QUARTERLY STATISTICAL BULLETIN ON COMMUNICATIONS IN GHANA

Volume 1 Issue 4

NATIONAL COMMUNICATIONS AUTHORITY

FOURTH QUARTER

OCTOBER - DECEMBER, 2016

Communications for Development

QUARTERLY STATISTICAL BULLETIN ON COMMUNICATIONS IN GHANA

Volume 1 Issue 4

FOURTH QUARTER

OCTOBER – DECEMBER 2016

Published: December 2016
Author: National Communications Authority (NCA)
The bulletin can be downloaded from the website of the
National Communications Authority at **www.nca.org.gh**.

All enquires on the Statistical Bulletin can be sent to:
The Research and Development Division
Phone: +233 (0) 302 776 621
Email: research-development@nca.org.gh
info@nca.org.gh
Website: www.nca.org.gh

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

APPENDIX

Vision

A world-class communications Regulator that facilitates innovative, reliable and sustainable communication solutions to meet stakeholders' expectations.

Mission

Regulate the communications industry in a forward-looking and transparent manner that promotes fair and sustainable competition, stimulates innovation, encourages investment, protects stakeholders' interests and facilitates universal access to quality communications services for national development.

Core Values

- Teamwork
- Accountability
- Consistency
- Trust
- Innovation
- Transparency

Tag Line/Slogan

Communications for Development

INTRODUCTION

This Quarterly Statistical Bulletin on Communications is a reference document containing disaggregated data, industry trends, and anwwalysis of the Ghanaian communications sector. It is intended to enhance open and enriched public discussions on policies for telecom analyst, consumers, academia, policy makers, investors and other stakeholders for decision-making.

This bulletin is the product of the responses from the monthly and quarterly questionnaires sent to the various licencees; notably the mobile network operators, broadband wireless access operators, internet service providers and broadcasting entities.

The publication of this bulletin is consistent with the National Communications Authority's mandate under section 26 (2) (a) of the Electronic Communications Act 2008, Act 775; "to publish the result of research that it carries out or that is carried out on its behalf on its website and in any other manner that it considers appropriate to bring the results to the attention of the public".

LIST OF ABBREVIATIONS

BWA	Broadband Wireless Access
FM	Frequency Modulation
GB	Gigabytes
GH¢	Ghana Cedis
ICT	Information Communication Technology
MB	Megabytes
MNO	Mobile Network Operator
MNP	Mobile Number Portability
MoU	Minutes of Usage
NCA	National Communication Authority
Q1	First Quarter
Q2	Second Quarter
Q3	Third Quarter
Q4	Fourth Quarter
Q-o-Q	Quarter-on-Quarter
SMS	Short Message Service
TV	Television
Y-o-Y	Year-on-year

DEFINITION OF TERMS

Average SMS per subscription - This is calculated by dividing the total volume of SMS for the last month ending the quarter with the total mobile subscription for that month.

BWA Data Usage per Subscription - This is calculated by dividing the total average volume of BWA's traffic for the quarter with the total BWA subscription for that quarter.

Cellular network or mobile network – refers to a communication network where the last link is wireless. The network is distributed over land areas called cells, each served by at least one fixed-location transceiver, known as a cell site or base station. This base station provides the cell with the network coverage, which can be used for transmission of voice, data and others.

Fixed-line network - The term refers to all of the wired networks that are used for voice and data communications. A fixed-line can be seen as a connection to an end-user, by means of a cable, through which they can make phone calls or connect to the Internet.

Minutes of use per subscription - It is calculated by dividing the total average volume of traffic for that quarter with the total average subscription for that quarter

Mobile Data usage per subscription -It is calculated by dividing the total volume of Data traffic for the quarter with the total average mobile data subscription for that quarter.

Mobile Number Portability (MNP) service – This is a service that enables mobile telephone users to switch to a new operator or service provider and still retain their mobile telephone numbers.

Mobile penetration or teledensity – This represents the total number of mobile subscriptions per every 100 inhabitants in a geographical area.

Net subscription addition – It refers to the total number of new mobile network subscribers minus customers that terminate a service with the service provider at a given time.

On-net traffic - refers to phone calls made to a recipient on the same network as the caller.

Off-net traffic - refers to phone calls made to a recipient on a different network.

Quarter-on-quarter – This is a comparison of the quarter under review with the preceding quarter.

Q1 – First Quarter (January – March)
Q2 – Second Quarter (April – June)
Q3 – Third Quarter (July – September)
Q4 – Fourth Quarter (October – December)

Year-on-year – This is a comparison of a period under review (month, quarter etc.) with the same period of the preceding year.

THE COMMUNICATIONS INDUSTRY AT A GLANCE

A1. Service Providers in the Communications Industry

Operator/Service Providers	Number of Authorisation/Licences	Number in Operation
Mobile Network Operators	6	6
Fixed Network Operators	3	2
Broadband Wireless Access	4	3
Television Stations	93	51
FM Stations	481	354
Tower Infrastructure Companies	3	3
International Submarine Cables	5	5
Domestic Fibre Operators	10	10

B1. Total Subscriptions/Connected lines

SUBSCRIPTION	QUARTER-ON-QUARTER			YEAR-ON-YEAR			Units
	Q4 2016	Q3 2016	*Growth (%)*	Q4 2016	Q4 2015	*Growth (%)*	
Mobile Voice Subscription	38.3	37.2	*2.86%*	38.3	35	*9.42%*	Million
Fixed Voice Subscription	251	254	*-1.18%*	251	275	*-8.73%*	Thousand
Mobile Data Subscription	19.6	19.3	*1.60%*	19.6	18	*8.93%*	Million
Fixed Data Subscription	86	87	*-1.15%*	86	75	*14.67%*	Thousand
Broadband Wireless Access	104	102	*1.70%*	104	90	*15.67%*	Thousand

B2. Traffic

TRAFFIC	QUARTER-ON-QUARTER			YEAR-ON-YEAR			Units
	Q4 2016	Q3 2016	*Growth (%)*	Q4 2016	Q4 2015	*Growth (%)*	
Mobile Voice Traffic	13.16	12.78	*2.97%*	13.16	11.62	*13.17%*	Billion
Fixed Voice Traffic	13.87	18.8	*-26.26%*	13.87	26.01	*-46.70%*	Million
Incoming International Traffic	138.5	144.2	*-3.93%*	138.5	171.8	*-19.36%*	Million
Outgoing International Traffic	158.5	178.2	*-11.04%*	158.5	208	*-23.77%*	Million
Mobile Data Traffic (GB)	22.8	20.0	*14.00%*	22.8	10.8	*111.90%*	Million GB
BWA Data Traffic (GB)	3.2	2.9	*10.34%*	3.2	1.9	*68.42%*	Million GB

B3. Penetration Rate

PENETRATION RATE (%)	QUARTER-ON-QUARTER			YEAR-ON-YEAR			Units
	Q4 2016	Q3 2016	*Growth (%)*	Q4 2016	Q4 2015	*Growth (%)*	
Mobile Voice Subscription	136.3	133.3	*2.03*	136.3	127.6	*6.58*	%
Fixed Voice Subscription	0.87	0.89	*-2.25*	0.87	0.97	*-10.31*	%
Mobile Data Subscription	69.8	69.2	*0.87*	69.8	65.7	*6.24*	%
Fixed Data Subscription	0.31	0.32	*-3.13*	0.31	0.27	*14.81*	%
Broadband Wireless Access	0.37	0.37	*1.09*	0.37	0.33	*12.95*	%

1.0 MOBILE NETWORK

This section on mobile network assess metrics such as total number of mobile subscriptions/ connections in Ghana, the net additions to subscriptions, mobile penetration, volume of voice traffic, mobile data subscription and volume of data traffic. It presents the trends of these mobile telecom indicators for five consecutive quarters (fourth quarter of 2015 to fourth quarter of 2016), to reflect the growth in the mobile telecoms landscape in Ghana. The telecoms industry in Ghana has six mobile network operators namely: Airtel, Expresso, Glo, MTN, Tigo and Vodafone.

1.1 Mobile Subscription and Penetration

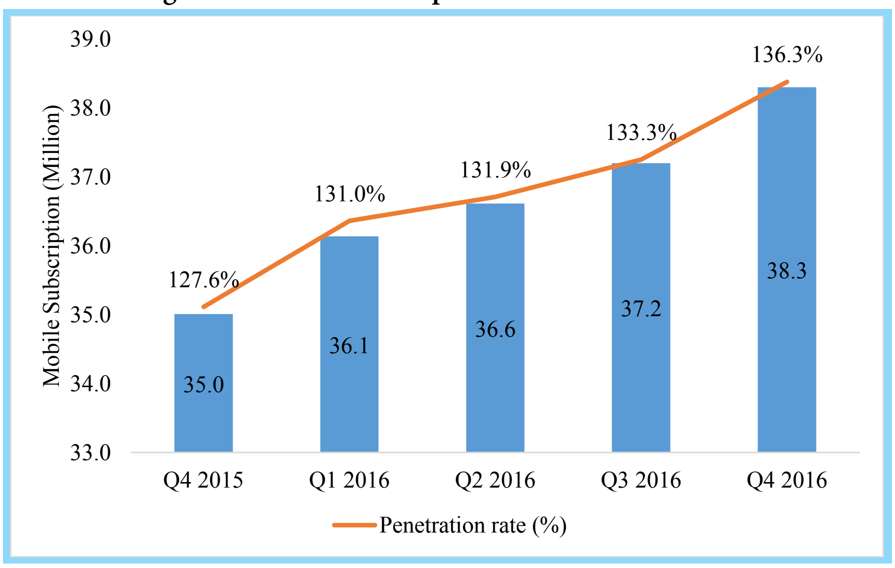
Mobile voice subscription grew by 2.86% quarter-on-quarter, increasing from 37,239,720 at the end of third quarter of 2016 to 38,305,078 during the fourth quarter of 2016 (Table 1). Annual growth in mobile subscription was 9.42% and mobile penetration rate (average subscription per 100 inhabitants) increased to 136.3% at the end of the fourth quarter of 2016 (Figure 1). Mobile net additions during the fourth quarter of 2016 was 1,065,359, an increase of 70.3% compared to the previous quarter.

Table 1: Mobile Subscription and Penetration Rate

Subscription	Q4 2015	Q1 2016	Q2 2016	Q3 2016	Q4 2016
Mobile Subscription	35,008,387	36,138,706	36,613,987	37,239,720	38,305,078
Mobile Subscription Growth rate (%)	*5.22*	*3.23*	*1.32*	*1.71*	*2.86*
Net additions	1,737,947	1,130,319	475,281	625,733	1,065,359
Net additions Growth Rate (%)	*91.5*	*-35.0*	*-58.0*	*31.7*	*70.3*
Population of Ghana	27,429,231	27,594,136	27,760,032	27,926,926	28,094,823
Penetration rate (%)	*127.6*	*131.0*	*131.9*	*133.3*	*136.3*

Source: NCA; Mobile Network Operators, 2016

Figure 1: Mobile Subscription and Penetration Rate



Source: NCA; Mobile Network Operators, 2016

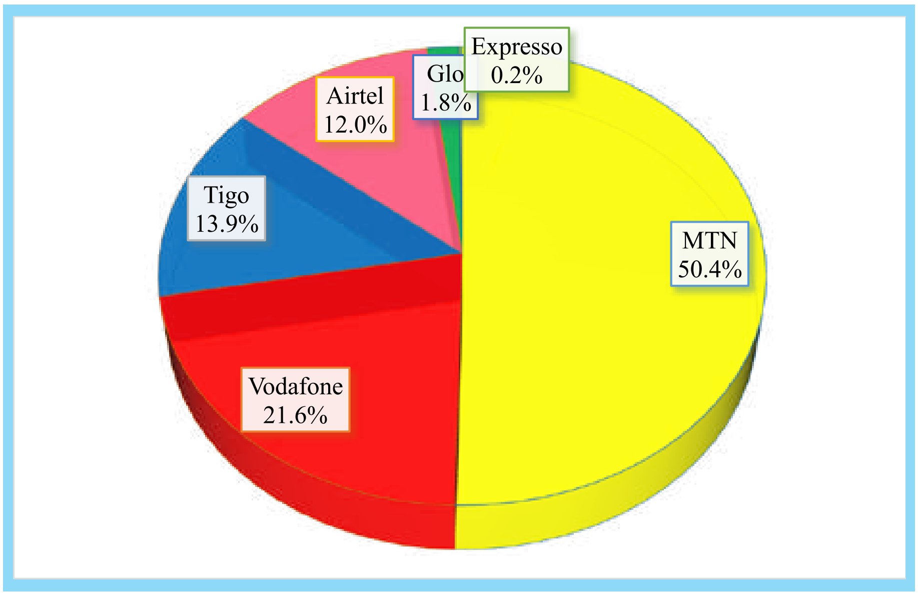
The estimated population is based on the projected annual growth rate of 2.5%, by the Ghana Statistical Service following the 2010 population and housing census.

1.1.1 Mobile Subscription per Operator

MTN Ghana, the largest operator by subscription, increased (6.9%) its subscription from 18,050,144 in the third quarter of 2016 to 19,296,157 at the end of the fourth quarter of 2016 (Table 2). Vodafone, the second largest operator by subscription, expanded its subscriber base by 1.61%, growing from 8,158,527 during the third quarter to 8,289,913 at the end of the fourth quarter of 2016. Aside MTN and Vodafone, the other operators reported a decline in total subscriber base during the fourth quarter of 2016. Tigo's subscription decreased by 1.18% from 5,402,668 in the third quarter of 2016 to 5,339,052 at the end of the fourth quarter. Airtel's subscription reduced from 4,697,653 in the third quarter of 2016 to 4,591,051 at the end of the fourth quarter of 2016 representing 2.27% reduction in subscription. Glo recorded a 16.4% decrease in subscription from 828,162 in the third quarter of 2016 to 695,306 at the end of the fourth quarter of 2016 (Table 2). Expresso had the least subscription of 93,599, indicating a 8.7% decrease from the previous quarter of 102,566.

The market share of MTN increased (4.123.92%) to 50.4% at the end of the fourth quarter of 2016, making MTN the only operator whose market share increased consistently for the past five quarters (Table 2). Vodafone's market share decreased by 0.31.37%, ending the year with 21.6% share of the mobile telecom market subscription. The share of Tigo decreased by 1.374.14% from 14.5% in the previous quarter to 13.9% at the end of 2016. Airtel and Glo decreased by 4.76% and 18.18% respectively bringing their market shares to 12.0% and 1.8% during the fourth quarter of 2016 (Figure 2). Expresso ended the year with a market share of 0.2% representing a decrease of 18.55% from the previous quarter.

