 361.4 | 124.6 | (7.5) | (13.5) | 30.6 | 16.9 | (28.3 |
| Oct | 3.7 | (24.2) | 16.6 | (28.0) | 184.3 | (58.3) | 121.4 | 323.8 | (0.7) | (22.0) | (68.8) |
| Nov | 4.8 | (34.5) | (21.0) | 10.3 | 392.0 | 79.2 | 20.4 | (12.6) | (0.2) | 39.0 | (58.9) |
| Dec | (12.5) | (9.5) | 10.2 | (50.0) | 363.3 | 118.5 | (4.0) | 1.4 | 42.4 | (17.7) | 16.1 |
| | | | | | | | | | | | |
| Q1 | (9.0) | (23.6) | 17.1 | (33.5) | 20.8 | 151.4 | 13.4 | 63.5 | (14.5) | 57.4 | (2.3) |
| Q2 | 9.3 | (35.8) | 4.5 | (39.7) | 79.6 | 202.8 | 95.1 | (13.2) | (22.8) | 38.8 | 21.4 |
| Q3 | (19.5) | (12.9) | (12.6) | (32.0) | 158.0 | 216.7 | 36.1 | (27.5) | 11.7 | 35.2 | (13.3) |
| Q4 | (1.7) | (22.9) | 3.6 | (28.5) | 302.8 | 53.8 | 16.9 | 40.2 | 11.1 | (3.9) | (39.8) |
| TOTAL | (6.0) | (24.4) | 2.9 | (33.6) | 131.8 | 139.1 | 40.5 | 3.6 | (2.9) | 27.2 | (9.6) |

*Note:*
*1. ( ) Denotes negative numbers*


**Table 5: Quarter-on-Quarter Percentage Changes: 2008 – December 2018**

| Period | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Q1 | 25.1 | (2.8) | 47.8 | (5.1) | 60.2 | 0.0 | (26.2) | 3.2 | (37.1) | (10.8) | (9.4) |
| Q2 | 9.4 | (8.2) | (18.0) | (25.7) | 10.4 | 32.9 | 128.6 | 21.4 | 9.7 | (3.4) | 20.1 |
| Q3 | (16.4) | 14.0 | (4.8) | 7.3 | 54.2 | 61.3 | 12.6 | (6.0) | 36.0 | 32.4 | (5.5) |
| Q4 | (14.2) | (24.1) | (10.1) | (5.4) | 47.7 | (28.3) | (38.4) | 19.1 | 18.4 | (15.8) | (41.5) |

