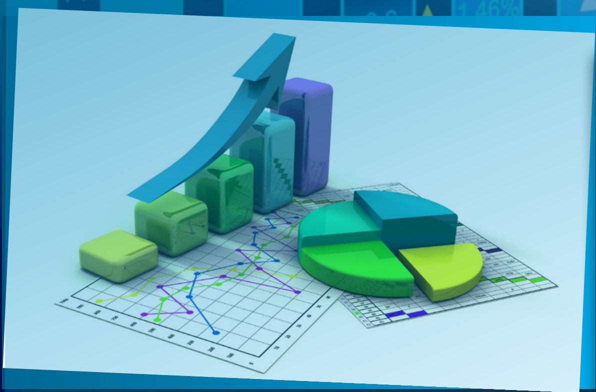
QUARTERLY STATISTICAL BULLETIN ON COMMUNICATIONS IN GHANA

Volume 1 Issue 2



NATIONAL
COMMUNICATIONS
AUTHORITY

SECOND QUARTER

APRIL - JUNE 2016

Communications for Development

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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 analysis of the Ghanaian communications sector. It is intended to enhance an open and better-informed public discussions on policies and development in the communications sector in Ghana.

It also provides critical statistical data for policy makers, telecom analyst, consumers, academia, investors and other stakeholders for their decision-making. The bulletin is data-centric and combines succinct analysis of the data trends with substantial use of tables, graphs and figures for easy understanding.

This bulletin is the product of the responses from the monthly and quarterly questionnaires sent to the various licensees; 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 2008, Electronic Communications 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".

DEFINITION OF TERMS

Cellular network or mobile network - 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 typically 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.

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

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

Net subscriber 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 – comparison of quarter under review with the preceding quarter.

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

1.0 THE COMMUNICATIONS INDUSTRY AT A GLANCE

Mobile Subscription: The total subscription increased by 1.3% from 36,138,706 in the first quarter of 2016 to 36,613,987 at the end of the second quarter of 2016.

Mobile penetration also increased marginally from 131.0% in the first quarter of 2016 to 131.9% at the end of the second quarter of 2016.

The share of post-paid subscription increased year-on-year by 100% from 0.5% in the second quarter of 2015 to 1.0% at the end of the second quarter of 2016.

Domestic Mobile Voice Traffic: Total mobile voice traffic declined by 2.3% quarter-on-quarter, from 15.05 billion minutes during the first quarter of 2016 to 14.80 billion minutes at the end of the second quarter of 2016.

Year-on-year total volume of mobile traffic increased by 14.6%, inching up from 12.92 billion minutes in the second quarter of 2015 to 14.80 billion minutes in the second quarter of 2016.
The total minutes of use per subscriber for the second quarter of 2016 was 134 minutes, 4 minutes lower (-2.9%) than the first quarter of 2016.

International Traffic: The year-on-year volume of inbound international traffic fell by 17.7%, decreasing from 189.2 million minutes in the second quarter of 2015 to 155.8 million minutes in 2016. Similarly, outbound international traffic declined from 217.7 million minutes to 178.9 million minutes, a year-on-year decline of 17.8%. Quarter-on-quarter traffic also declined.

Short Message Services (SMS): The total volume of SMS generated across the various networks expanded by 5.3%, increasing from 485.69 million in the first quarter to 511.85 million SMS at the end of the second quarter of 2016.

Mobile Data Subscription and Penetration: Mobile data subscription for the second quarter of 2016 was 18.8 million with a penetration rate of 67.6%.

Total volume of mobile data usage expanded by 19.5% during the second quarter of 2016, increasing from 12.8 million Gigabytes to 15.3 million Gigabytes.

Mobile Number Portability (MNP): During the second quarter of 2016, a total of 161,703 ported their mobile numbers from one service provider to another.

Broadband Wireless Access (BWA): BWA subscription increased by 7.1% during the period under review, expanding from 101,851 to 109,124.

Total data usage at the end of the second quarter of 2016 was 2.65 million gigabytes, compared to 2.26 million GB for the previous quarter, and increase of 17.2%.
The average monthly data usage per BWA subscriber was 24.27 gigabytes during the period under review.

Fixed Network Subscription: Total fixed line subscription reduced to 256,653 from the previous quarter's figure of 258,536, a reduction of 0.7%.

Broadcasting: The total number of FM stations authorised by the NCA as at the end of June 2016 was 448, out of which 345 are operational.

Eight (8) television stations received authorisations during the second quarter of 2016, bringing the total number of authorised televisions stations to 75 out of which 34 are operational, representing 45% of the total authorised TV stations.

1.1 KEY REGULATORY INTERVENTIONS IN THE SECOND QUARTER OF 2016

1.1.1 NCA cracks down on illegal frequency users in the internet service providers (ISP) bands

The National Communications Authority embarked on a frequency monitoring and inspection exercise during the period under review. This led to the decommissioning and confiscation of transmitters and antennas illegally operating in the 2.3GHz, 3.3GHz, 3.5GHz and 3.6GHz frequency bands in the Greater Accra Region. The aforementioned bands are classified by NCA as "Licensed bands" and are allocated for use by Internet Service Providers (ISPs).