Figure 2: Subscription and Market Share (%) per Operator



Source: NCA; Mobile Network Operators, 2016

Table 2: Subscription and Market Share (%) per Operator

Mobile Network Operator		Q4 2015	Q1 2016	Q2 2016	Q3 2016	Q4 2016
MTN	Subscription	16,254,984	17,004,445	17,579,045	18,050,144	19,296,157
	Market Share (%)	*46.4*	*47.1*	*48.0*	*48.5*	*50.4*
Vodafone	Subscription	7,612,059	7,900,534	8,093,710	*8,158,527*	*8,289,913*
	Market Share (%)	*21.7*	*21.9*	*22.1*	*21.9*	*21.6*
Tigo	Subscription	4,850,034	5,062,304	5,261,454	5,402,668	5,339,052
	Market Share (%)	*13.9*	*14.0*	*14.4*	*14.5*	*13.9*
Airtel	Subscription	4,796,645	5,012,239	4,678,736	*4,697,653*	*4,591,051*
	Market Share (%)	*13.7*	*13.9*	*12.8*	*12.6*	*12.0*
Glo	Subscription	1,369,402	1,048,635	897,082	828,162	695,306
	Market Share (%)	*3.9*	*2.9*	*2.5*	2.2	*1.8*
Expresso	Subscription	125,263	110,549	103,960	102,566	*93,599*
	Market Share (%)	*0.4*	*0.3*	*0.3*	*0.3*	*0.2*
Total		35,008,387	36,138,706	36,613,987	37,239,720	38,305,078

Source: NCA; Mobile Network Operators, 2016

1.1.2 Prepaid and Post-paid Mobile Subscription

The mobile market in Ghana is heavily dominated by pre-paid subscribers. At the end of the fourth quarter of 2016, prepaid subscriptions increased from 36.9 million to 37.9 million, representing 99% of the market (Table 3). Post-paid subscription increased marginally from 384,164 in the third quarter of 2016 to 386,455 at the end of the fourth quarter of 2016, representing 0.6% of the market (Table 3).

Table 3: Prepaid and Post-paid Subscription

Subscription		Q4 2015	Q1 2016	Q2 2016	Q3 2016	Q4 2016
Prepaid	Subscription	34,797,888	35,923,390	36,259,719	36,855,555	37,918,623
	Share (%)	*99.4*	*99.4*	*99.0*	*99.0*	*99.0*
Post-paid	Subscription	210,499	215,316	354,268	384,164	386,455
	Share (%)	*0.6*	*0.6*	*1.0*	*1.0*	*1.0*
Total mobile subscription		**35,008,387**	**36,138,706**	**36,613,987**	**37,239,720**	**38,305,078**

Source: NCA; Mobile Network Operators, 2016

1.2 Mobile Voice Traffic (Domestic)

Total volume of mobile voice traffic, as reported by the mobile network operators, increased by 2.97% to 13.16 billion minutes during the fourth quarter of 2016, up from 12.78 billion minutes in the previous quarter (Figure 3). The year-on-year total traffic also increased by 13.17% from 11.62 billion minutes in the fourth quarter of 2015 to 13.16 billion minutes at the end of the fourth quarter of 2016. The festive seasons (Christmas and New Year), and the parliamentary and presidential elections may have contributed to the quarter-on-quarter and year-on-year growth in mobile voice traffic.

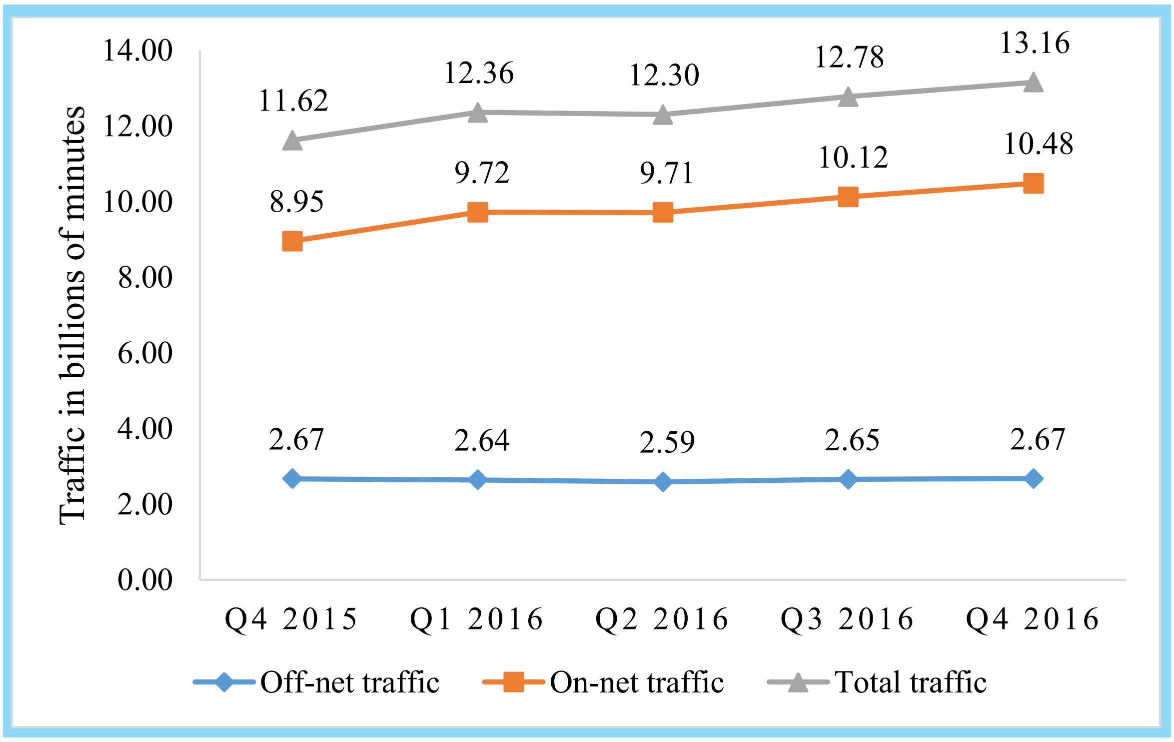
On-net voice traffic accounts for a larger share of the total voice traffic and keeps increasing, compared to the off-net traffic. On-net refers to phone call between subscribers on the same mobile network whereas off-net refers to communication between subscribers of different mobile operators. On-net traffic increased to 10.48 billion minutes during the fourth quarter of 2016, up by 3.56% from 10.12 billion minutes in the previous quarter (Table 4). Year-on-year on-net traffic increased by 17.08% from 8.95 billion minutes in the preceding year 2015. Total off-net traffic expanded marginally (0.72%) quarter-on-quarter, increasing from 2.65 billion minutes to 2.67 billion minutes between the third and fourth quarters of 2016. Year-on-year off-net traffic grew by 0.06% from 2.67 billion minutes a year earlier (Figure 3). The share of off-net traffic to the total voice traffic has been declining consistently for the past five quarters.

Table 4: Mobile Voice Traffic (Domestic)

Traffic	Q4 2015	Q1 2016	Q2 2016	Q3 2016	Q4 2016
Off-net traffic					
Traffic	2,670,224,236	2,639,857,946	2,588,294,623	2,652,712,749	2,671,763,781
Share (%)	*22.97*	*21.36*	*21.04*	*20.76*	*20.31*
Growth (%)	*5.36*	*-1.14*	*-1.95*	*2.49*	*0.72*
On-net traffic					
Traffic	8,954,442,437	9,717,444,820	9,710,683,731	10,122,604,500	10,483,435,828
Share (%)	*77.03*	*78.64*	*78.96*	*79.24*	*79.69*
Growth (%)	*4.37*	*8.52*	*-0.07*	*4.24*	*3.56*
Total traffic	**11,624,666,672**	**12,357,302,766**	**12,298,978,355**	**12,775,317,248**	**13,155,199,609**

Source: NCA; Mobile Network Operators, 2016

Figure 3: Mobile Voice Traffic (Domestic)



Source: NCA; Mobile Network Operators, 2016

1.2.1 Distribution of mobile off-net traffic between mobile and fixed networks

At the end of the fourth quarter of 2016, mobile to mobile voice traffic was 2.66 billion minutes, an increase (0.72%) from 2.64 billion minutes in the third quarter of 2016 (Table 5). Year-on-year off-net mobile to mobile traffic increased marginally (0.29%) from 2.65 billion minutes in the fourth quarter of 2015 to 2.66 billion minutes at the end of the fourth quarter of 2016.

The share of mobile traffic to fixed network has declined over the preceding quarters, lagging below 1% over the period, consistent with the shrinking size of the fixed network.

The quarter-on-quarter mobile to fixed network traffic increased by 1.16%, from 5.88 million minutes in the third to 5.95 million minutes at the end of the fourth quarter of 2016 (Table 5). The year-on-year mobile to fixed traffic also declined by 51.27%, from 12.21 million minutes in the year 2015.

Table 5: Mobile off-net traffic distribution between mobile and fixed networks

Breakdown of Off-net Traffic	Q4 2015	Q1 2016	Q2 2016	Q3 2016	Q4 2016
Mobile to Mobile Networks					
Traffic	2,658,014,083	2,627,568,306	2,577,957,526	2,646,830,836	2,665,813,679
Share (%)	*99.54*	*99.53*	*99.60*	*99.78*	*99.78*
Growth (%)	*5.39*	*-1.15*	*-1.89*	*2.67*	*0.72*
Mobile to Fixed Networks					
Traffic	12,210,153	12,289,640	10,337,098	5,881,912	5,950,102
Share (%)	*0.46*	*0.47*	*0.40*	*0.22*	*0.22*
Growth (%)	*-1.14*	*0.65*	*-15.89*	*-43.10*	*1.16*
Total Off-net Traffic	**2,670,224,236**	**2,639,857,946**	**2,588,294,623**	**2,652,712,748**	**2,671,763,781**

Source: NCA; Mobile Network Operators, 2016

1.2.2 Minutes of Use (MoU)

The Minutes of Use (MoU) per month per subscription increased by 0.5% quarter-on-quarter from 115 minutes in the third quarter of 2016 to 116 minutes at the end of the fourth quarter of 2016 (Table 6). Year-on-year minutes of use also increased by 2.87% from 113 minutes at the end of fourth quarter of 2015. The growth in minutes of use indicate that the average duration for phone call per subscriber increased by 1 minute quarter-on-quarter and 3 minutes' year-on-year respectively (Figure 4).

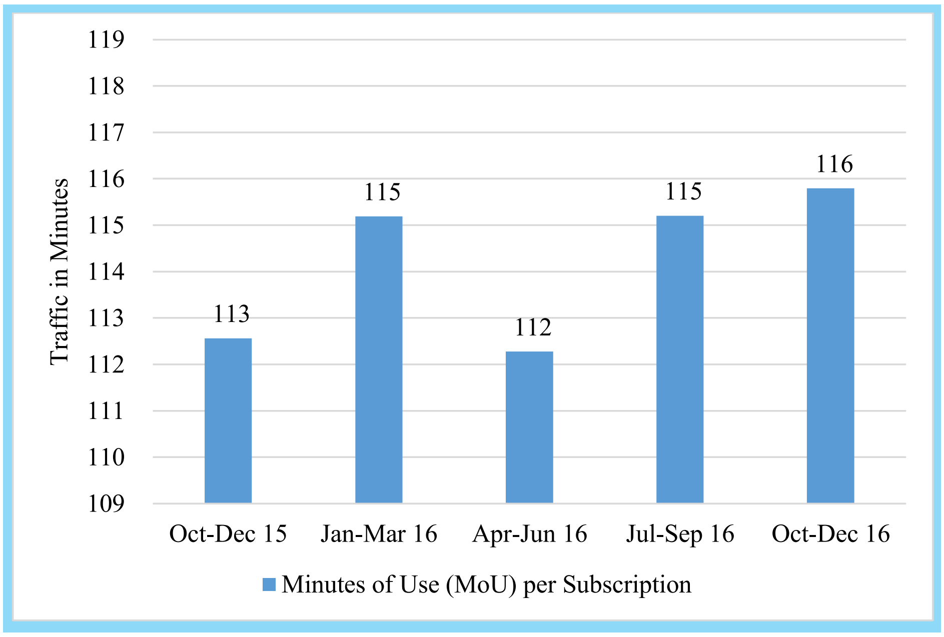
Minutes of use per subscription is calculated by dividing the total average volume of traffic for that quarter with the total average subscription for that quarter

Table 6: Mobile Voice Traffic Minutes of Use (MoU) per Subscription

Traffic	Oct-Dec 15	Jan-Mar 16	Apr-Jun 16	Jul-Sep 16	Oct-Dec 16
Total mobile traffic	3,874,888,891	4,119,100,922	4,099,659,452	4,258,439,083	4,385,066,536
Mobile subscription	34,424,055	35,759,076	36,514,566	36,963,850	37,869,062
Minutes of Use (MoU) per Subscription	113	115	112	115	116
MoU growth rate (%)	*0.0*	*2.3*	*-2.5*	*2.6*	*0.5*

Source: NCA; Mobile Network Operators, 2016

Figure 4: Mobile Voice Traffic Minutes of Use (MoU) per Subscription



Source: NCA; Mobile Network Operators, 2016

1.3 International Traffic

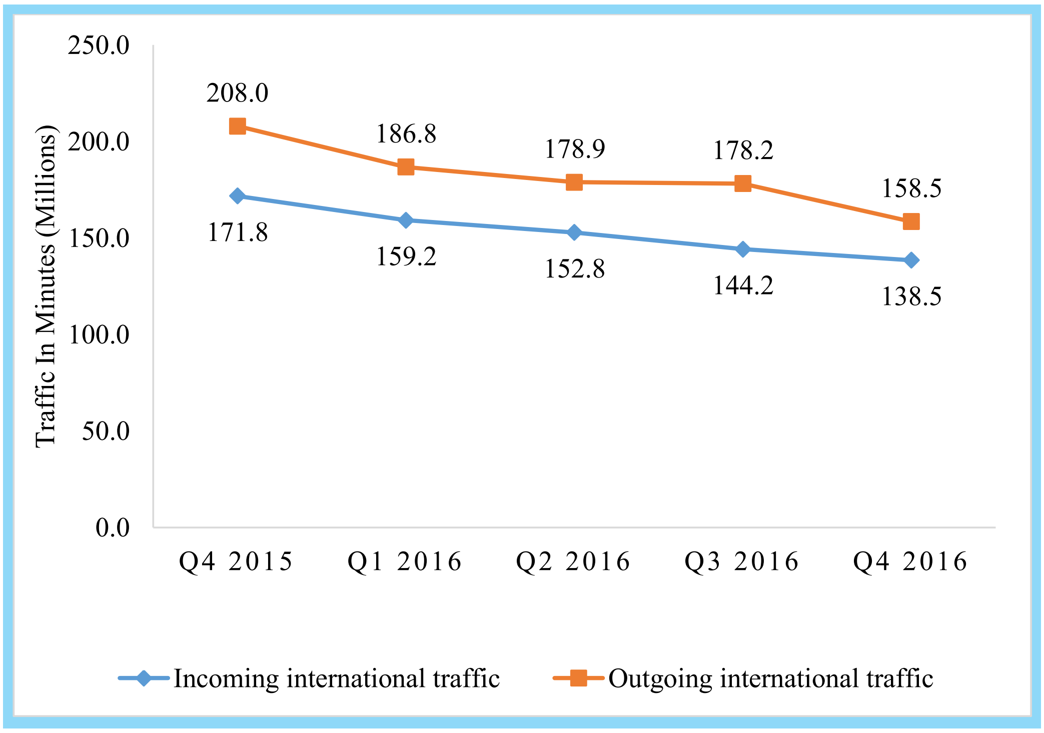
The total volume of incoming and outgoing international traffic declined quarter-on-quarter with a sharp decline (11.04%) in outgoing international traffic than incoming traffic (3.93%). Incoming international traffic reduced (19.4%) year-on-year, declining from 171.7 million minutes in 2015 to 138.5 million minutes in 2016 (Table 7). Outgoing international traffic also decreased (23.8%) year-on-year from 207.95 million minutes in the preceding year to 158.5 million minutes at the end of 2016 (Table 7). Several reasons may contribute to the decline in international traffic, including the competition from over-the-top services.