*Note:*
*1. ( ) Denotes negative numbers*

**Table 6:  Physical Volume of Imported Electricity (MWH:) January 2008 – December 2018**

| Period | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Jan | 210,395 | 201,994 | 236,110 | 243,795 | 272,338 | 193,786 | 192,251 | 184,564 | 140,172 | 57,679 | 124,148 |
| Feb | 213,161 | 188,165 | 219,836 | 229,027 | 274,079 | 185,022 | 216,031 | 113,430 | 166,303 | 56,951 | 77,257 |
| Mar | 227,289 | 203,111 | 250,756 | 269,723 | 249,777 | 216,621 | 207,923 | 153,098 | 217,261 | 74,422 | 75,865 |
| Apr | 209,664 | 205,743 | 234,466 | 256,694 | 253,390 | 206,965 | 162,767 | 129,605 | 196,075 | 88,783 | 94,226 |
| May | 214,604 | 223,094 | 280,917 | 277,975 | 271,135 | 169,159 | 85,246 | 129,487 | 138,677 | 92,379 | 39,052 |
| Jun | 216,285 | 267,277 | 275,405 | 279,130 | 275,063 | 151,442 | 33,474 | 117,155 | 134,100 | 43,156 | 39,179 |
| Jul | 245,954 | 270,073 | 276,165 | 275,387 | 245,151 | 161,866 | 39,365 | 99,695 | 110,932 | 34,746 | 55,772 |
| Aug | 246,899 | 220,243 | 259,190 | 268,187 | 296,226 | 82,084 | 48,497 | 132,541 | 119,340 | 35,332 | 45,131 |
| Sep | 233,921 | 247,990 | 248,636 | 256,871 | 200,082 | 78,365 | 132,060 | 132,191 | 103,083 | 54,534 | 128,524 |
| Oct | 247,374 | 263,707 | 266,963 | 264,952 | 240,631 | 123,785 | 266,785 | 59,516 | 57,653 | 83,734 | 249,015 |
| Nov | 239,255 | 262,763 | 271,584 | 274,539 | 209,811 | 123,785 | 96,415 | 115,763 | 116,517 | 36,094 | 200,025 |
| Dec | 223,135 | 238,572 | 268,052 | 272,789 | 212,114 | 128,060 | 147,112 | 160,652 | 54,373 | 94,307 | 61,258 |
|  |  |  |  |  |  |  |  |  |  |  |  |
| Q1 | 650,845 | 593,269 | 706,702 | 742,544 | 796,194 | 595,429 | 616,206 | 451,092 | 523,736 | 189,052 | 277,270 |
| Q2 | 640,554 | 696,114 | 790,788 | 813,799 | 799,587 | 527,566 | 281,487 | 376,248 | 468,852 | 224,318 | 172,457 |
| Q3 | 726,774 | 738,305 | 783,991 | 800,444 | 741,459 | 322,315 | 219,922 | 364,427 | 333,355 | 124,612 | 229,427 |
| Q4 | 709,764 | 765,042 | 806,599 | 812,281 | 662,556 | 375,630 | 510,311 | 335,931 | 228,543 | 214,135 | 510,298 |
| **TOTAL** | **2,727,938** | **2,792,730** | **3,088,080** | **3,169,068** | **2,999,797** | **1,820,940** | **1,627,926** | **1,527,697** | **1,554,486** | **752,117** | **1,189,452** |


**Table 7: Annual Percentage Changes in the Physical Volume of Imported Electricity: January 2008 – December 2018**

| Period | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Jan | 1.7 | (4.0) | 16.9 | 3.3 | 11.7 | (28.8) | (0.8) | (4.0) | (24.1) | (58.9) | 115.2 |
| Feb | 3.1 | (11.7) | 16.8 | 4.2 | 19.7 | (32.5) | 16.8 | (47.5) | 46.6 | (65.8) | 35.7 |
| Mar | 5.3 | (10.6) | 23.5 | 7.6 | (7.4) | (13.3) | (4.0) | (26.4) | 41.9 | (65.7) | 1.9 |
| Apr | 9.1 | (1.9) | 14.0 | 9.5 | (1.3) | (18.3) | (21.4) | (20.4) | 51.3 | (54.7) | 6.1 |
| May | 1.1 | 4.0 | 25.9 | (1.0) | (2.5) | (37.6) | (49.6) | 51.9 | 7.1 | (33.4) | (57.7) |
| Jun | 5.5 | 23.6 | 3.0 | 1.4 | (1.5) | (44.9) | (77.9) | 250.0 | 14.5 | (67.8) | (9.2) |
| Jul | 24.3 | 9.8 | 2.3 | (0.3) | (11.0) | (34.0) | (75.7) | 153.3 | 11.3 | (68.7) | 60.5 |
| Aug | 23.1 | (10.8) | 17.7 | 3.5 | 10.5 | (72.3) | (40.9) | 173.3 | (10.0) | (70.4) | 27.7 |
| Sep | 13.5 | 6.0 | 0.3 | 3.3 | (22.1) | (60.8) | 68.5 | 0.1 | (22.0) | (47.1) | 135.7 |
| Oct | 8.6 | 6.6 | 1.2 | (0.8) | (9.2) | (48.6) | 115.5 | (77.7) | (3.1) | 45.2 | 197.4 |
| Nov | 3.3 | 9.8 | 3.4 | 1.1 | (23.6) | (41.0) | (22.1) | 20.1 | 0.7 | (69.0) | 454.2 |
| Dec | 3.4 | 6.9 | 12.4 | 1.8 | (22.2) | (39.6) | 14.9 | 9.2 | (66.2) | 73.4 | 35.0 |
|  |  |  |  |  |  |  |  |  |  |  |  |
| Q1 | 3.4 | (8.8) | 19.1 | 5.1 | 7.2 | (25.2) | 3.5 | (26.8) | 16.1 | (63.9) | 46.7 |
| Q2 | 5.1 | 8.7 | 13.6 | 2.9 | (1.7) | (34.0) | (46.6) | 33.7 | 24.6 | (52.2) | (23.1) |
| Q3 | 20.2 | 1.6 | 6.2 | 2.1 | (7.4) | (56.5) | (31.8) | 65.7 | (8.5) | (62.6) | 84.1 |
| Q4 | 5.1 | 7.8 | 5.4 | 0.7 | (18.4) | (43.3) | 35.9 | (34.2) | (32.0) | (6.3) | 138.3 |
| **TOTAL** | **8.3** | **2.4** | **10.6** | **2.6** | **(5.3)** | **(39.3)** | **(10.6)** | **(6.2)** | **1.8** | **(51.6)** | **76.9** |