1.1.2 Coming into force of the Electronic Communications (Rules of Procedure of the Electronic Communications Tribunal) Regulations, 2016

The Electronic Communications (Rules of Procedure of the Electronic Communications Tribunal) Regulations 2016 came into force on Tuesday, July 26, 2016. The regulations can be downloaded from the NCA website, **www.nca.org.gh.**

1.1.3 Promulgation of Electronic Communications (Interconnect Clearinghouse Services) Regulations, 2016

The Electronic Communications (Interconnect Clearinghouse Services) Regulations, 2016 was promulgated on Tuesday, June 21, 2016. The regulations can be downloaded from the NCA website www.nca.org.gh

The purpose of the Regulations is to regulate the:

a) activities of network operators and service providers who connect and route national and international traffic through an Interconnect Clearinghouse; and

b) operations of an Interconnect Clearinghouse licensed by the Authority

2.0 MOBILE NETWORK

This section analyses trends in mobile subscription, domestic traffic, international traffic, minutes of use, short message service (SMS), tariffs, mobile number portability (MNP) and mobile data subscription and usage. It presents a synopsis of the quarter-on-quarter as well as year-on-year analysis of the growth and dynamics and comparison of the indicators mentioned above.

2.1 Mobile subscription and penetration

Mobile services are now integral parts of Ghanaians daily activities. It serves as means of voice communications, email, social networking, commerce, and web browsing among others. There were six mobile network operators (MNOs) offering various services in Ghana as at the end of the second quarter of 2016. These mobile networks are:

i. MTN
ii. Vodafone
iii. Tigo
iv. Airtel
v. Glo
vi. Expresso

Total mobile subscription in Ghana increased by 1.3% quarter-on-quarter, from 36,138,706 in the first quarter of 2016 to 36,613,987 as at the end of the second quarter of 2016, based on the data provided by the mobile network operators (Table 1). The year-on-year total subscription was up by 13.1%, from 32,363,111 in June 2015.

Mobile penetration also increased marginally from 131.0% in the first quarter of 2016 to 131.9% as at the end of the second quarter (Figure 1). Mobile penetration is estimated by dividing the total number of mobile subscribers by the total population of Ghana.

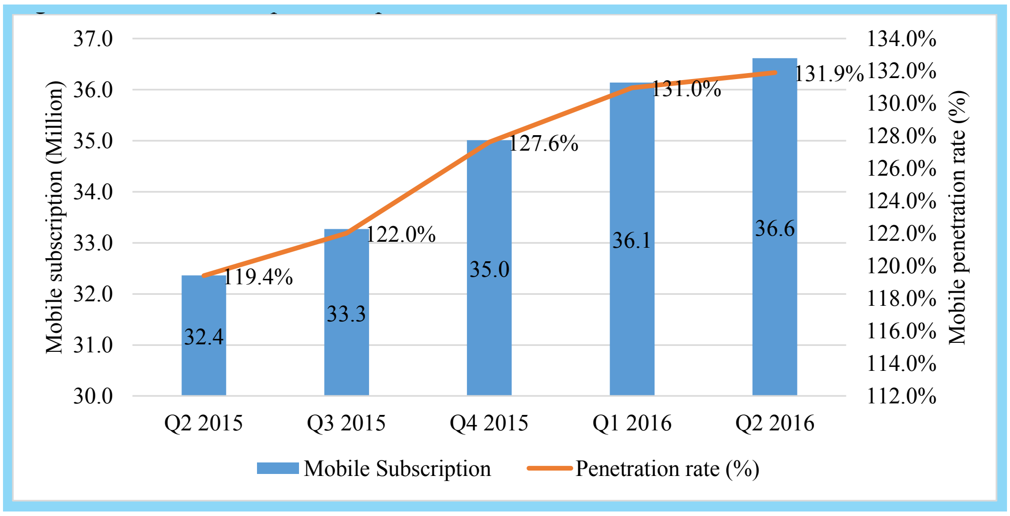
Examining net additions to mobile subscription provides further insight into the growth of the industry. Net additions are the outcome of subscribers acquiring additional mobile wireless devices, such as tablets, phones as well as new subscribers particularly people purchasing mobile wireless services for the first time. Total net additions to mobile subscription was down, 58% from 1,130,319 in the first quarter to 475,281 in the second quarter of 2016, the least number of net additions in the past five quarters.

Table 1: Mobile subscription and penetration rate

Subscription	Q2 2015	Q3 2015	Q4 2015	Q1 2016	Q2 2016
Mobile Subscription	32,363,111	33,270,440	35,008,387	36,138,706	36,613,987
Mobile Subscription growth Rate (%)	*5.7*	*2.8*	*5.2*	*3.2*	*1.3*
Net additions	1,208,691	907,329	1,737,947	1,130,319	475,281
Net additions Growth Rate (%)	*349.6*	*-24.9*	*91.5*	*-35*	*-58*
Population	27,102,372	27,265,312	27,429,231	27,594,136	27,760,032
Penetration rate (%)	*119.4*	*122*	*127.6*	*131*	*131.9*

Source: NCA; Mobile Network Operators, 2016

Figure 1: Mobile subscription and penetration



Source: NCA; Mobile Network Operators, 2016

2.1.1 Mobile subscription per operator

During the second quarter of 2016, MTN consolidated its share of the mobile market in Ghana with a total subscriber base of 17,579,045, representing 48.0% of the market (Table 2). This was followed by Vodafone with 8,093,710 subscribers (22.1%) and Tigo 5,261,454 subscribers (14.4%). Airtel, Glo and Expresso recorded net losses in subscriber base and decline in their market shares in the second quarter of 2016 (Table 2).