Table 7: International Traffic

Traffic	Q4 2015	Q1 2016	Q2 2016	Q3 2016	Q4 2016
Incoming international traffic					
Traffic	171,770,961	159,200,257	152,830,342	144,175,704	138,515,521
Growth (%)	*1.90*	*-7.32*	*-4.00*	*-5.66*	*-3.93*
Outgoing international traffic					
Traffic	207,951,234	186,798,787	178,879,037	178,203,087	158,524,688
Growth (%)	*2.66*	*-10.17*	*-4.24*	*-0.38*	*-11.04*

Source: NCA; Mobile Network Operators, 2016

Figure 5: International Traffic



Source: NCA; Mobile Network Operators, 2016

1.4 Short Messages Service (SMS) per Operator

Total volume of messages sent via short messaging services (SMS) dropped (15.9%) from 454.7 million in the third quarter of 2016 to 382.6 million at the end of the fourth quarter of 2016 (Figure 6). Year-on-year volume of SMS grew by 1.4% from 377.4 million in the fourth quarter of 2015 to 382.6 million at the end of the fourth quarter of 2016.

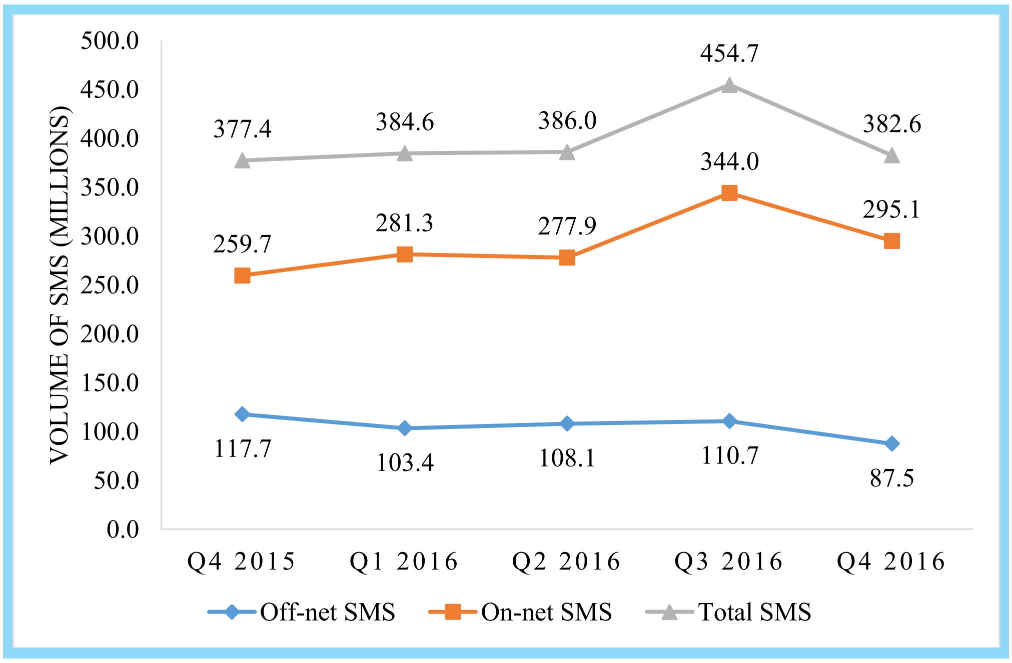
MTN accounted for 44.8% of the total volume of SMS, with an increase in SMS from 168.7 million in the third quarter of 2016 to 171.3 million at the end of the fourth quarter of 2016 (Table 8). Vodafone's total SMS stood at 84.5 million in the fourth quarter of 2016 from 123.7 million in the third quarter of 2016, with a market share of 22.1%. Tigo's SMS decreased from 124.1 million in the third quarter of 2016 to 91.6 million in the fourth quarter of 2016 with a share of 23.9%. Airtel also reported a decrease in the total volume of SMS from 36.0 million in the third quarter to 33.2 million at the end of the fourth quarter of 2016 and a share of 8.7%. Glo had the smallest share of 0.5% with the total number of SMS decreasing from 2.0 million in the third quarter of 2016 to 1.8 million in the fourth quarter of 2016 (Table 8). Expresso did not submit information on SMS to the NCA during the period under review.

Table 8: Total Number of SMS per Mobile Network Operator

Mobile Operators	Q4 2015	Q1 2016	Q2 2016	Q3 2016	Q4 2016
	Off-net SMS				
MTN	33,360,955	34,741,293	36,216,847	41,365,427	38,464,815
Vodafone	24,175,429	23,684,812	25,410,863	27,529,698	9,789,941
Tigo	19,403,734	26,403,487	20,458,520	23,146,290	19,079,594
Airtel	38,586,753	16,431,646	23,994,337	17,008,972	18,703,069
Glo	2,159,848	2,120,708	2,002,469	1,662,244	1,511,808
Expresso	8,577	8,062	-	-	-
Total	**117,695,296**	**103,390,008**	**108,083,036**	**110,712,631**	**87,549,227**
	On-net SMS				
MTN	102,030,573	93,791,420	112,089,090	127,386,287	132,876,086
Vodafone	53,592,693	88,531,025	84,439,040	96,173,719	74,721,854
Tigo	93,728,877	89,484,263	65,019,211	100,986,018	72,610,909
Airtel	9,847,445	9,027,249	16,078,366	19,064,329	14,551,296
Glo	454,662	418,743	290,174	398,718	298,753
Expresso	8,709	-	-	-	-
Total	**259,662,959**	**281,252,700**	**277,915,881**	**344,009,071**	**295,058,898**
	Total SMS				
MTN	135,391,528	128,532,713	148,305,937	168,751,714	171,340,901
Vodafone	77,768,122	112,215,837	109,849,903	123,703,417	84,511,795
Tigo	113,132,611	115,887,750	85,477,731	124,132,308	91,690,503
Airtel	48,434,198	25,458,895	40,072,703	36,073,301	33,254,365
Glo	2,614,510	2,539,451	2,292,643	2,060,962	1,810,561
Expresso	17,286	8,062	-	-	-
Total	**377,358,255**	**384,642,708**	**385,998,917**	**454,721,702**	**382,608,125**

Source: NCA; Mobile Network Operators, 2016

Figure 6: Total Number of SMS

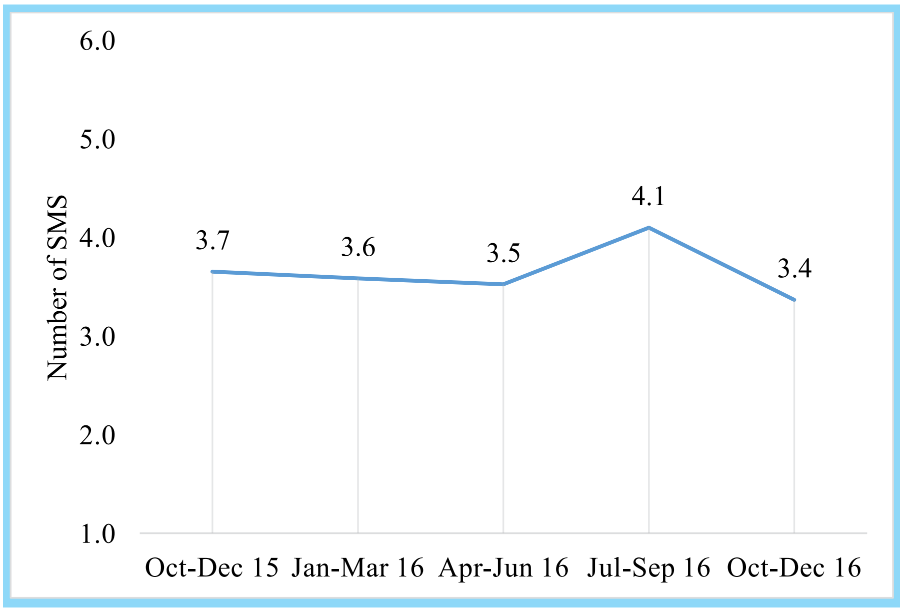


Source: NCA; Mobile Network Operators, 2016

1.4.1 Average SMS per Subscription

Average SMS per subscription per month decreased by 17.87% quarter-on-quarter from an average of 4.1 SMS per subscription in the third quarter of 2016 to an average of 3.4 SMS per subscription at the end of the fourth quarter of 2016 (Figure 7). Year-on-year average SMS per subscription also decreased by 7.83% from 3.7 SMS in the previous year (Figure 7).

Figure 7: Average SMS per Subscription



Source: NCA; Mobile Network Operators, 2016

This is calculated by dividing the total average volume of SMS for the quarter with the total average mobile subscription for that quarterAverage

1.5 Mobile Telecommunications Service Tariffs

During the quarter under review, the average default tariffs for mobile on-net calls and mobile data were up by 1 pesewas each (Table 9). Tariffs for off-net calls, SMS (both on-net and off-net) remained unchanged at the end of the fourth quarter of 2016.

Table 9: Average Tariff per Service (GHp)

Tariff	Q4 2015	Q1 2016	Q2 2016	Q3 2016	Q4 2016
Average on-net mobile tariff (Pesewas)	10	11	11	11	12
Average off-net mobile tariff (Pesewas)	12	13	13	13	13
Average on-net SMS tariff (Pesewas)	5	5	5	6	6
Average off-net SMS tariff (Pesewas)	5	6	6	6	6
Average data/Mb tariff (Pesewas)	11	11	11	12	13

Source: NCA; Mobile Network Operators, 2016

1.6 Mobile Data Subscription and Penetration Rate (%)

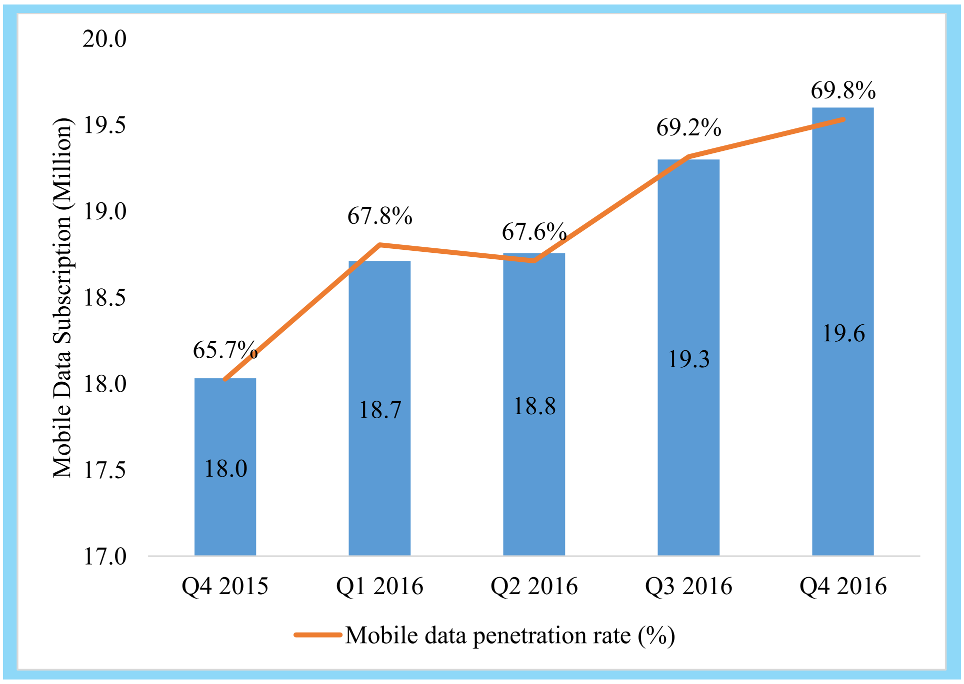
Mobile data subscription at the end of the fourth quarter of 2016 increased (1.6%) to 19.6 million, compared to 19.3 million subscriptions in the third quarter of 2016 (Table 10). Year-on-year data subscription went up (8.9%) from 18.0 million subscriptions in the preceding year. Net additions to mobile data subscription decreased by 46.0% quarter-on-quarter. Mobile data penetration increased from 69.2% in the third quarter of 2016 to 69.8% at the end of the fourth quarter of 2016 (Figure 8).

Table 10: Mobile Data Subscription and Penetration

Subscription	Q4 2015	Q1 2016	Q2 2016	Q3 2016	Q4 2016
Mobile data subscription	18,031,188	18,711,835	18,755,928	19,331,239	19,642,152
Data Subscription Growth Rate (%)	*4.2*	*3.8*	*0.2*	*3.1*	*1.6*
Net Additions	727,293	680,647	44,092	575,311	310,913
Net Additions Growth Rate (%)	*49.1*	*-6.4*	*-93.5*	*1,204.80*	*-46.0*
Population	27,429,231	27,594,136	27,760,032	27,926,926	28,094,823
Mobile data penetration rate (%)	*65.7*	*67.8*	*67.6*	*69.2*	*69.8*

Source: NCA; Mobile Network Operators, 2016

Figure 8: Mobile Data Subscription and Penetration



Source: NCA; Mobile Network Operators, 2016

1.6.1 Mobile Data Prepaid and Post-paid Subscriptions

Mobile data prepaid subscriptions follow similar composition as the voice subscription, with prepaid dominating (99.1%) the industry. Although the share of post-paid mobile data subscription has been increasing over the past five quarters, the share still remains below 1% of the industry (Table 11).

Table 11: Mobile Data Prepaid and Post-paid Subscriptions

Mobile Data Subscription		Q4 2015	Q1 2016	Q2 2016	Q3 2016	Q4 2016
Prepaid	Subscription	17,920,995	18,586,792	18,607,389	19,167,447	19,463,829
	Share (%)	*99.4*	*99.3*	*99.2*	*99.2*	*99.1*
Post-paid	Subscription	110,193	125,043	148,539	163,792	178,323
	Share (%)	*0.6*	*0.7*	*0.8*	*0.8*	*0.9*
Total mobile data subscription		**18,031,188**	**18,711,835**	**18,755,928**	**19,331,239**	**19,642,152**

Source: NCA; Mobile Network Operators, 2016

1.6.2 Mobile Data Subscription per Operator

MTN has the largest share in terms of mobile data subscription with 10.2 million subscriptions (52.1%) followed by Vodafone, with 3.5 million subscriptions (17.7%). Airtel is the third largest operator with 2.9 subscriptions (14.8%), Tigo had total subscription of 2.7 million (13.9%). Glo ended the quarter with subscriptions of 277,372 (1.4%). Expresso had the least mobile data subscriptions of 36,672 (0.2%). Tigo and Airtel had negative quarter-on-quarter net additions to mobile data subscription (Table 12).