*Note:*
*1. ( ) Denotes negative numbers*

**Table 8: Physical Volume of Electricity Distribution (MWH): January 2008 – December 2018**

| Period | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Jan | 264,322 | 235,916 | 280,552 | 282,990 | 298,912 | 304,746 | 330,053 | 343,471 | 346,553 | 303,277 | 333,481 |
| Feb | 262,893 | 226,055 | 258,477 | 261,873 | 291,017 | 265,432 | 293,098 | 293,950 | 294,278 | 273,215 | 305,212 |
| Mar | 278,361 | 249,524 | 306,157 | 289,801 | 317,538 | 304,979 | 310,300 | 332,498 | 326,533 | 311,011 | 320,957 |
| April | 258,978 | 244,730 | 275,338 | 286,287 | 287,459 | 300,976 | 314,442 | 325,173 | 308,840 | 284,486 | 305,191 |
| May | 276,163 | 272,558 | 322,860 | 293,737 | 310,961 | 309,613 | 337,481 | 336,392 | 318,514 | 298,084 | 349,552 |
| Jun | 274,619 | 287,410 | 306,081 | 302,176 | 323,990 | 288,856 | 354,927 | 344,658 | 327,686 | 316,795 | 337,470 |
| Jul | 300,542 | 308,176 | 309,321 | 303,201 | 326,165 | 319,986 | 357,992 | 340,009 | 324,773 | 346,401 | 274,644 |
| Aug | 294,177 | 269,037 | 298,784 | 292,723 | 307,431 | 305,504 | 344,533 | 309,593 | 338,742 | 350,884 | 258,683 |
| Sep | 273,811 | 284,512 | 283,813 | 277,934 | 297,258 | 296,587 | 333,861 | 306,808 | 331,085 | 321,157 | 264,884 |
| Oct | 290,063 | 296,067 | 304,709 | 292,118 | 317,867 | 155,968 | 338,027 | 361,429 | 357,598 | 317,824 | 322,033 |
| Nov | 279,622 | 289,206 | 292,478 | 297,584 | 323,195 | 327,013 | 341,138 | 329,561 | 329,820 | 332,641 | 321,935 |
| Dec | 261,673 | 273,458 | 306,482 | 292,020 | 301,215 | 322,777 | 334,027 | 350,142 | 324,266 | 316,547 | 319,267 |
| | | | | | | | | | | | |
| Q1 | 805,576 | 711,494 | 845,186 | 834,665 | 907,468 | 875,157 | 933,451 | 969,920 | 967,364 | 887.503 | 959,650 |
| Q2 | 809,759 | 804,698 | 904,279 | 882,199 | 922,411 | 899,445 | 1,006,850 | 1,006,224 | 955,040 | 899,365 | 992,212 |
| Q3 | 868,531 | 861,725 | 891,918 | 873,857 | 930,854 | 922,077 | 1,036,387 | 956,410 | 994,600 | 1,018,442 | 798,212 |
| Q4 | 831,358 | 858,731 | 903,669 | 881,721 | 942,277 | 805,758 | 1,013,192 | 1,041,132 | 1,011,684 | 967,012 | 963,235 |
| **Year** | **3,315,223** | **3,236,648** | **3,545,052** | **3,472,442** | **3,703,010** | **3,502,437** | **3,989,880** | **3,973,685** | **3,928,688** | **3,772,322** | **3,919,347** |