Table 2: Subscription and market share (%) per operator

Mobile Network Operator		**Q2 2015**	**Q3 2015**	**Q4 2015**	**Q1 2016**	**Q2 2016**
MTN	Subscription	14,886,291	15,493,052	16,254,984	17,004,445	17,579,045
	Market Share (%)	*46.00*	*46.6*	*46.4*	*47.1*	*48.0*
Vodafone	Subscription	7,296,394	7,397,022	7,612,059	7,900,534	8,093,710
	Market Share (%)	*22.5*	*22.2*	*21.7*	*21.9*	*22.1*
Tigo	Subscription	4,490,078	4,479,898	4,850,034	5,062,304	5,261,454
	Market Share (%)	*13.9*	*13.5*	*13.9*	*14.0*	*14.4*
Airtel	Subscription	4,111,766	4,383,674	4,796,645	5,012,239	4,678,736
	Market Share (%)	*12.7*	*13.2*	*13.7*	*13.9*	*12.8*
Glo	Subscription	1,445,727	1,383,812	1,369,402	1,048,635	897,082
	Market Share (%)	*4.5*	*4.2*	*3.9*	*2.9*	*2.5*
Expresso	Subscription	132,855	132,982	125,263	110,549	103,960
	Market Share (%)	*0.4*	*0.4*	*0.4*	*0.3*	*0.3*
Total		32,363,111	33,270,440	35,008,387	36,138,706	36,613,987

Source: NCA; Mobile Network Operators, 2016

2.1.2 *Prepaid and post-paid mobile subscription*

The mobile market continues to be dominated by prepaid subscribers (99.0%), however, the year-on-year market share of post-paid subscription increased from 0.5% to 1.0%, (100% growth) (Table 3). Total post-paid subscription increased from 163,597 during the second quarter of 2015 to 354,268 at the end of the second quarter of 2016. The quarter-on-quarter growth in post-paid subscription was 64.53%.

Although the prepaid subscription dominated the market, its share of the total market declined by 0.4% during the second quarter of 2016, with the total prepaid subscription of 36,259,719 an increase from the 35,923,390 in the first quarter of 2016 (Table 3).

Table 3: Prepaid and post-paid subscription

Subscription		**Q2 2015**	**Q3 2015**	**Q4 2015**	**Q1 2016**	**Q2 2016**
Prepaid	Subscription	32,199,514	33,091,299	34,797,888	35,923,390	36,259,719
	Share (%)	*99.5*	*99.5*	*99.4*	*99.4*	*99.0*
Post-paid	Subscription	163,597	179,141	210,499	215,316	354,268
	Share (%)	*0.5*	*0.5*	*0.6*	*0.6*	*1.0*
Total mobile subscription		**32,363,111**	**33,270,440**	**35,008,387**	**36,138,706**	**36,613,987**

Source: NCA; Mobile Network Operators, 2016

2.2 Mobile Voice Traffic (Domestic)

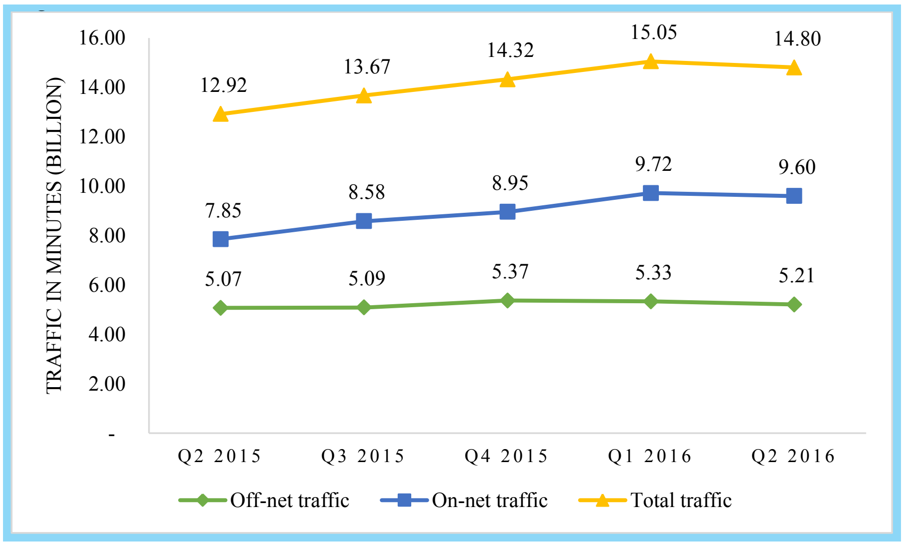
As the total mobile subscription keeps growing, the voice traffic is expected to expand in a similar direction. However, the voice traffic data received from the mobile network operators show that the total volume of domestic voice traffic declined during the second quarter of 2016 (Figure 2).