Table 12: Mobile Data Subscription per Operator

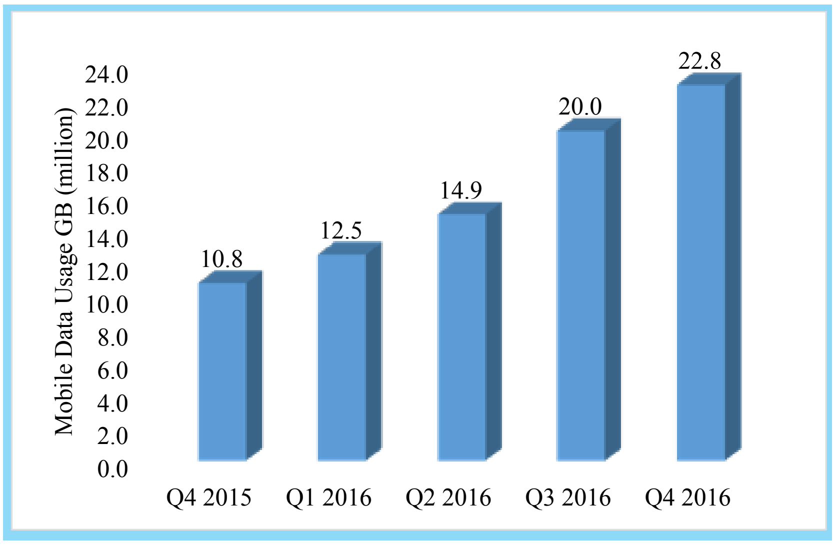
Mobile Network Operator		Q4 2015	Q1 2016	Q2 2016	Q3 2016	Q4 2016
MTN	Subscription	8,634,914	9,066,405	9,369,407	9,745,986	10,226,520
	Market Share (%)	*47.9*	*48.5*	*50.0*	*50.4*	*52.1*
Vodafone	Subscription	3,316,343	3,390,276	3,271,790	*3,314,912*	3,474,090
	Market Share (%)	*18.4*	*18.1*	*17.4*	*17.1*	*17.7*
Tigo	Subscription	2,732,863	2,707,411	2,716,023	2,872,375	2,725,489
	Market Share (%)	*15.2*	*14.5*	*14.5*	*14.9*	*13.9*
Airtel	Subscription	2,879,431	3,177,620	3,058,545	*3,092,700*	2,902,009
	Market Share (%)	*16*	*17*	*16.3*	*16*	*14.8*
Glo	Subscription	419,459	325,987	298,622	265,085	277,372
	Market Share (%)	*2.3*	*1.7*	*1.6*	*1.4*	*1.4*
Expresso	Subscription	48,178	44,136	41,541	*40,181*	36,672
	Market Share (%)	*0.3*	*0.2*	*0.2*	*0.2*	*0.2*
Total		**18,031,188**	**18,711,835**	**18,755,928**	**19,331,239**	**19,605,480**

Source: NCA; Mobile Network Operators, 2016

1.7 Mobile Data Traffic

The telecoms industry in Ghana has witnessed steady growth in mobile data consumption, and this has been facilitated by the upsurge in penetration of smart phones, tablets, smart devices and internet of things. During the fourth quarter of 2016, mobile data traffic grew by 13.94% to 22.8 million gigabytes up from 20.0 million gigabytes in the third quarter of 2016 (Figure 9). Year-on-year mobile data traffic expanded by triple digits (111.90%), from 10.8 million gigabytes of data in fourth quarter of 2015 to 22.8 million gigabytes of data at end of the fourth quarter of 2016 (Figure 9).

Figure 9: Mobile Data Traffic in Millions of Gigabyte (GB)

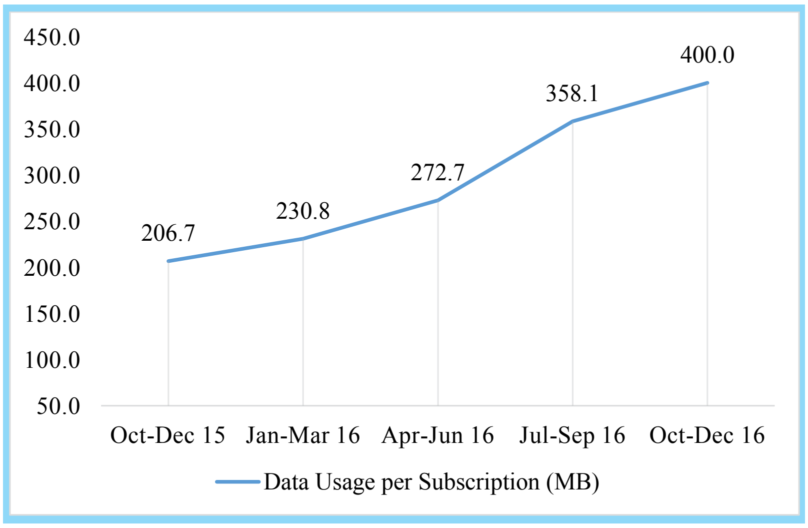


Source: NCA; Mobile Network Operators, 2016

1.7.1 Mobile Data Usage per Subscription (MB)

The average mobile data usage per subscription per month increased (8.12%) from 358.1 megabytes in the third quarter of 2016 to 400.0 megabytes at the end of the fourth quarter of 2016. Year-on-year data usage per subscription increased significantly (80.23%) from 206.7 megabytes per subscription in the year earlier (Figure 10).

Figure 10: Mobile Data Usage per Subscription (MB)



1.7.2 Mobile Data Traffic (GB) per Operator

MTN maintained the top spot in terms of data traffic, generating 11.18 million gigabytes (49.0%) of data traffic during the fourth quarter of 2016 (Table 13). Vodafone moved to the second position, up from the third spot during the previous quarter by increasing its volume of traffic to 5.21 million gigabytes (22.81%). Airtel lost its second position to Vodafone, becoming the third largest mobile data carrier with 3.63 million gigabytes of data and market share of 15.9%. Tigo accounted for 1.74 million gigabytes of the total data usage (7.6%) and Glo had 1.07 million gigabytes of data usage representing 4.7% of total data usage (Table 13). Expresso did not submit any information on mobile data traffic for the past five consecutive quarters.

Table 13: Mobile Data Traffic (GB) per Operator

Mobile Data usage per subscription is calculated by dividing the total average volume of Data traffic for the quarter with the total average mobile data subscription for that quarter.

Mobile Operator	Data Usage (GB)	Q4 2015	Q1 2016	Q2 2016	Q3 2016	Q4 2016
MTN	Data Usage (GB)	3,828,998.22	4,606,691.59	6,187,603.59	9,121,837.07	11,183,758.56
	Market Share (%)	*35.6*	*36.9*	*41.4*	*45.5*	*49.0*
Vodafone	Data Usage (GB)	3,606,482.64	3,856,198.78	3,905,873.86	4,405,475.22	5,206,566.90
	Market Share (%)	*33.5*	*30.8*	*26.1*	*22.0*	*22.81*
Tigo	*Data Usage (GB)*	959,476.94	1,126,398.71	1,310,040.32	1,540,356.98	1,741,034.17
	Market Share (%)	*8.9*	*9.0*	*8.8*	*7.7*	*7.6*
Airtel	*Data Usage (GB)*	2,361,873.44	2,879,226.50	3,448,326.87	4,531,206.12	3,625,037.03
	Market Share (%)	*21.9*	*23*	*23.1*	*22.6*	*15.9*
Glo	*Data Usage (GB)*	13,853.12	32,624.35	89,151.17	432,360.56	1,066,709.23
	Market Share (%)	*0.1*	*0.3*	*0.6*	*2.2*	*4.7*
Total		**10,770,684.36**	**12,501,139.93**	**14,940,995.81**	**20,031,235.95**	**22,823,105.89**

1.8 Mobile Number Portability (MNP)

Promoting and sustaining competition in the communications industry is at the core of the regulatory policies of the National Communications Authority (NCA). The mobile number portability (MNP) is one of such policies, introduced by the Authority to stimulate competition among mobile wireless operators and provide the flexibility for subscribers to switch among service providers.

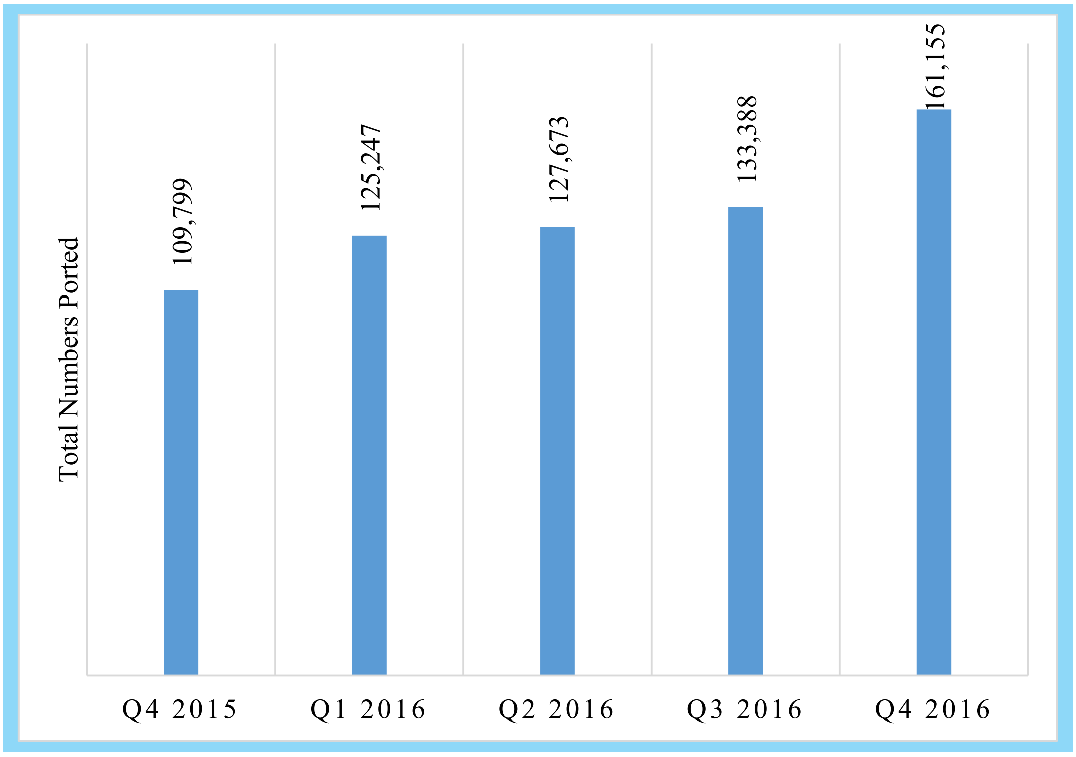
This sub-section assesses the total number ported averagely in each quarter. It also accounts for the quarter-on-quarter and year-on-year growth in mobile number portability in Ghana. Mobile number portability in Ghana started in July 2011, as such, the calendar year for the MNP begins in July and ends in June. The first quarter is from July to September, Second quarter comprise October to December, third quarter spans from January to March and April to June is the fourth quarter.

The number of mobile numbers ported increased (20.8%) during the quarter under review, from 133,388 in the previous quarter to 161,155 in the fourth quarter of 2016 (Table 14). Similarly, the number of mobile numbers ported increased from 109,799 in the fourth quarter of 2015 to 161,155 at the end of the fourth quarter of 2016, representing a 46.8% increment year-on-year. The total number ported during the period under review represents 0.42% of the total mobile voice subscriptions for the same period.

Table 14: Mobile Number Portability and Growth Rate (%)

Porting	Q4 2015	Q1 2016	Q2 2016	Q3 2016	Q4 2016
Total Number Ported	109,799	125,247	127,673	133,388	161,155
Growth Rate (%)	*-16.5*	*14.1*	*1.9*	*4.5*	*20.8*

Figure 11: Mobile Number Portability


Total Numbers Ported
109,799
125,247
127,673
133,388
161,155
Q4 2015
Q1 2016
Q2 2016
Q3 2016
Q4 2016

2.0 BROADBAND WIRELESS ACCESS (BWA)

There are three operators offering broadband wireless access service in Ghana, namely; Surfline, Broadband Home (BBH, formerly Zipnet) and Blu Telecommunications. These operators offer only data services.

2.1 BWA Subscription and Penetration

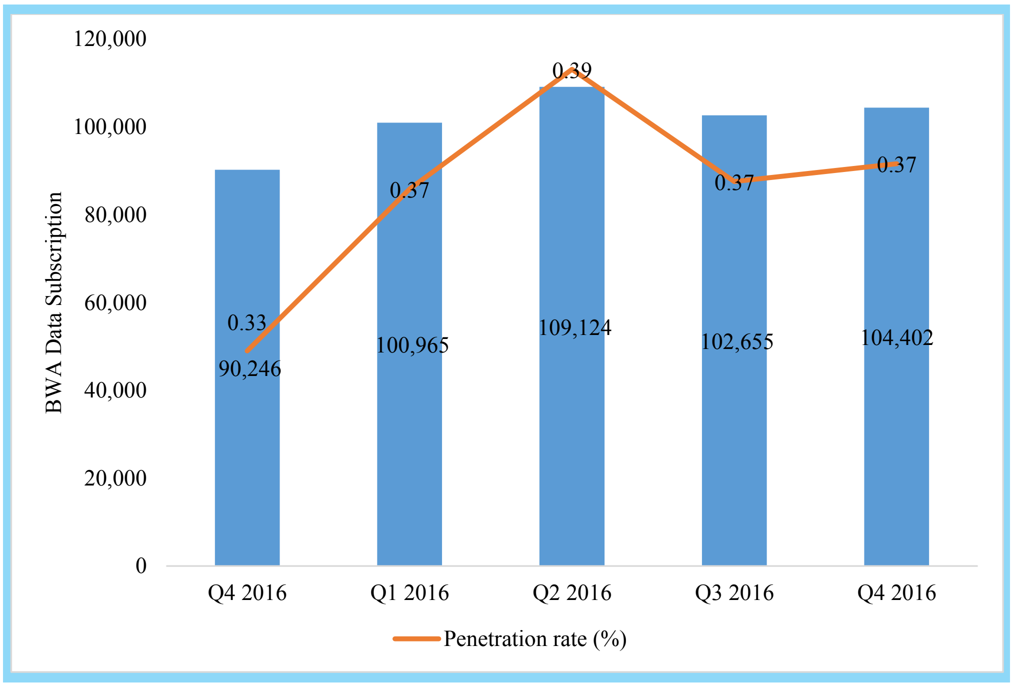
Total number of BWA subscriptions as reported by the three operators, increased (1.7%) from 102,655 in the third quarter of 2016 to 104,402 at the end of the fourth quarter of 2016 (Table 15). The year-on-year subscription, increased by 15.69% from 90,246 in the fourth quarter of 2015. Penetration rate for Broadband Wireless Access remained at 0.37% at the end of the fourth quarter of 2016 (Figure 12).

Table 15: BWA Data Subscription and Penetration

BWA Operator	Q4 2016	Q1 2016	Q2 2016	Q3 2016	Q4 2016
Subscription	90,246	100,965	109,124	102,655	104,402
Growth rate (%)	*8.3*	*1.0*	*7.1*	*-5.93*	*1.70*
Net Additions	-465	10,719	8,159	-6,469	1,747
Population	27,429,231	27,594,136	27,760,032	27,926,926	28,094,823
Penetration rate (%)	*0.33*	*0.37*	*0.39*	*0.37*	*0.37*

Source: NCA; Broadband Wireless Access Operators, 2016

Figure 12: BWA Data Subscription and Penetration Rate



Source: NCA; Broadband Wireless Access Operators, 2016

2.1.1 *Subscription per Broadband Wireless Access (BWA) Operator*

During the fourth quarter of 2016, Surfline increased its subscription base approximately 2.5% (1,854) to retain its position as the market leader over the past five quarters with a market share of 73.7% and 76,919 subscriptions (Table 16). Aside Surfline, the remaining two operators, BBH and Blu telecoms experienced a decline in their subscription. Broadband Home (formerly Zipnet) subscription declined by 0.1% with a corresponding decline in market share to 25.3%, and Blu Telecommunications subscription declined by 7.4% (Table 16).