**Table 9: Annual Percentage Changes for the Physical Volume of Electricity Distribution: January 2008 – December 2018**

| Period | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Jan | 0.4 | (10.7) | 18.9 | 0.9 | 5.6 | 2.0 | 8.3 | 4.1 | 0.9 | (12.5) | 10.0 |
| Feb | (0.1) | (14.0) | 14.3 | 1.3 | 11.1 | (8.8) | 10.4 | 0.3 | 0.1 | (7.2) | 11.7 |
| Mar | 1.8 | (10.4) | 22.7 | (5.3) | 9.6 | (4.0) | 1.7 | 7.2 | (1.8) | (4.8) | 3.2 |
| Apr | 4.3 | (5.5) | 12.5 | 4.0 | 0.4 | 4.7 | 4.5 | 3.4 | (5.0) | (7.9) | 5.0 |
| May | 5.5 | (1.3) | 18.5 | (9.0) | 5.9 | (0.4) | 9.0 | (0.3) | 5.3 | (6.4) | 15.0 |
| Jun | 8.0 | 4.7 | 6.5 | (1.3) | 7.2 | (10.8) | 22.9 | (2.9) | (4.9) | (3.3) | 4.4 |
| Jul | 16.0 | 2.5 | 0.4 | (2.0) | 7.6 | (1.9) | 11.9 | (5.0) | (4.5) | 6.7 | (20.7) |
| Aug | 11.8 | (8.5) | 11.1 | (2.0) | 5.0 | (0.6) | 12.8 | (10.1) | 9.4 | 3.6 | (26.3) |
| Sep | 6.0 | 3.9 | (0.2) | (2.1) | 7.0 | (0.2) | 12.6 | (8.1) | 7.9 | (3.0) | (17.5) |
| Oct | 7.9 | 2.1 | 2.9 | (4.1) | 8.8 | (50.9) | 116.7 | 6.9 | (1.1) | (11.1) | 1.3 |
| Nov | 3.5 | 3.4 | 1.1 | 1.7 | 8.6 | 1.2 | 4.3 | (3.4) | 0.1 | 0.9 | (3.2) |
| Dec | 0.7 | 4.5 | 12.1 | (4.7) | 3.1 | 7.2 | 3.5 | 4.8 | (7.4) | (2.4) | 0.9 |
| | | | | | | | | | | | |
| Q1 | 0.7 | (11.7) | 18.8 | (1.2) | 8.7 | (3.6) | 6.7 | 3.9 | (0.3) | (8.3) | 8.1 |
| Q2 | 6.0 | (0.6) | 12.4 | (2.4) | 4.6 | (2.5) | 11.9 | (0.1) | (5.1) | (5.8) | 10.3 |
| Q3 | 11.2 | (0.8) | 3.5 | (2.0) | 6.5 | (0.9) | 12.4 | 7.7 | 4.0 | 2.4 | (21.6) |
| Q4 | 4.1 | 3.3 | 5.2 | (2.4) | 6.9 | (14.5) | 25.7 | 2.8 | (2.8) | (4.4) | (0.4) |
| **Year** | **5.5** | **(2.4)** | **9.5** | **(2.0)** | **6.6** | **(5.4)** | **13.9** | **(0.4)** | **(1.1)** | **(4.0)** | **(8.8)** |