Total mobile voice traffic declined by 2.3% from 15.05 billion minutes during the first quarter of 2016 to 14.80 billion minutes at the end of the second quarter of 2016 (Figure 2). As discussed in the First Quarter Report, the decline in mobile voice traffic may be an indication that mobile phone subscribers are resorting to alternative communications medium such as over-the-top services.

Both on-net and off-net traffic for the second quarter 2016 declined, with the decline in off-net traffic starting from the fourth quarter of 2015. On-net traffic declined from 9.72 billion minutes to 9.60 billion minutes in the second quarter with off-net traffic declining from 5.33 billion minutes to 5.21 billion minutes for the same period.

On annual basis however, the traffic volume for 2016 was higher than the previous year. Year-on-year total volume of mobile traffic increased by 14.6%, inching up from 12.92 billion minutes in the second quarter of 2015 to 14.80 billion minutes in the second quarter of 2016. Both off-net and on-net mobile traffic recorded positive year-on-year growth (Figure 2).

Figure 2: Mobile voice traffic



Source: NCA; Mobile Network Operators, 2016

2.2.1 Minutes of use (MoU)

This subsection presents information on the average monthly consumption of mobile voice services by subscribers. It measures the subscriber's average monthly duration for making and receiving calls, referred to as minutes of use. The minutes of use is a monthly variable, which is computed by dividing the total traffic for a particular month by the total subscription for that month.

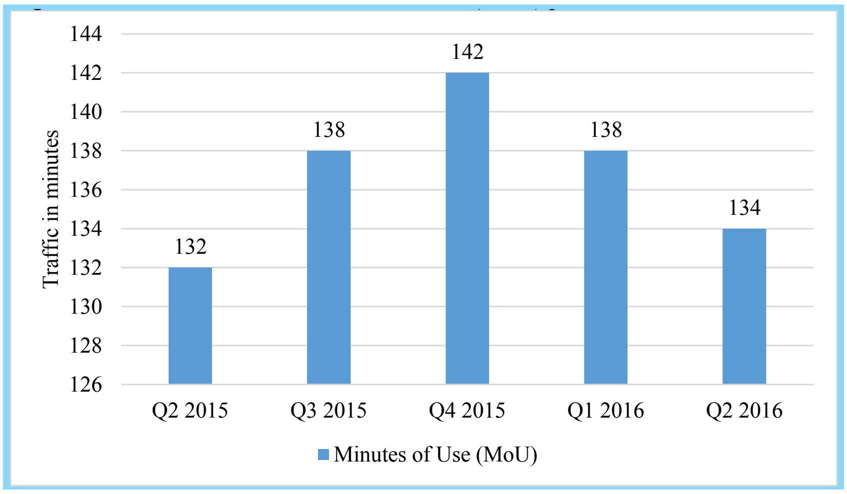
The monthly reported minutes of use, per subscriber for the second quarter of 2016 was 134 minutes, 4 minutes lower (-2.9%) than the first quarter of 2016 (Table 4). In other words, a mobile subscriber made or received phone call for an average duration of 2 hours and 14 minutes per month during the second quarter of 2016.

Table 4: Monthly minutes of use (MoU) per subscriber

Traffic	Q2 2015	Q3 2015	Q4 2015	Q1 2016	Q2 2016
Total mobile traffic	4,271,014,019	4,576,410,790	4,986,378,886	4,989,862,159	4,905,966,394
Mobile subscription	32,363,111	33,270,440	35,008,387	36,138,706	36,613,987
Minutes of Use (MoU)	132	138	142	138	134
MoU growth rate (%)	-6.4	4.5	2.9	-2.8	-2.9

Source: NCA; Mobile Network Operators, 2016

Figure 3: Mobile voice traffic minutes of use (MoU) per subscriber



Source: NCA; Mobile Network Operators, 2016

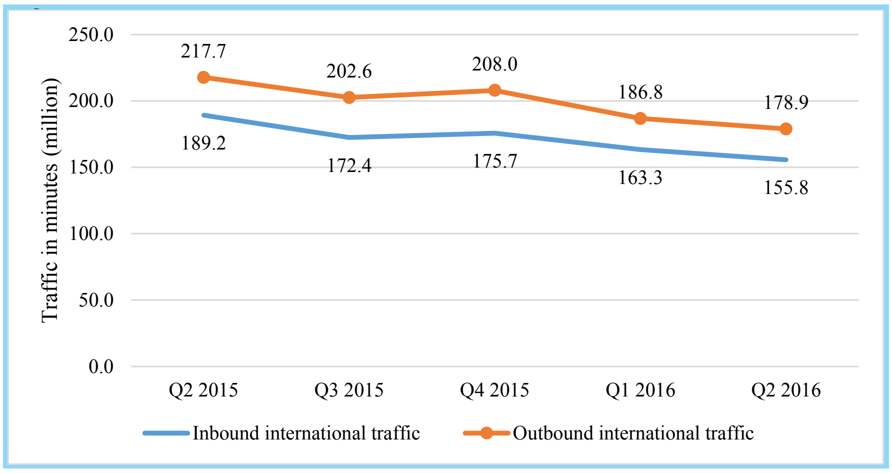
2.3 International traffic

International voice traffic comprises inbound (all calls originating outside Ghana and terminating on a mobile network in Ghana) and outbound (calls originating from Ghana that are terminated on a network outside Ghana) traffic. Over the past three quarters, both inbound and outbound international traffic to and from Ghana have been declining.