Table 16: Subscription per Broadband Wireless Access (BWA) Operator

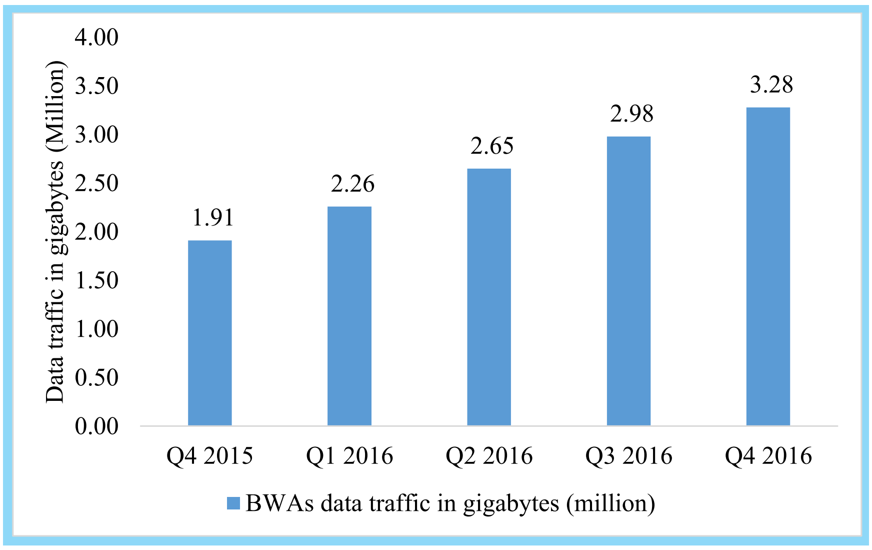
BWA operator		Q4 2016	Q1 2016	Q2 2016	Q3 2016	Q4 2016
Surfline	Subscription	61,980	72,903	81325	75,065	76,919
	Market share (%)	*68.7*	*72.2*	*74.5*	*73.1*	*73.7*
BBH	Subscription	26,786	26,666	26,536	26,423	26,402
	Market share (%)	*29.7*	*26.4*	*24.3*	*25.7*	*25.3*
BLU	Subscription	1,480	1,396	1,263	1,167	1,081
	Market share (%)	*1.6*	*1.4*	*1.2*	*1.1*	*1.0*
Industry total		**90,246**	**100,965**	**109,124**	**102,655**	**104,402**

Source: NCA; Broadband Wireless Access Operators, 2016

2.2 Broadband Wireless Access (BWA) Volume of Data Traffic

Growth in broadband data traffic has been sustained for the past five quarters. The increase in broadband data usage is desirable because it has positive impact on economic growth. Data traffic increased by 10.2% quarter-on-quarter from 2.9 million gigabytes of data in the third quarter of 2016 to 3.28 million gigabytes in the fourth quarter of 2016 (Figure 13). Year-on-year data traffic also increased (71.2%) from 1.91 million gigabytes of data in the previous year to 3.28 million gigabytes of data at the end of 2016 (Figure 13).

Figure 13: BWA Data Usage in Gigabytes (millions)



Source: NCA; Broadband Wireless Access Operators, 2016

2.2.1 *Volume of Broadband Data Traffic per Operator*

During the fourth quarter of 2016, Surfline's total volume of data traffic was 2,902,870 gigabytes, representing 88.5% of the total volume of data generated by all the three BWA's (Table 17). BBH generated the second highest volume of data traffic of 271,931 gigabytes (8.3%). The total volume of data generated by Blu increased from 104,983 to 105,556 gigabytes of data (3.2%).

Table 17: Data Traffic (GB) per Broadband Wireless Access (BWA) Operator

BWA Operator		Q4 2015	Q1 2016	Q2 2016	Q3 2016	Q4 2016
Surfline	Data usage (GB)	1,590,405	1,851,102	2,253,167	2,564,837	2,902,870
	Market share (%)	*83.2*	*81.9*	*85.1*	*86.2*	*88.5*
BBH	Data usage (GB)	200,494	280,747	291,929	306,864	271,931
	Market share (%)	*10.5*	*12.4*	*11.0*	*10.3*	*8.3*
BLU	Data usage (GB)	120,616	127,966	103,879	104,983	105,556
	Market share (%)	*6.3*	*5.7*	*3.9*	*3.5*	*3.2*
Industry Total (GB)		**1,911,516**	**2,259,815**	**2,648,975**	**2,976,684**	**3,280,357**

Source: NCA; Broadband Wireless Access Operators, 2016

2.2.2 *Monthly Data Usage per BWA subscription*

Data usage per subscription per month increased by 5.38% from 10.5 gigabytes in the third quarter of 2016 to 10.0 gigabytes at the end of the fourth of 2016 (Table 18). Year-on-year data usage per subscription also increased by 36.34% from 7.7 gigabytes in the fourth quarter of 2015 to 10.5 at the end of fourth quarter of 2016.

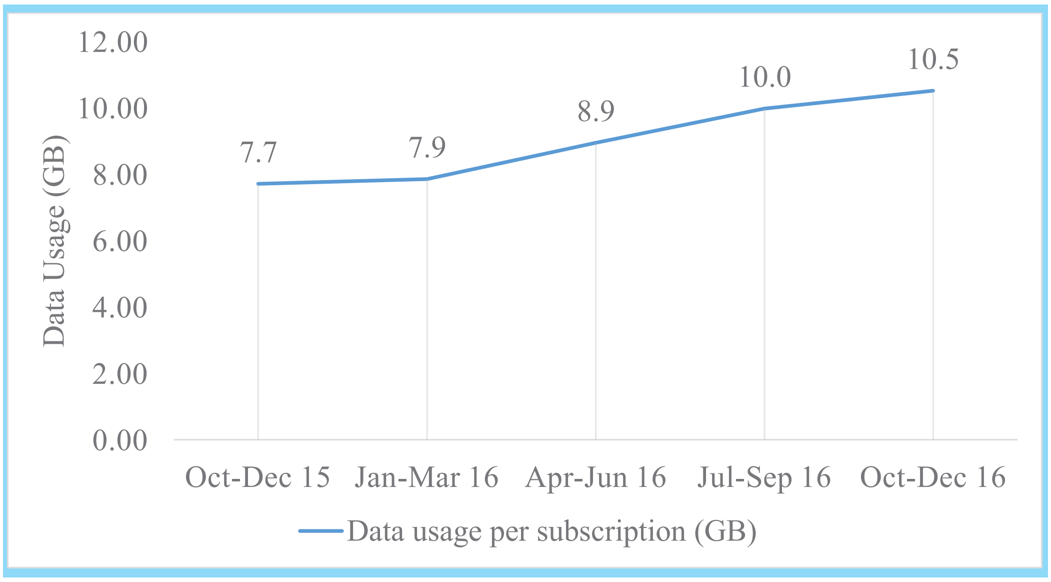
Table 18: Data Usage per BWA Subscription (GB)

BWA Operator	Oct-Dec 15	Jan-Mar 16	Apr-Jun 16	Jul-Sep 16	Oct-Dec 16
Volume of data traffic	637,172	753,272	882,992	992,228	1,093,452
Subscription	82,607	95,874	98,705	99,422	103,976
Data usage per subscription (GB)	7.7	7.9	8.9	10.0	10.5
Data usage per subscription(GB) Growth rate (%)	*-2.29*	*1.86*	*13.86*	*11.56*	*5.38*

Source: NCA; Broadband Wireless Access Operators, 2016

BWA data usage per subscription is calculated by dividing the total average volume of BWA's traffic for the quarter with the total average BWA subscription for that quarter

Figure 14: Data Usage per BWA Subscription (GB)

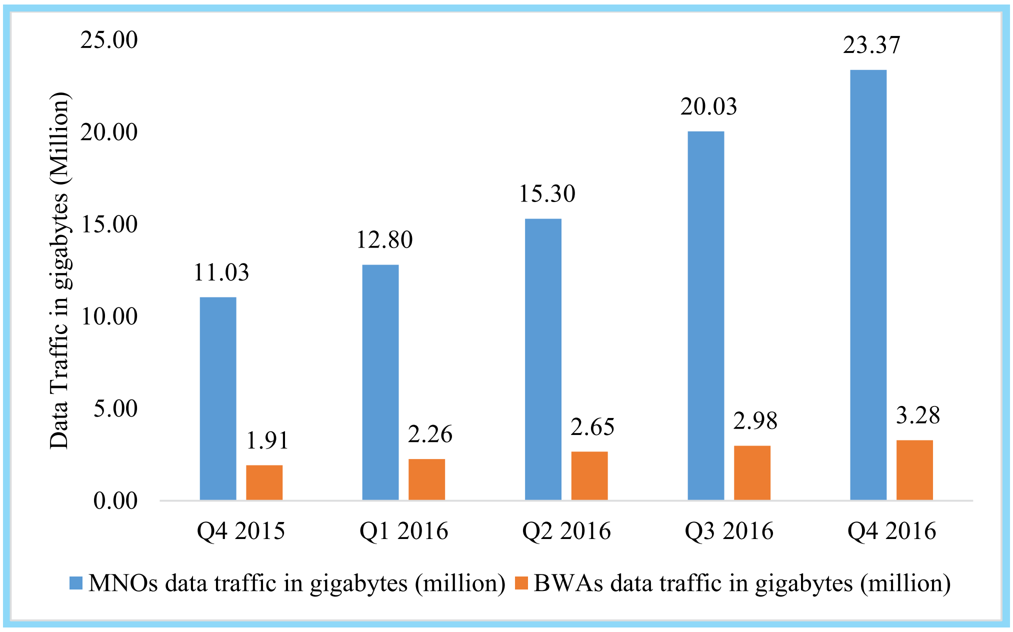


Source: NCA; Broadband Wireless Access Operators, 2016

2.3 Monthly Data Traffic for MNOs Compared to BWAs

Data traffic by both Mobile Network Operators (MNO) and Broadband Wireless Access (BWA) operators showed positive growth over the past five quarters. MNOs total data traffic increased to 23.37 million gigabytes at the end of the fourth quarter of 2016 from 11.03 million gigabytes in the fourth quarter of 2015 whiles BWA operators traffic increased to 3.28 million gigabytes of data at the end of the fourth quarter of 2016 from 1.91 million gigabytes of data in the fourth quarter of 2016 (Figure 15).

Figure 15: Data Traffic for MNO's and BWA's



Source: NCA; MNO's; BWA's, 2016

3.0 FIXED NETWORK

This section assesses the performance of the fixed telephone industry in Ghana over the past one year. Three (3) operators namely Vodafone, Airtel and MTN have been licenced by the National Communications Authority to provide fixed telephone services in Ghana. However, MTN is yet to commence commercial fixed line operation in Ghana. This section therefore covers only Vodafone and Airtel fixed line services.

3.1 Fixed Network Subscription and Penetration

Vodafone is the largest fixed line operator by subscription in Ghana with a market share of about 97.0% whiles Airtel has 3.0% of the total market share.

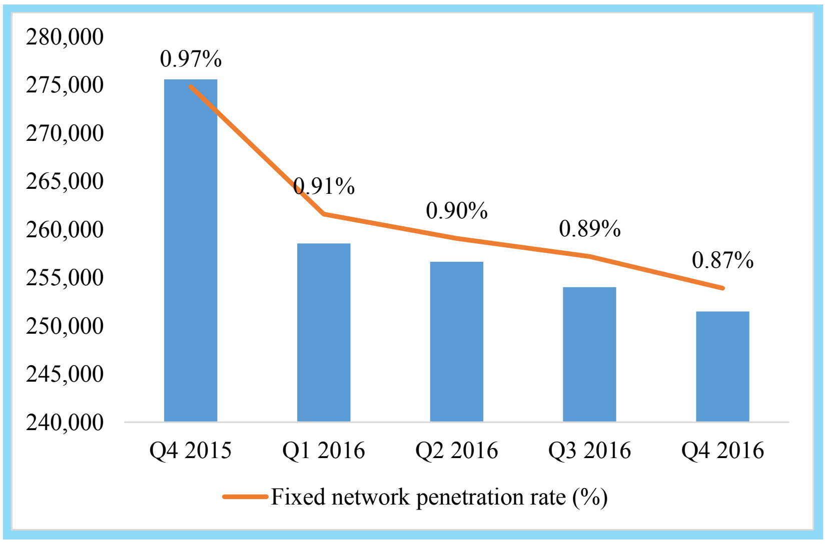
The growth in total fixed line subscription as reported by the two operators continued to decline. The total number of fixed line subscriptions declined by 8.7% year-on-year from 275,570 at the end of 2015 to 251,490 subscriptions at the end of 2016 (Table 19). Also in the same period, fixed line penetration rate declined from 1% to 0.87%.

Table 19: Fixed Network Subscription and Penetration

Fixed Operator	Subscription	Q4 2015	Q1 2016	Q2 2016	Q3 2016	Q4 2016
Vodafone	Subscription	267,161	250,546	248,536	246,425	244,299
	Market share (%)	*96.9*	*96.9*	*96.8*	97.0	*97.1*
Airtel	Subscription	8,409	7,990	8,117	7,596	7,191
	Market share (%)	*3.1*	*3.1*	*3.2*	3.0	*2.9*
Total industry subscription		**275,570**	**258,536**	**256,653**	**254,021**	**251,490**
Population of Ghana		27,429,231	27,594,136	27,760,032	27,815,552	28,094,823
Fixed network penetration rate (%)		*1.00*	*0.94*	*0.92*	*0.91*	*0.87*

Source: NCA; Fixed Network Operators, 2016

Figure 16: Fixed Network Subscription and Penetration Rate



Source: NCA; Fixed Network Operators, 2016

3.2 Fixed Network Traffic

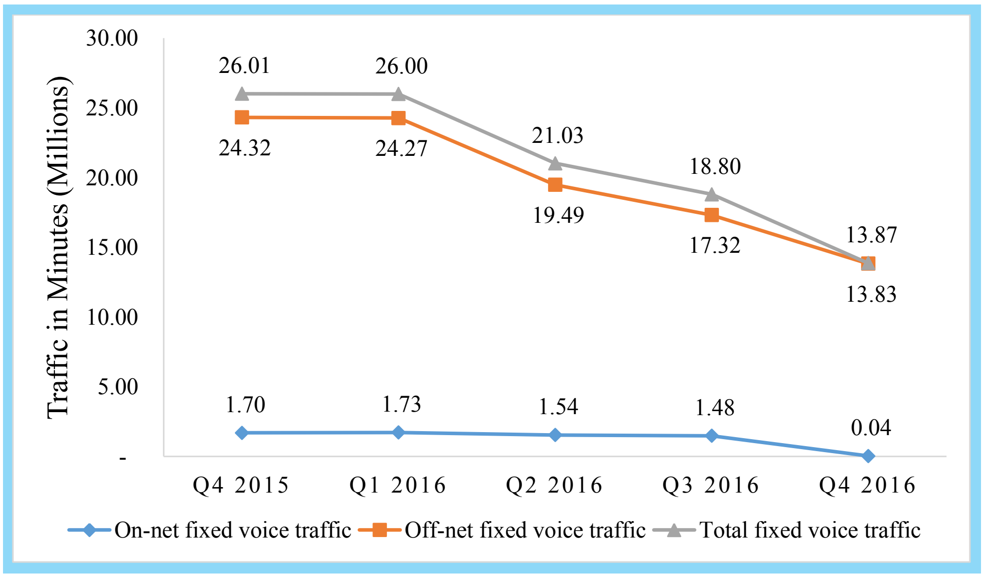
Total volume of fixed network traffic decreased from 26.01 million minutes to 13.87 million minutes, representing 46.7% decline year-on-year (Table 20). Vodafone did not submit any information to NCA on on-net traffic for fixed network during the fourth quarter of 2016.

Table 20: Fixed Network Volume of Traffic in Minutes

Traffic	Q4 2015	Q1 2016	Q2 2016	Q3 2016	Q4 2016
On-net fixed voice traffic	1,696,416	1,726,187	1,542,355	1,482,483	36,455
Off-net fixed voice traffic	24,318,335	24,272,057	19,487,240	17,321,284	13,830,301
Total fixed voice traffic	**26,014,751**	**25,998,244**	**21,029,595**	**18,803,767**	**13,866,756**

Source: NCA; Fixed Network Operators, 2016

Figure 17: Fixed Network Volume of Traffic in Minutes



Source: NCA; Fixed Network Operators, 2016

3.2.1 *Distribution of fixed off-net traffic between mobile and fixed networks*

Fixed to mobile networks traffic reduced by 17.97% from 16.75 million minutes in the third quarter of 2016 to 13.74 million minutes of traffic at the end of the fourth quarter of 2016. Year-on-year traffic also went down by 43.28% from 24.23 million minutes in 2015 to 13.74 million minutes in 2016 (Table 21).