*Note:*
*1. ( ) Denotes negative numbers*

**Table 10: Generation of Electricity (MWH) as a Percentage of Distribution 2008 – December 2018**

| Year\ Utility | Electricity Generation | Imported Electricity | Electricity Distribution | % Contribution of Generated Electricity to Distributed |
|---|---|---|---|---|
| 2008 | 587,286 | 2,727,938 | 3,315,223 | 17.7 |
| 2009 | 443,918 | 2,792,730 | 3,236,648 | 13.7 |
| 2010 | 456,972 | 3,088,080 | 3,545,052 | 12.9 |
| 2011 | 303,374 | 3,169,068 | 3,472,442 | 8.7 |
| 2012 | 703,213 | 2,999,797 | 3,703,010 | 19.0 |
| 2013 | 1,681,497 | 1,820,940 | 3,502,437 | 48.0 |
| 2014 | 2,361,954 | 1,627,925 | 3,989,879 | 59.2 |
| 2015 | 2,445,988 | 1,527,697 | 3,973,685 | 61.6 |
| 2016 | 2,374,202 | 1,554,486 | 3,928,688 | 60.4 |
| 2017 | 3,020,206 | 752,117 | 3,772,322 | 80.1 |
| 2018 | 2,729,895 | 1,189,452 | 3,919,347 | 69.7 |
| | | | | |
| 2013_Q1 | 279,728 | 595,429 | 875,157 | 32.0 |
| Q2 | 371,879 | 527,566 | 899,445 | 41.3 |
| Q3 | 599,762 | 322,315 | 922,077 | 65.0 |
| Q4 | 430,128 | 375,630 | 805,758 | 53.4 |
| 2014_Q1 | 317,245 | 616,206 | 933,451 | 34.0 |
| Q2 | 725,363 | 281,487 | 1,006,850 | 72.0 |
| Q3 | 816,465 | 219,922 | 1,036,387 | 78.8 |
| Q4 | 502,881 | 510,311 | 1,013,192 | 49.6 |
| 2015_Q1 | 518,828 | 451,092 | 969,920 | 53.5 |
| Q2 | 629,976 | 376,248 | 1,006,224 | 62.6 |
| Q3 | 591,983 | 364,427 | 956,410 | 61.9 |
| Q4 | 705,201 | 335,931 | 1,041,132 | 67.7 |
| 2016_Q1 | 443,628 | 523,736 | 967,364 | 45.9 |
| Q2 | 486,188 | 468,852 | 955,040 | 50.9 |
| Q3 | 661,245 | 333,355 | 994,600 | 66.5 |
| Q4 | 783,141 | 228,543 | 1,011,684 | 77.4 |
| 2017_Q1 | 698,451 | 189,052 | 887,503 | 78.7 |
| Q2 | 675,047 | 224,318 | 899,365 | 75.1 |
| Q3 | 893,831 | 124,612 | 1,018,442 | 87.8 |
| Q4 | 752,877 | 214,135 | 967,012 | 77.9 |
| 2018_Q1 | 682,380 | 277,270 | 959,650 | 71.1 |
| Q2 | 819,755 | 172,457 | 992,212 | 82.6 |
| Q3 | 774,822 | 229,427 | 1,004,249 | 77.2 |
| Q4 | 452,938 | 510,298 | 936,236 | 47.0 |

## 2.0 Technical Notes

### 2.1 Background

The generation of electricity in Botswana started in 1985 with a coal fired thermal power station at Morupule operating at a capacity of 132 MWH. Prior to this period, most of Botswana's electricity was imported from South Africa's power utility, Eskom. In 2008 South Africa's electricity demand started to exceed its supply, resulting in the South African government restricting power exports. As a result, Botswana and the entire Southern African region experienced massive power shortages because of the reduced electricity exports from South Africa (http://en.wikipedia.org/wiki/Energy_in_Botswana).

To avert the situation, Botswana Government opted for alternative ways of sourcing electricity for the country; hence the plan to increase local generation of electricity at Morupule Power Station. The Morupule Power A plant of capacity 132 MWH was augmented with the construction of Morupule Power B plant having production capacity of 600 MWH (BPC Annual Report, 2010).

### 2.2  Concepts and formula of the Index of Electricity Generation, Importation and Distribution

The Index of Electricity Generation is a Laspeyres index.  The weighted average for electricity generation equals one because there are no various electricity products.  The index is thus calculated using the formula;

$$I = \frac{\sum R_i * W_i}{\sum W_i}$$

Where;

      **I** is the index
      **R** is the electricity generation relative
      **W** is the weight

The electricity generation relative for the quarter has been calculated by using the formula:

$$R_i = \frac{P_{ic}}{P_{io}} * 100$$

Where $P_{ic}$ is the electricity generation of the current quarter and $P_{i0}$ is the generation of electricity of the base year.

The calculation of the monthly generation indices is based on the volume of electricity units produced.

### 2.3  Base Year

The base year used in this brief is 2013, which is set at 100. The selection of the base period was informed by the availability of relevant data and synchronization of data with other sectors within the industry.