The total volume of international traffic entering Ghana (inbound international traffic) decreased from 163.3 million minutes in the first quarter of 2016 to 155.8 million minutes in the second quarter of 2016, showing a 4.6% quarter-on-quarter decline (Figure 4). Outbound international traffic also declined by 4.2% quarter-on-quarter, reducing from 186.8 million minutes in the first quarter to 178.9 million minutes in the second quarter of 2016 (Figure 4).

The year-on-year volume of inbound international traffic also dipped significantly (17.7%), from 189.2 million minutes in the second quarter of 2015 to 155.8 million minutes at the end of June 2016. Similarly, outbound international traffic declined from 217.7 million minutes in 2015 to 178.9 million minutes in 2016, indicating a year-on-year decline of 17.8% (Figure 4).

Figure 4: International traffic



Source: NCA; Mobile Network Operators, 2016

2.4 Short Message Service (SMS)

The total number of short message service (SMS) generated across the various networks in the second quarter of 2016 rose by 5.3%, expanding from the first quarter total of 485.69 million, ending the second quarter with a total of 511.85 million SMS (Table 5). The increase in the SMS traffic may be attributable to the upsurge in application to person (A2P) notifications. For instance, if a customer subscribes to SMS alert from a bank and receive SMS notification when there is a transaction on the bank account, this is an example of an application to person SMS.

The growth pattern in SMS traffic has been fairly stable (average 3.3%) for the past 4 quarters since it recorded a sharp decline in the third quarter of 2015 (Figure 5).

Year-on-year SMS growth however declined by 25.2% from 684.43 million during the second quarter of 2015 to 511.85 million at the end of the second quarter of 2016.

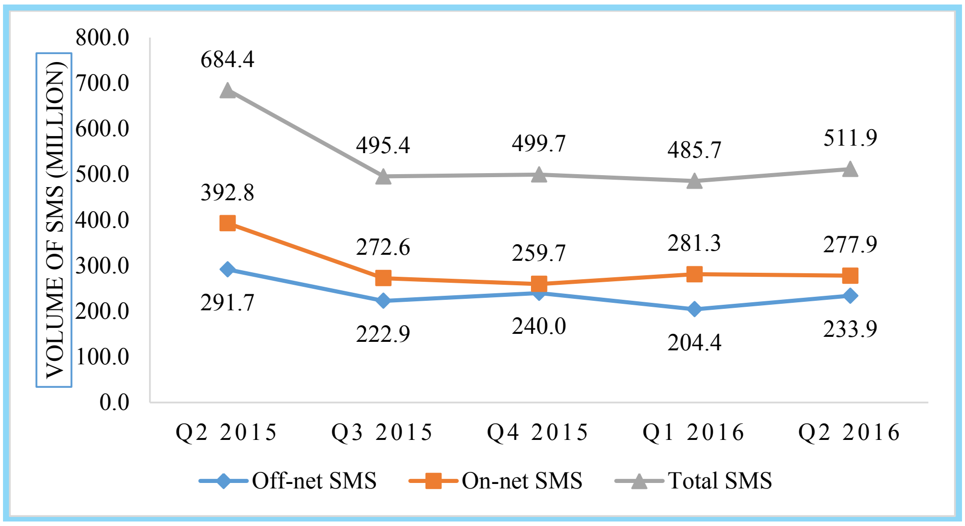
MTN recorded 200.88 million SMS, representing 39.2% of total SMS for the second quarter of 2016. Vodafone had 141.52 million SMS (27.6%) with Tigo carrying 109.49 million SMS (21.3%). Airtel and Glo total volumes of SMS was 55.57 million and 4.37 million representing 10.8% and 0.8% respectively (Table 5). Expresso did not report on the SMS transactions for the period under review.

Table 5: Total number of SMS per mobile network operator

Mobile Operators	Q2 2015	Q3 2015	Q4 2015	Q1 2016	Q2 2016
	Off-net SMS				
MTN	73,335,792	81,516,694	81,810,904	78,905,652	88,794,140
Vodafone	127,793,724	51,757,738	56,500,441	50,471,063	57,089,493
Tigo	45,628,360	37,668,673	43,860,991	50,347,010	44,476,299
Airtel	38,124,937	44,584,503	54,163,483	21,816,756	39,500,452
Glo	6,711,912	6,057,005	3,645,322	2,903,232	4,082,610
Expresso	83,913	1,286,475	38,519	-	-
Total	**291,678,638**	**222,871,088**	**240,019,660**	**204,443,713**	**233,942,994**
	On-net SMS				
MTN	225,014,118	103,346,119	102,030,573	93,791,420	112,089,090
Vodafone	74,943,305	85,234,238	53,592,693	88,531,025	84,439,040
Tigo	82,632,869	70,852,730	93,728,877	89,484,263	65,019,211
Airtel	8,866,073	12,104,646	9,847,445	9,027,249	16,078,366
Glo	1,297,153	1,033,692	454,662	418,743	290,174
Expresso	3,556	4,046	8,709	-	-
Total	**392,757,074**	**272,575,471**	**259,662,959**	**281,252,700**	**277,915,881**
	Total SMS				
MTN	298,349,910	184,862,813	183,841,477	172,697,072	200,883,230
Vodafone	202,737,029	136,991,976	110,093,134	139,002,088	141,528,533
Tigo	128,261,229	108,521,403	137,589,868	139,831,273	109,495,510
Airtel	46,991,010	56,689,149	64,010,928	30,844,005	55,578,818
Glo	8,009,065	7,090,697	4,099,984	3,321,975	4,372,784
Expresso	87,469	1,290,521	47,228	-	-
Total	**684,435,712**	**495,446,559**	**499,682,619**	**485,696,413**	**511,858,875**