Calls between fixed networks decreased from 566,597 minutes in the third quarter of 2016 to 87,005 minutes at the end of the fourth quarter of 2016 representing 84.64% decrease. Year-on-year fixed to fixed traffic decreased by 0.67% from 87,591 minutes in the fourth quarter of 2015.

Table 21: Distribution fixed off-net traffic between mobile and fixed networks

Breakdown of Fixed Traffic	Q4 2015	Q1 2016	Q2 2016	Q3 2016	Q4 2016
Fixed to Mobile Networks					
Traffic	24,230,744	24,184,407	19,394,046	16,754,687	13,743,296
share (%)	*99.64*	*99.64*	*99.52*	*96.73*	*99.37*
Growth (%)	*-5.54*	*-0.19*	*-19.81*	*-13.61*	*-17.97*
Fixed to Fixed Networks					
Traffic	87,591	87,650	93,193	566,597	87,005
share (%)	*0.36*	*0.36*	*0.48*	*3.27*	*0.63*
Growth (%)	*-6.77*	*0.07*	*6.32*	*507.98*	*-84.64*
Total Off-net Traffic	**24,318,335**	**24,272,057**	**19,487,240**	**17,321,284**	**13,830,301**

Source: NCA; Fixed Network Operators, 2016

3.2.2 Fixed Networks Volume of Traffic per Operator (minutes)

On-net traffic for Airtel decreased by 1.2% from 36,889 minutes in the third quarter of 2016 to 36,455 minutes in the fourth quarter of 2016. There was however, an increase (46.9%) in on-net traffic from 24,821 thousand minutes to 36,455 thousand minutes' year-on-year (Table 22). Vodafone did not submit any information to NCA on on-net traffic for fixed network during the fourth quarter of 2016.

Vodafone off-net traffic decreased by 5.4% from 12.72 million minutes in the third quarter of 2016 to 12.04 million minutes in the third quarter of 2016. Year-on-year Vodafone off-net traffic also decreased by 47.0%% from 22.71 million minutes in the third quarter of 2015 to 12.04 million minutes in the fourth quarter of 2016 (Table 22). Off-net traffic of Airtel decreased (61.1%) from 4.60 million minutes in the third quarter of 2016 to 1.79 million in the fourth quarter of 2016 (Table 22). Year-on-year off-net however increased (11.6%) from 1.60 million minutes' in the fourth quarter of 2015 to 1.79 million minutes at the end of the fourth quarter of 2016.

Table 22: Fixed Networks Volume of Traffic per Operator

Fixed network operator	Traffic	Q4 2015	Q1 2016	Q2 2016	Q3 2016	Q4 2016
	On-net traffic					
Vodafone	On-net traffic	1,671,595	1,684,219	1,494,630	1,445,594	-
	Market share (%)	*98.5*	*97.6*	*96.9*	*97.5*	*0.0*
Airtel	On-net traffic	24,821	41,968	47,725	36,889	36,455
	Market share (%)	*1.5*	*2.4*	*3.1*	*2.5*	*100.0*
Total on-net traffic		**1,696,416**	**1,726,187**	**1,542,355**	**1,482,483**	**36,455**
	Off-net traffic					
Vodafone	Off-net traffic	22,714,957	22,522,176	17,488,864	12,724,955	12,040,453
	Market share (%)	*93.4*	*92.8*	*89.7*	*73.5*	*87.1*
Airtel	Off-net traffic	1,603,378	1,749,881	1,998,376	4,596,329	1,789,847
	Market share (%)	*6.6*	*7.2*	*10.3*	*26.5*	*12.9*
Total off-net traffic		**24,318,335**	**24,272,057**	**19,487,240**	**17,321,284**	**13,830,301**

	Total traffic					
Vodafone	Total traffic	24,386,552	24,206,396	18,983,494	14,170,550	12,040,453
	Market share (%)	*93.7*	*93.1*	*90.3*	*75.4*	*0.0*
Airtel	Total traffic	1,628,199	1,791,849	2,046,101	4,633,218	1,826,302
	Market share (%)	*6.3*	*6.9*	*9.7*	*24.6*	*13.2*
Total fixed network traffic		**26,014,751**	**25,998,245**	**21,029,595**	**18,803,768**	**13,866,756**

Source: NCA; Fixed Network Operators, 2016

3.3 Fixed Network Minutes of Use

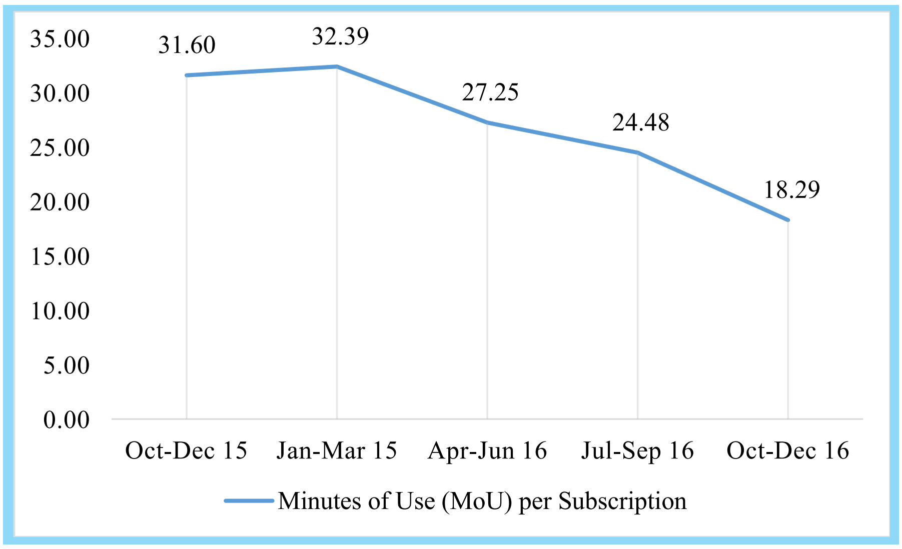
Fixed network minutes of use per month decreased (25.3%) from 24.48 minutes in the third quarter of 2016 to 18.29 minutes at the end of the fourth quarter of 2016 (Figure 18). Year-on-year minutes of use decreased by 42.12% from 31.60 minutes in the fourth quarter of 2015 to 18.29 minutes at the end of the fourth quarter of 2016.

Table 23: Fixed Network Minute of Use per Subscription

Traffic	Oct-Dec 15	Jan-Mar 15	Apr-Jun 16	Jul-Sep 16	Oct-Dec 16
Total Fixed Voice Traffic	8,671,584	8,666,082	7,009,865	6,267,923	4,622,252
Subscription	274,430	267,593	257,215	256,037	252,737
Minutes of Use per Subscription (MoU)	31.60	32.39	27.25	24.48	18.29
Minutes of Use per Subscription (MoU) Growth (%)	*-8.1*	*2.5*	*-15.8*	*-10.2*	*-25.3*

Source: NCA; Fixed Network Operators, 2016

Figure 18: Fixed Network Minute of Use



Source: NCA; Fixed Network Operators, 2016

Fixed Network Minutes of use per subscription is calculated by dividing the total average volume of traffic for the quarter with the total average Fixed subscription for that quarter

3.4 Fixed Data Subscription and Penetration

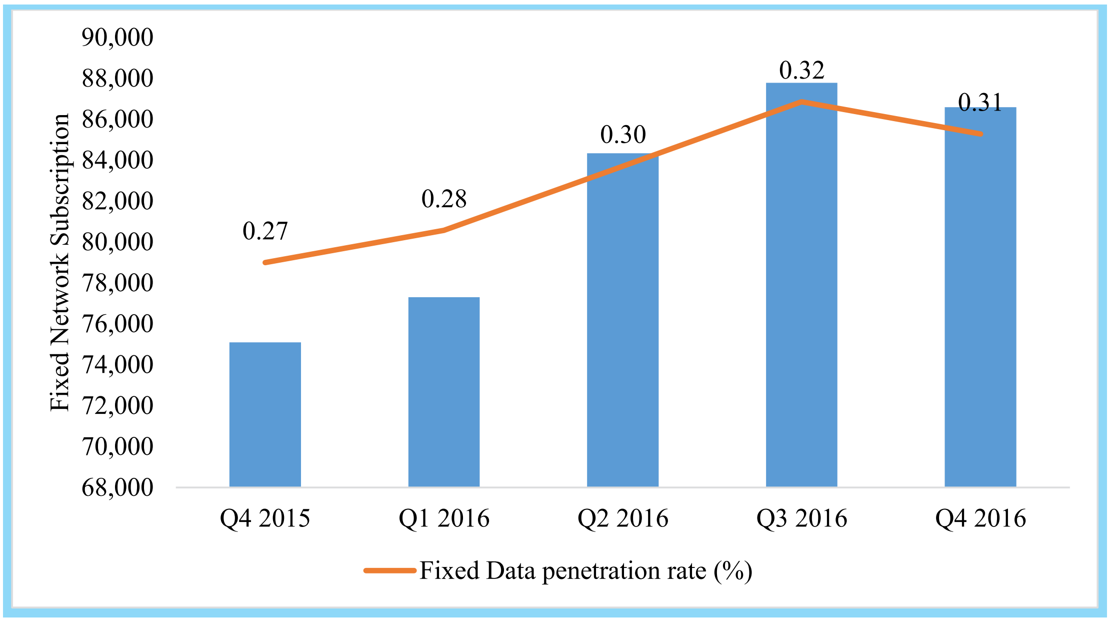
Total fixed data subscription decreased (1.4%) from 87,789 at the end of the third quarter of 2016 to 86,596 at the end of the fourth quarter of 2016 (Table 23). The year-on-year fixed data subscription also slowed (15.3%), declining from 75,092 in the preceding year to 86,596 at the end of 2016. At the end of the fourth quarter, fixed data penetration rate still remained low (0.31%).

Table 24: Fixed Data Network Subscription and Penetration

Data subscription	Q4 2015	Q1 2016	Q2 2016	Q3 2016	Q4 2016
Fixed data subscription	75,092	77,312	84,343	87,789	86,596
Fixed data subscription growth rate (%)	*8.2*	*2.9*	*9.1*	*4.1*	*-1.4*
Net Additions	5,667	2,220	7,031	3,446	-1,193
Net Additions growth rate (%)	*-0.52*	*-0.61*	*2.17*	*-0.51*	*-1.35*
Population	27,429,231	27,594,136	27,760,032	27,815,552	28,094,823
Fixed Data penetration rate (%)	*0.27*	*0.28*	*0.30*	*0.32*	*0.31*

Source: NCA; Fixed Network Operators, 2016

Figure 19: Fixed Data Subscription and Penetration



Source: NCA; Fixed Network Operators, 2016

3.4 Fixed Network Data Subscription per Operator

Total fixed data subscription decreased (1.4%) from 87,789 at the end of the third quarter of 2016 to 86,596 at the end of the fourth quarter of 2016 (Table 25). The year-on-year fixed data subscription also slowed (15.3%), declining from 75,092 in the preceding year to 86,596 at the end of 2016. At the end of the fourth quarter, fixed data penetration rate still remained low (0.31%).

Table 25: Fixed Network Data Subscription per Operator

Fixed network operator	Data subscription	Q4 2015	Q1 2016	Q2 2016	Q3 2016	Q4 2016
Vodafone	Data subscription	73,464	75,738	82,745	86,283	85,190
	Market share (%)	*97.8*	*98.0*	*98.1*	*98.3*	*98.4*
Airtel	Data subscription	1,628	1,574	1,598	1,506	1,406
	Market share (%)	*2.2*	*2.0*	*1.9*	*1.7*	*1.6*
Total fixed data subscription		75,092	77,312	84,343	87,789	86,596

Source: NCA; Fixed Network Operators, 2016

4.0 BROADCASTING

4.1 Authorised Frequency Modulation (FM) Radio Stations

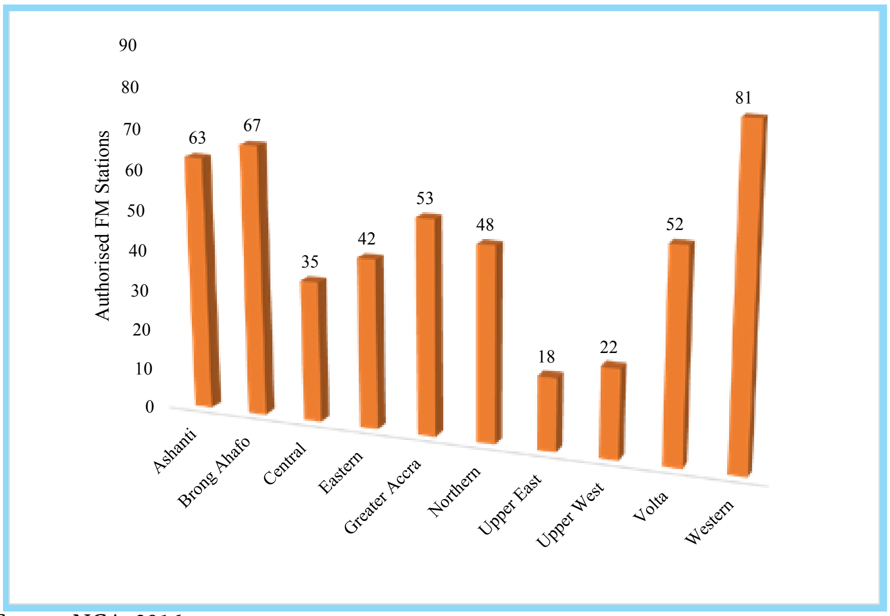
The National Communications Authority (NCA) authorised 29 Frequency Modulation (FM) radio stations in the fourth quarter of 2016, bringing the total number of authorised FM stations to 481, out of which 354 are operational (Table 26). The regional distribution indicates that, Eastern and Upper East regions received no authorization in the fourth quarter of 2016. The rest of the regions received at least one authorization, with Western and Volta regions receiving the highest number (6) of authorisations, followed by Brong- Ahafo (4). Greater Accra and Ashanti regions had 3 authorisations each, and Northern and Central Regions also had 2 authorisations (Table 25). All the 29 newly authorised FM stations were for commercial operations and are currently non-operational (Table 26).

Table 26: Regional Distribution of FM Stations as at the end of Q4 2016

Region	Authorised FM Station			No. of FM stations in operation (Q4 2016)
	End of Q3 2016	Q4 2016	End of Q4 2016	
Ashanti	60	3	63	46
Brong Ahafo	63	4	67	52
Central	33	2	35	29
Eastern	42	0	42	35
Greater Accra	50	3	53	47
Northern	46	2	48	30
Upper East	18	0	18	12
Upper West	19	3	22	11
Volta	46	6	52	36
Western	75	6	81	56
TOTAL	**452**	**29**	**481**	**354**

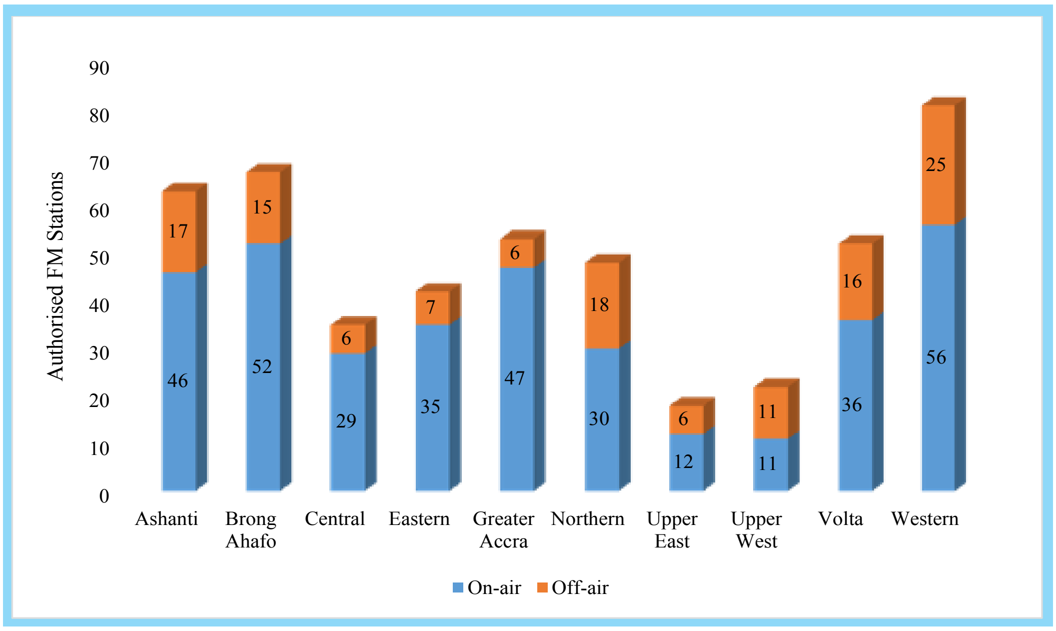
Source: NCA, 2016.

Figure 20: Regional distribution of Authorised FM stations as at end of Q4 2016



Source: NCA, 2016

Figure 21: Regional distribution of On-air and Off-air FM stations as at end of Q4 2016



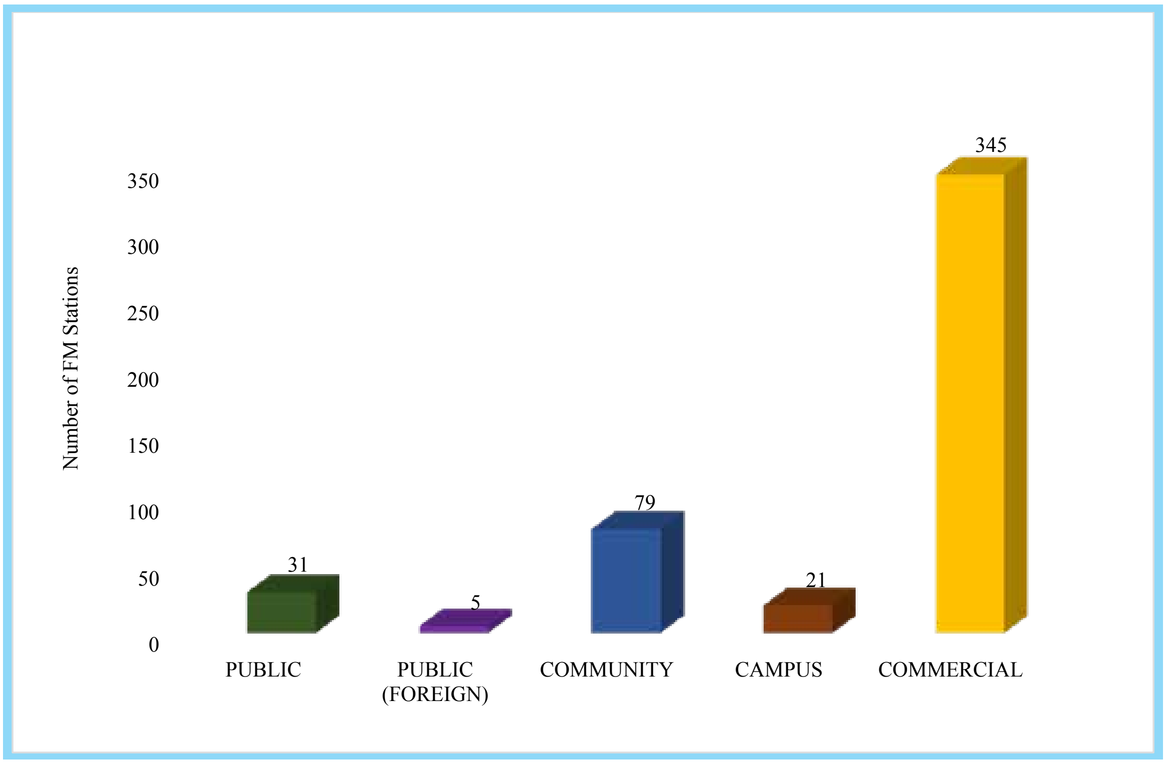
Source: NCA, 2016

Table 27: Authorised FM Stations by type and Region as at the end of Q4 2016

NO	NAME OF REGIONS	TOTAL NO. AUTHORISED	PUBLIC	PUBLIC (FOREIGN)	COMMUNITY	CAMPUS	COMMERCIAL
1	ASHANTI	**63**	2	1	6	3	51
2	BRONG AHAFO	**67**	3	-	7	3	54
3	CENTRAL	**35**	2	-	8	3	22
4	EASTERN	**42**	2	-	6	1	33
5	GREATER ACCRA	**53**	2	3	6	4	38
6	NORTHERN	**48**	7	-	15	1	25
7	UPPER EAST	**18**	2	-	6	1	9
8	UPPER WEST	**22**	2	-	8	2	10
9	VOLTA	**52**	4	-	11	1	36
10	WESTERN	**81**	5	1	6	2	67
TOTAL		**481**	**31**	**5**	**79**	**21**	**345**

Source: NCA, 2016

Figure 22: Types of Authorised Radio Stations as at Q4 2016



Source: NCA, 2016

4.2 Authorised Television Stations

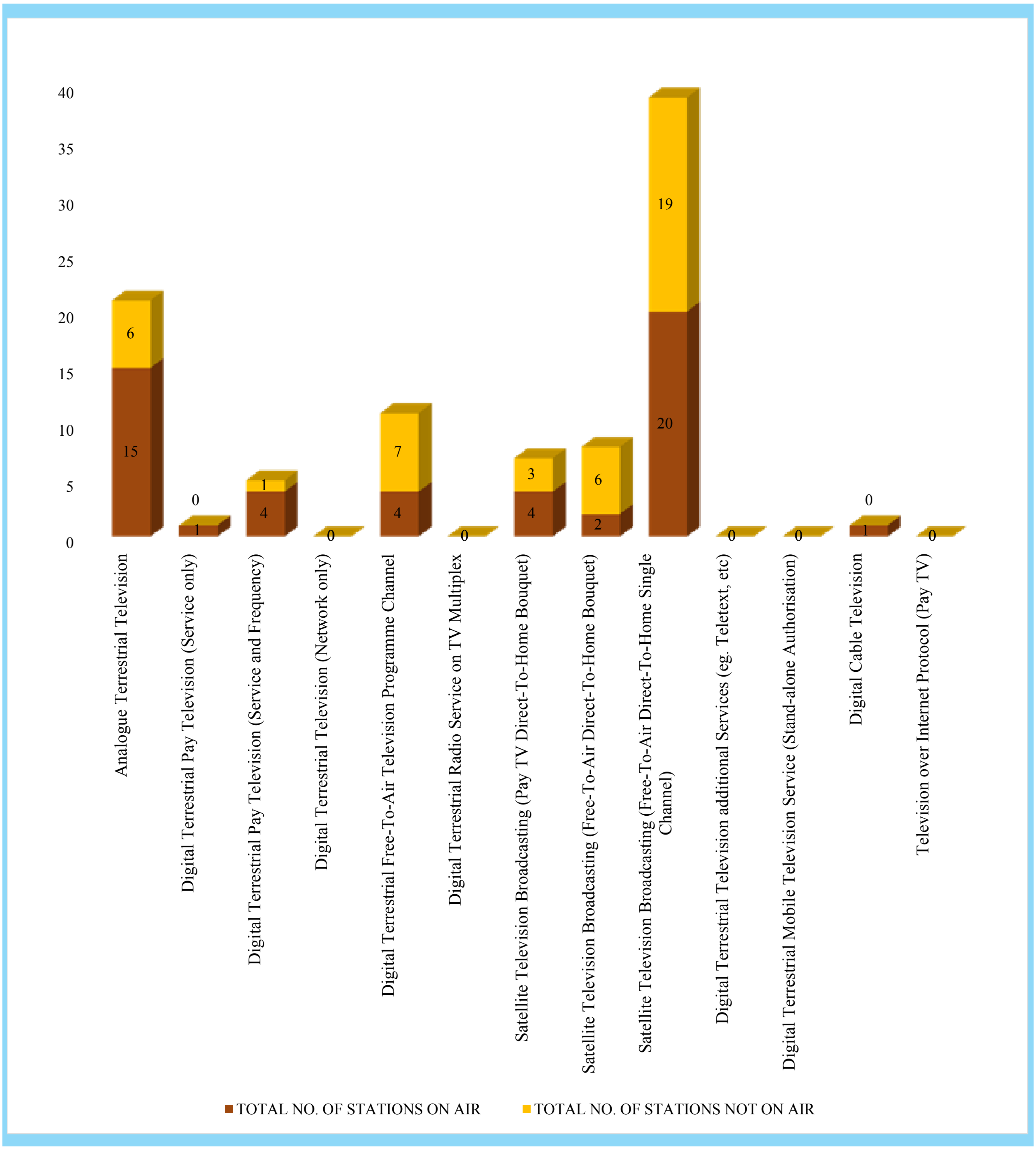
During the fourth quarter of 2016, NCA issued authorisation to eight (8) new television stations, bringing the total number of authorized TV stations in Ghana to ninety-three (93), out of which Fifty-one (51) TV stations are operational (Table 28). These newly authorised TV stations comprised of three (3) Satellite Television Broadcasting (Free-To-Air Direct-To-Home Single Channel), one (1) Satellite Television Broadcasting (Free-To-Air Direct-To-Home Bouquet) and four (4) Digital Terrestrial Free-to-Air Television programme Network (Table 28).

Table 28: Authorised TV Stations in Ghana as at end of Q4 2016

NO	NO. TYPE OF TELEVISION SERVICE	TOTAL NO. OF AUTHORISED STATIONS AS AT THE END OF 3RD QUARTER (Q3)	TOTAL AUTHORIZATIONS IN Q4	TOTAL NO. OF AUTHORISED STATIONS AS AT THE END OF DEC 2016	TOTAL NO. OF STATIONS ON-AIR
1	Analogue Terrestrial Television	21	0	21	15
2	Digital Terrestrial Pay Television (Service only)	1	0	1	1
3	Digital Terrestrial Pay Television (Service and Frequency)	5	0	5	4
4	Digital Terrestrial Television (Network only)	0	0	0	0
5	Digital Terrestrial Free-To-Air Television Programme Channel	7	4	11	4
6	Digital Terrestrial Radio Service on TV Multiplex	0	0	0	0
7	Satellite Television Broadcasting (Pay TV Direct-To-Home Bouquet)	7	0	7	4
8	Satellite Television Broadcasting (Free-To-Air Direct-To-Home Bouquet)	7	1	8	2
9	Satellite Television Broadcasting (Free-To-Air Direct-To-Home Single Channel)	36	3	39	20
10	Digital Terrestrial Television additional Services (eg. Teletext, etc)	0	0	0	0
11	Digital Terrestrial Mobile Television Service (Stand-alone Authorisation)	0	0	0	0
12	Digital Cable Television	1	0	1	1
13	Television over Internet Protocol (Pay TV)	0	0	0	0
TOTAL NO. OF AUTHORISED TV STATIONS		85	8	93	51

Source: NCA, 2016

Figure 23: Distribution of On-Air and Off-Air TV Stations as at end of Q4 2016



Source: NCA, 2016

4.3 Digital Terrestrial Television (DTT) Migration in Ghana

Government of Ghana, in order to fulfil its commitment to the Geneva Agreement of the International Telecommunication Union (ITU), signed a contract in July 2015 with Messrs KNET Limited for the supply and installation of Digital Terrestrial Television (DTT) network in the country. Digital broadcasting is a process in which broadcasting services offered on the traditional analogue technology are replaced with digital networks. The implementation of the DTT in Ghana have been divided into three phases to cover the ten (10) regions of the country as follows:

- Phase 1 – Greater Accra Region, Ashanti Region
- Phase 2 – Volta, Northern, Upper East & Upper West Regions
- Phase 3 – Central, Western, Eastern, BA Regions.

As at the end of the fourth quarter of 2016, the first phase of the DTT project have been completed with successful test run on the DTT platform, simulcasting with analogue TV transmissions. The second phase covering 16 sites in Volta, Northern, Upper East and Upper West Regions have been completed and the third phase has commenced.

The National Communications Authority (NCA) with direct responsibility for telecommunication and broadcasting regulation under the supervision of the Ministry of Communications launched the Digital Terrestrial Television Broadcasting Policy in 2016 to give legal backing to the migration process. The Authority is facilitating the migration of all existing terrestrial analogue television stations to the digital platform.

Within the fourth quarter of 2016, four (4) television stations were granted authorisation to operate Digital Terrestrial Free to Air Television Programme channel. Out of the four authorised TV station, only one (C Television) is currently on-air, all the three others are yet to commence operation (Table 29). As at the end of fourth quarter 2016, a total of eleven (11) Digital Terrestrial Free-To-Air Television Programme Channel were authorised, of which seven (7) are currently operational (Table 28).

Table 29: Authorised Digital Terrestrial Free to Air TV Programme Channel in Q4 2016

Name of television station	Status
1. LPT Services Limited	Not on Air
2. Angel Broadcasting Services Ltd	Not on Air
3. Orakle Advertising Ltd	Not on Air
4. C Television Ltd	On Air

Source: NCA, 2016

5.0 CONCLUSION

The total mobile subscription in Ghana increased to 38,305,078 with a penetration rate of 136.3%. Volume of mobile voice traffic also increased by 2.97% to 13.16 billion minutes in the fourth quarter of 2016. At the end of the fourth quarter of 2016, twenty-nine (29) additional FM radio stations and eight (8) television stations were authorised, bringing the total number of authorised FM radio and television stations in Ghana to 481 and 93 respectively. Mobile data and BWA subscriptions increased as well as their corresponding data traffic.