Source: NCA; Mobile Network Operators, 2016

Figure 5: Total number of SMS per operator

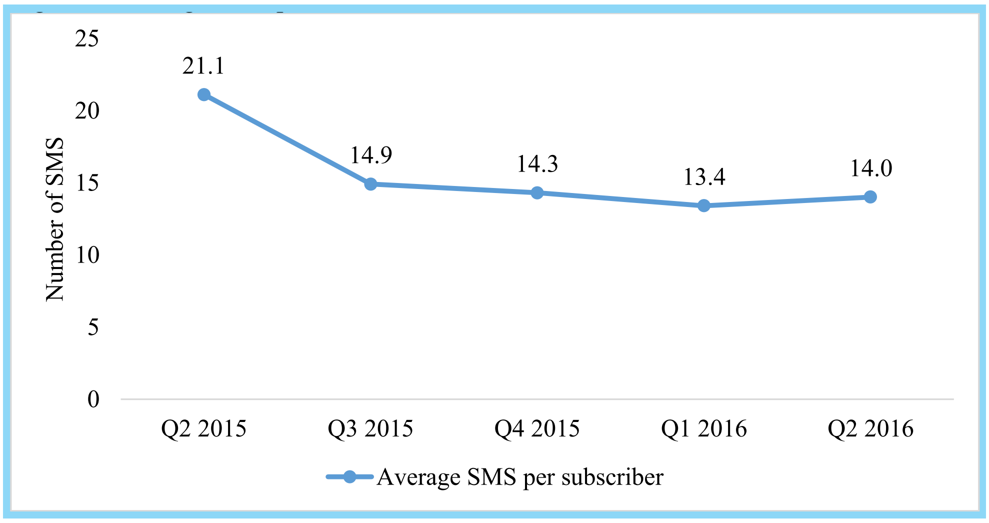


Source: NCA; Mobile Network Operators, 2016

2.4.1 Average SMS per subscriber

Quarter-on-quarter average SMS per subscriber increased by 4.4% in the second quarter of 2016 from an average of 13.4 SMS per subscriber in the first quarter to 14.0 SMS in the second quarter (Figure 6). The second quarter presents a slight improvement over the decline in number of SMS observed between Q3 2015 and Q1 2016.

Figure 6: Average SMS per subscriber



Source: NCA; Mobile Network Operators, 2016

2.5 Mobile telecommunication service tariffs

Tariffs for all mobile telecommunication services on the average remained unchanged between the first and second quarters of 2016. Average on-net mobile tariff (voice) was 11 pesewas per minute with off-net mobile tariff (voice) priced at 13 pesewas per minute (Table 6). Average on-net SMS tariff and off-net SMS tariff remained at 5 pesewas and 6 pesewas respectively. Tariff for data usage also remained at an average of 11 pesewas per megabyte (11GHP/mb).

The year-on-year information as reported by the various operators, however shows that all the tariffs increased by 1 pesewa (Table 6).

Table 6: Average tariff per service (GHp)

Tariff	Q2 2015	Q3 2015	Q4 2015	Q1 2016	Q2 2016
Average on-net mobile tariff (Pesewas)	10	10	10	11	11
Average off-net mobile tariff (Pesewas)	12	12	12	13	13
Average on-net SMS tariff (Pesewas)	4	4	5	5	5
Average off-net SMS tariff (Pesewas)	5	5	5	6	6
Average data/Mb tariff (Pesewas)	10	10	11	11	11