6.0 APPENDICES

Table 1: Monthly Mobile Subscription

Mobile Operators	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16
MTN	15,711,124	15,950,876	16,254,984	16,511,670	16,787,446	17,004,445	17,192,543	17,428,380	17,579,045	17,774,481	17,890,958	18,050,144	18,280,956	18,766,106	19,296,157
Vodafone	7,468,843	7,526,704	7,612,059	7,740,240	7,859,486	7,900,534	7,976,348	8,054,346	8,093,710	8,160,351	8,223,957	8,158,527	8,170,504	8,304,783	8,289,913
Tigo	4,639,152	4,786,094	4,850,034	5,004,386	5,026,237	5,062,304	5,213,398	5,203,063	5,261,454	5,211,811	5,225,021	5,402,668	5,362,642	5,365,318	5,339,052
Airtel	4,528,416	4,684,429	4,796,645	4,821,760	4,910,607	5,012,239	4,942,181	4,798,480	4,678,736	4,636,374	4,642,569	4,697,653	4,686,625	4,649,934	4,591,051
Glo	1,389,545	1,324,833	1,369,402	1,252,275	1,103,301	1,048,635	962,338	944,260	897,082	854,912	822,539	828,162	769,450	750,751	695,306
Expresso	126,546	127,217	125,263	121,113	115,058	110,549	108,292	106,082	103,960	101,881	106,975	102,566	99,489	95,548	93,599
Total	**33,863,626**	**34,400,153**	**35,008,387**	**35,451,444**	**35,802,135**	**36,138,706**	**36,395,100**	**36,534,611**	**36,613,987**	**36,739,810**	**36,912,019**	**37,239,720**	**37,369,666**	**37,932,440**	**38,305,078**

Table 2: Monthly Prepaid Mobile Subscription

Mobile Operators	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16
MTN	15,597,630	15,831,028	16,106,958	16,361,960	16,634,702	16,847,615	17,027,426	17,262,177	17,411,418	17,598,073	17,711,566	17,865,305	18,091,304	18,573,076	19,100,570
Vodafone	7,445,122	7,506,781	7,593,854	7,722,035	7,841,281	7,884,489	7,838,186	7,915,864	7,950,796	8,015,711	8,078,374	8,003,589	8,011,304	8,160,418	8,143,344
Tigo	4,612,566	4,759,723	4,823,684	4,978,467	5,000,412	5,037,529	5,187,849	5,176,854	5,235,048	5,185,381	5,198,446	5,376,059	5,336,023	5,338,664	5,312,298
Airtel	4,516,733	4,672,713	4,784,895	4,809,980	4,898,751	5,000,334	4,930,206	4,786,471	4,666,702	4,624,331	4,629,707	4,684,772	4,673,725	4,637,026	4,578,126
Glo	1,388,315	1,323,623	1,368,215	1,251,079	1,102,163	1,047,455	961,172	943,123	896,019	853,948	821,639	827,307	768,604	749,798	694,375
Expresso	121,152	122,114	120,282	116,193	110,383	105,968	103,848	101,771	99,736	97,741	102,628	98,523	95,567	91,745	89,910
Total	**33,681,518**	**34,215,982**	**34,797,888**	**35,239,714**	**35,587,692**	**35,923,390**	**36,048,687**	**36,186,260**	**36,259,719**	**36,375,185**	**36,542,360**	**36,855,555**	**36,976,527**	**37,550,727**	**37,918,623**

Table 3: Monthly Post-Paid Mobile Subscription

Mobile Operators	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16
MTN	113,494	119,848	148,026	149,710	152,744	156,830	165,117	166,203	167,627	176,408	179,392	184,839	189,652	193,030	195,587
Vodafone	23,721	19,923	18,205	18,205	18,205	16,045	138,162	138,482	142,914	144,640	145,583	154,938	159,200	144,365	146,569
Tigo	26,586	26,371	26,350	25,919	25,825	24,775	25,549	26,209	26,406	26,430	26,575	26,609	26,619	26,654	26,754
Airtel	11,683	11,716	11,750	11,780	11,856	11,905	11,975	12,009	12,034	12,043	12,862	12,881	12,900	12,908	12,925
Glo	1,230	1,210	1,187	1,196	1,138	1,180	1,166	1,137	1,063	964	900	855	846	953	931
Expresso	5,394	5,103	4,981	4,921	4,675	4,581	4,444	4,310	4,224	4,140	4,347	4,042	3,921	3,804	3,689
Total	**182,108**	**184,171**	**210,499**	**211,731**	**214,443**	**215,316**	**346,413**	**348,350**	**354,268**	**364,625**	**369,659**	**384,164**	**393,138**	**381,714**	**386,455**

Table 4: Monthly Mobile Data Subscription

Mobile Operators	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16
MTN	8,404,777	8,477,791	8,634,914	8,807,337	8,940,472	9,066,405	9,163,083	9,288,548	9,369,407	9,429,065	9,608,952	9,745,986	9,875,422	9,981,935	10,226,520
Vodafone	3,235,522	3,237,643	3,316,343	3,384,636	3,403,780	3,390,276	3,334,093	3,340,452	3,271,790	3,278,834	3,301,319	3,314,912	3,340,171	3,345,418	3,474,090
Tigo	2,655,929	2,692,510	2,732,863	2,732,348	2,722,504	2,707,411	2,703,106	2,704,110	2,716,023	2,743,364	2,817,896	2,872,375	2,857,291	2,782,031	2,725,489
Airtel	2,768,950	2,823,039	2,879,431	2,930,413	2,978,334	3,177,620	3,048,954	3,067,502	3,058,545	3,052,219	3,082,800	3,092,700	3,052,100	2,971,378	2,902,009
Glo	478,593	448,762	419,459	390,398	358,996	325,987	312,746	306,336	298,622	281,724	271,756	265,085	263,817	245,874	277,372
Expresso	47,680	48,567	48,178	47,408	45,037	44,136	43,254	42,389	41,541	40,710	42,746	40,181	38,975	37,806	36,672
Industry average	**17,591,451**	**17,728,312**	**18,031,188**	**18,292,540**	**18,449,123**	**18,711,835**	**18,605,236**	**18,749,337**	**18,755,928**	**18,825,916**	**19,125,469**	**19,331,239**	**19,427,776**	**19,364,442**	**19,642,152**

Table 5: Monthly Prepaid Data Subscription

Mobile Operators	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16
MTN	8,346,716	8,417,514	8,565,286	8,741,420	8,860,602	8,982,370	9,070,263	9,188,625	9,262,152	9,315,265	9,489,759	9,622,891	9,746,707	9,846,347	10,089,003
Vodafone	3,220,742	3,222,878	3,301,838	3,371,152	3,390,028	3,376,648	3,320,472	3,326,492	3,257,985	3,264,915	3,287,493	3,301,040	3,326,321	3,331,546	3,460,195
Tigo	2,646,640	2,683,432	2,723,790	2,723,287	2,713,524	2,698,900	2,694,441	2,695,461	2,707,376	2,734,718	2,809,253	2,863,782	2,848,696	2,773,763	2,717,222
Airtel	2,757,076	2,807,068	2,863,357	2,913,779	2,961,119	3,160,130	3,031,449	3,049,952	3,040,994	3,034,667	3,065,233	3,075,133	3,034,532	2,953,807	2,884,424
Glo	477,645	447,830	418,546	389,017	357,649	324,608	311,866	305,498	297,341	280,504	270,585	264,420	263,173	244,793	276,313
Expresso	47,680	48,567	48,178	47,408	45,037	44,136	43,254	42,389	41,541	40,710	42,746	40,181	38,975	37,806	36,672
Industry average	**17,496,499**	**17,627,289**	**17,920,995**	**18,186,063**	**18,327,959**	**18,586,792**	**18,471,745**	**18,608,417**	**18,607,389**	**18,670,779**	**18,965,069**	**19,167,447**	**19,258,404**	**19,188,062**	**19,463,829**

Table 6: Monthly Post-Paid Mobile Data Subscription

Mobile Operators	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16
MTN	58,061	60,277	69,628	65,917	79,870	84,035	92,820	99,923	107,255	113,800	119,193	123,095	128,715	135,588	137,517
Vodafone	14,780	14,765	14,505	13,484	13,752	13,628	13,621	13,960	13,805	13,919	13,826	13,872	13,850	13,872	13,895
Tigo	9,289	9,078	9,073	9,061	8,980	8,511	8,665	8,649	8,647	8,646	8,643	8,593	8,595	8,268	8,267
Airtel	11,874	15,971	16,074	16,634	17,215	17,490	17,505	17,550	17,551	17,552	17,567	17,567	17,568	17,571	17,585
Glo	948	932	913	1,381	1,347	1,379	880	838	1,281	1,220	1,171	665	644	1,081	1,059
Expresso	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Industry average	94,952	101,023	110,193	106,477	121,164	125,043	133,491	140,920	148,539	155,137	160,400	163,792	169,372	176,380	178,323

Table 7: Off-net SMS to other Networks

Mobile Operators	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16
MTN	10,864,786	10,419,278	12,076,891	12,299,394	10,686,131	11,755,768	11,867,000	12,052,204	12,297,643	13,260,101	14,768,315	13,337,011	12,992,266	12,123,754	13,348,795
Vodafone	7,667,792	7,532,679	8,974,958	8,970,129	7,207,946	7,506,737	7,363,743	8,676,972	9,370,148	10,331,648	9,501,292	7,696,758	-	-	9,789,941
Tigo	6,319,643	5,913,393	7,170,698	7,314,304	6,126,281	12,962,902	6,701,949	6,873,332	6,883,239	7,373,151	8,228,736	7,544,403	6,729,420	5,884,314	6,465,860
Airtel	10,423,189	10,810,511	17,353,054	7,379,168	-	9,052,478	9,260,675	9,769,462	4,964,200	5,411,524	6,166,528	5,430,920	9,250,086	4,528,356	4,924,627
Glo	850,060	647,701	662,087	1,102,373	480,950	537,385	1,031,624	534,474	436,371	533,346	592,661	536,237	511,721	480,347	519,740
Expresso	4,346	4,231	-	-	8,062	-	-	-	-	-	-	-	-	-	-
Total	**36,129,816**	**35,327,793**	**46,237,688**	**37,065,368**	**24,509,370**	**41,815,270**	**36,224,991**	**37,906,444**	**33,951,601**	**36,909,770**	**39,257,532**	**34,545,329**	**29,483,493**	**23,016,771**	**35,048,963**

Table 8: On-net SMS

Mobile Operators	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16
MTN	34,211,952	31,574,817	36,243,804	24,598,788	32,986,520	36,206,112	37,018,658	36,792,435	38,277,997	39,098,337	45,044,809	43,243,142	43,213,681	41,951,350	47,711,055
Vodafone	-	24,835,974	28,756,719	30,497,916	28,049,336	29,983,773	29,585,775	25,271,071	29,582,194	32,617,714	37,121,468	26,434,537	25,483,546	21,623,136	27,615,172
Tigo	32,887,566	27,946,553	32,894,758	32,811,938	26,202,310	30,470,015	-	32,753,041	32,266,170	34,335,759	33,090,602	33,559,657	28,742,141	21,127,360	22,741,408
Airtel	3,289,150	3,024,045	3,534,250	3,596,973	-	5,430,276	5,560,721	5,204,833	5,312,812	6,093,711	6,751,037	6,219,581	5,388,074	4,528,356	4,634,866
Glo	268,668	-	185,994	156,702	119,370	142,671	151,429	138,745	-	129,214	145,038	124,466	109,840	91,828	97,085
Expresso	8,692	-	17	-	-	-	-	-	-	-	-	-	-	-	-
Total	**70,666,028**	**87,381,389**	**101,615,542**	**91,662,317**	**87,357,536**	**102,232,847**	**72,316,584**	**100,160,124**	**105,439,173**	**112,274,735**	**122,152,953**	**109,581,383**	**102,937,282**	**89,322,030**	**102,799,586**

43

Table 9: Mobile Voice On-net Tariff per Operator (GHp)

Mobile Operators	**Q3 2015**	**Q4 2015**	**Q1 2016**	**Q2 2016**	**Q3 2016**	**Q4 2016**
MTN	11	11	11	11	11	11
Vodafone	11	11	11	11	11	11
Tigo	4	6	11	11	12	13
Airtel	11	11	11	11	11	11
Glo	14	14	14	14	14	14
Expresso	8	8	10	10	10	-
Industry average	**10**	**10**	**11**	**11**	11	12

Table 10: Mobile Voice Off-net Tariff per Operator (GHp)

Mobile Operators	Q3 2015	Q4 2015	Q1 2016	Q2 2016	Q3 2016	Q4 2016
MTN	13	13	13	13	13	13
Vodafone	13	13	13	13	13	13
Tigo	11	11	11	11	12	13
Airtel	12	12	12	12	12	12
Glo	14	14	14	14	14	14
Expresso	12	12	15	15	15	-
Industry average	**12**	**12**	**13**	**13**	13	13

Table 11: SMS On-net Tariff per Operator (GHp)

Mobile Operators	Q3 2015	Q4 2015	Q1 2016	Q2 2016	Q3 2016	Q4 2016
MTN	5	5	5	5	5	5
Vodafone	5	5	5	6	6	6
Tigo	5	8	8	8	8	8
Airtel	4	4	4	4	4	4
Glo	4	4	5	5	5	5
Expresso	4	4	4	4	4	-
Industry average	**4**	**5**	**5**	**5**	6	6

Table 12: SMS Off-net Tariff per Operator (GHp)

Mobile Operators	Q3 2015	Q4 2015	Q1 2016	Q2 2016	Q3 2016	Q4 2016
MTN	6	6	6	6	6	6
Vodafone	5	6	7	7	7	7
Tigo	6	8	8	8	8	8
Airtel	5	5	5	5	5	5
Glo	5	5	5	5	5	5
Expresso	4	4	4	4	4	-
Industry average	**5**	**5**	**6**	**6**	6	6

Disclaimer:

The National Communications Authority has been diligent to ensure the data in this bulletin are accurate. However, the Authority is not liable for inconsistencies, errors, and gaps in any data or information contained in this bulletin, which is dependent upon the various licensees data submissions to the Authority.

NCA CONTACTS AND PRESENCE COUNTRYWIDE

The Authority currently has eight (8) regional offices to support its operations. Their addresses are listed below

- ### Accra, Head Office

National Communications Authority,
NCA Tower, No 6 Airport City
Close to the Marina Mall
P. O. Box CT 1568, Cantonments, Accra
Tel: +233 (0) 302 776621, 771701
Fax: +233 (0) 302 763449
E-mail: info@nca.org.gh
Complaints: +233 (0) 30 701 1419
complaints@nca.org.gh
Website: www.nca.org.gh

- ### Bolgatanga Office

National Communications Authority,
H/No ZB 70, Zorbisi Estates
Bolgatanga, Upper East Region
Tel: +233 (0) 3820 21141
E-mail: complaints.bolgatanga@nca.org.gh

- ### Ho Office

National Communications Authority,
H/No A6/29, Stadium Road
P. O. Box HP1576, Ho, Volta Region
Tel: +233 (0) 3620 26339
E-Mail: complaints.ho@nca.org.gh

- ### Koforidua Office

National Communications Authority,
Residency Road
Behind New Juabeng Municipal Library
Private Mail Bag, Koforidua, Eastern Region
Tel: +233 (0) 3420 28378, 28380, 28382
E-Mail: complaints.koforidua@nca.org.gh

- ### Kumasi Office

National Communications Authority,
Danyame, Kumasi
P. O. Box KS 10768, Kumasi,
Ashanti Region, Ghana
Tel: + 233 (0) 32 202 0014 / 32 202 0018 / 32 202 0019
Fax: (+233) 32 002 0064
E-Mail: complaints.kumasi@nca.org.gh

- ### Sunyani Office

National Communications Authority,
Plot No 83/D Peakwase
P. O. Box SY125, Sunyani, Brong Ahafo Region
Tel: +233 (0) 3520 27564
E-Mail: complaints.sunyani@nca.org.gh

- ### Takoradi Office

National Communications Authority,
Bakado, 1.2kms away from the Female Prisons
P. O. Box SL 409, Sekondi,
Western Region, Ghana
Tel: +233 (0) 31 202 8073 / 31 202 8049
Fax: +233 (0) 31 202 8063
E-Mail: complaints.takoradi@nca.org.gh

- ### Tamale Office

National Communications Authority,
Watherson Residential Area
P. O. Box TL 1590, Tamale,
Northern Region, Ghana
Tel: + 233 (0) 37 202 8105 / 37 020 8104
Fax: +233 (0) 37 202 8104
E-Mail: complaints.tamale@nca.org.gh


NCA