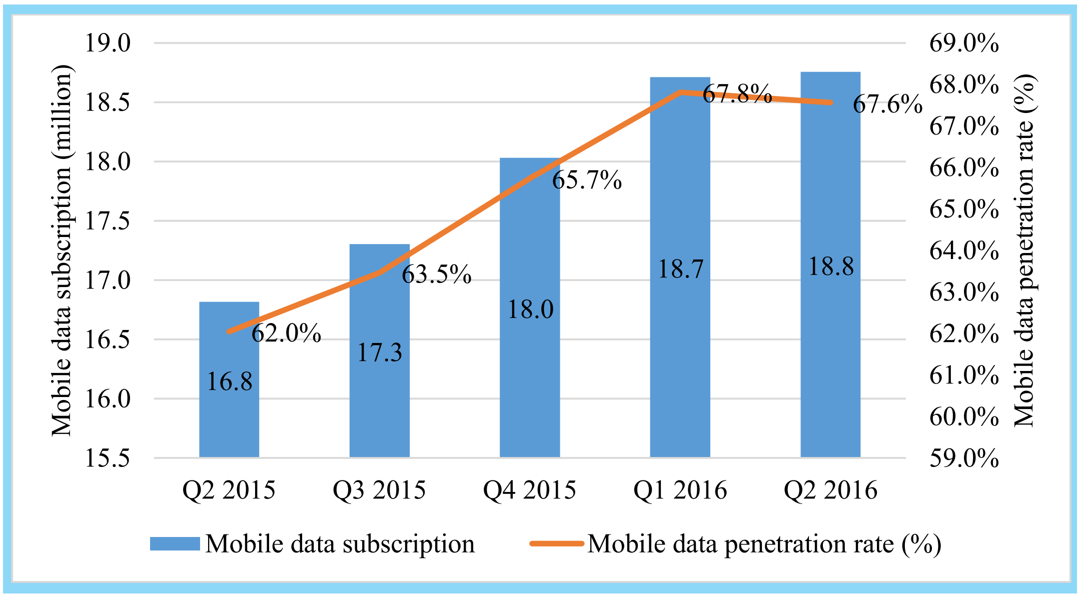
Source: NCA; Mobile Network Operators, 2016

2. 6 Mobile data subscription and penetration

Mobile data uptake in Ghana has been increasing steadily over the past five quarters, although it recorded a slower growth during the quarter under review. The quarter-on-quarter mobile data subscription expanded by 0.2% (increased from 18.7 million to 18.8 million), the lowest in the past five quarters (Figure 7). Total mobile data penetration rate for the country was 67.6%, 0.02% lower than the 67.8% data penetration for the first quarter of 2016.

The total mobile data subscription was up by 11.5% year-on-year, increasing from 16.8 million during the second quarter of 2015 to 18.8 million at the end of the second quarter of 2016, with a net addition of 1.9 million subscribers. (Figure 7).

Figure 7: Mobile data subscription and penetration rate (%)



Source: NCA; Mobile Network Operators, 2016

2. 6.1 Mobile data subscription per operator

During the second quarter of 2016, two operators (MTN and Tigo) recorded positive net mobile data subscriptions, whereas the remaining four (Vodafone, Airtel, Glo and Expresso) experienced net subscriber losses. MTN and Tigo's mobile data subscription increased by a net 303,002 and 8,612 on a quarter-on-quarter basis and 1,241,277 and 143,146 year-on-year respectively (Table 7). Airtel experienced the highest loss in quarter-on-quarter net subscription (119,075) followed by Vodafone (118,486) and Glo (27,365) with Expresso also recording net loss of 2,595.

At the end of the second quarter of 2016, MTN had 50.0% market share with total mobile data subscription of 9,369,407 followed by Vodafone with 3,271,790(17.4%), with Airtel occupying the third spot with 3,058,545 (16.3%). Tigo is the fourth largest operator in terms of mobile data subscription with customer base of 2,716,023 (14.5%), Glo ended the quarter with 298,622 mobile data subscriber (1.6%) and Expresso had the least subscription of 41,541 (0.2%) at the end of the second quarter of 2016 (Table 7).

Table 7: Mobile data subscription per operator

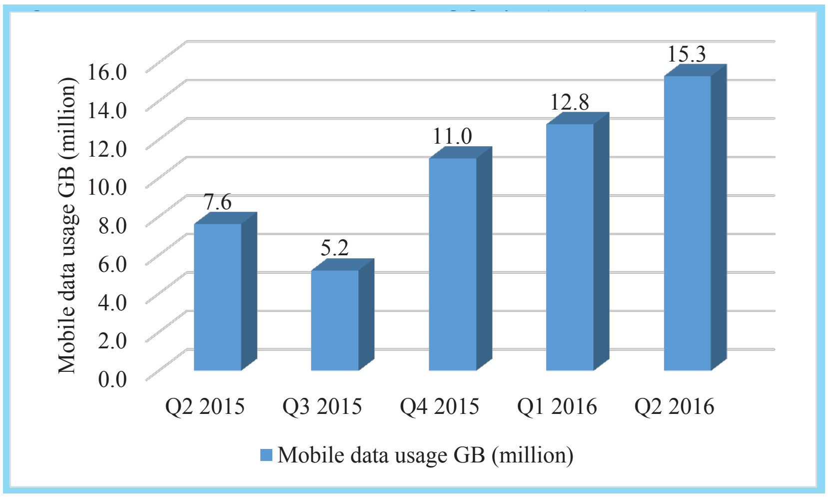
Mobile Network Operator		Q2 2015	Q3 2015	Q4 2015	Q1 2016	Q2 2016
MTN	Subscription	8,128,130	8,298,114	8,634,914	9,066,405	9,369,407
	Market Share (%)	*48.3*	*48.0*	*47.9*	*48.5*	*50.0*
Vodafone	Subscription	2,995,917	3,148,350	3,316,343	3,390,276	3,271,790
	Market Share (%)	*17.8*	*18.2*	*18.4*	*18.1*	*17.4*
Tigo	Subscription	2,572,877	2,615,347	2,732,863	2,707,411	2,716,023
	Market Share (%)	*15.3*	*15.1*	*15.2*	*14.5*	*14.5*
Airtel	Subscription	2,486,877	2,700,430	2,879,431	3,177,620	3,058,545
	Market Share (%)	*14.8*	*15.6*	*16.0*	*17.0*	*16.3*
Glo	Subscription	586,819	496,332	419,459	325,987	298,622
	Market Share (%)	*3.5*	*2.9*	*2.3*	*1.7*	*1.6*
Expresso	Subscription	45,514	45,323	48,178	44,136	41,541
	Market Share (%)	*0.3*	*0.3*	*0.3*	*0.2*	*0.2*
Total		**16,816,134**	**17,303,896**	**18,031,188**	**18,711,835**	**18,755,928**

Source: NCA; Mobile Network Operators, 2016

2. 6.2 Mobile data traffic

Mobile data usage has been increasing steadily in Ghana since the third quarter of 2015, consistent with the increase in mobile data subscription. Total volume of mobile data usage expanded by 19.5% during the second quarter of 2016, increasing from 12.8 million gigabytes (GB) to 15.3 million gigabytes (Figure 8). The year-on-year data consumption more than doubled (100.9%), growing from 7.6 million gigabytes in the second quarter of 2015 to 15.3 million gigabytes at the end of June 2016.

Figure 8: Mobile data traffic in millions of gigabyte (GB)

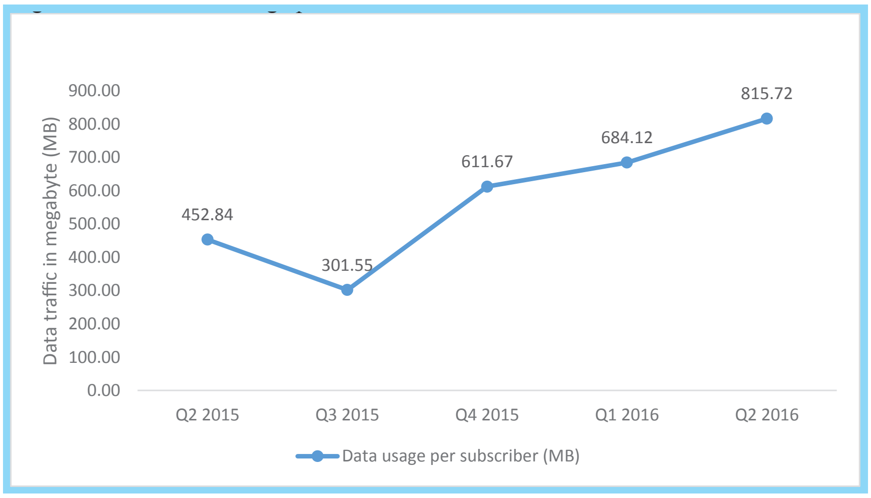


Source: NCA; Mobile Network Operators, 2016

2.6.3 Mobile data usage per subscriber

The average monthly data usage per subscriber increased by 19.2% quarter-on-quarter, growing from 684.12 megabytes (MB) in the first quarter of 2016 to 815.72 megabytes at the end of June 2016 (Figure 9).

Figure 9: Mobile data usage per subscriber (MB)



Source: NCA; Mobile Network Operators, 2016

2.6.4 Mobile data traffic per operator

During the second quarter of 2016, MTN accounted for 41.4% of the total data usage in Ghana with 6.33 million gigabytes of data followed by Vodafone with 3.99 million gigabytes (26.1%) data usage (Table 8). Airtel was the third largest player, with a market share of 23.1% and data volume of 3.53 million gigabytes .Tigo and Glo accounted for 8.8% and 0.6% of total volume of data consumption respectively, with data volumes of 1.31 million gigabytes and 89 thousand gigabytes.

Table 8: Mobile data traffic (GB) per operator

Mobile Operator	Data Usage (GB)	Q2 2015	Q3 2015	Q4 2015	Q1 2016	Q2 2016
MTN	Data Usage (GB)	2,758,496.03	2,224,110.16	3,828,998.22	4,606,691.59	6,187,603.59
	Market Share (%)	*37.1*	*43.6*	*35.6*	*36.9*	*41.4*
Vodafone	Data Usage (GB)	1,969,067.33	954,792.88	3,606,482.64	3,856,198.78	3,905,873.86
	Market Share (%)	*26.5*	*18.7*	*33.5*	*30.8*	*26.1*
Tigo	Data Usage (GB)	865,961.89	1,120,902.40	959,476.94	1,126,398.71	1,310,040.32
	Market Share (%)	*11.6*	*22.0*	*8.9*	*9.0*	*8.8*
Airtel	Data Usage (GB)	1,799,557.57	732,420.36	2,361,873.44	2,879,226.50	3,448,326.87
	Market Share (%)	*24.2*	*14.4*	*21.9*	*23*	*23.1*
Glo	Data Usage (GB)	25,172.31	21,633.17	13,853.12	32,624.35	89,151.17
	Market Share (%)	*0.3*	*0.4*	*0.1*	*0.3*	*0.6*
Expresso	Data Usage (GB)	18,229.00	41,761.82	-	-	-
	Market Share (%)	*0.2*	*0.8*	-	-	-
Total Industry Traffic (GB)		**7,436,484.14**	**5,095,620.78**	**10,770,684.36**	**12,501,139.93**	**14,940,995.81**

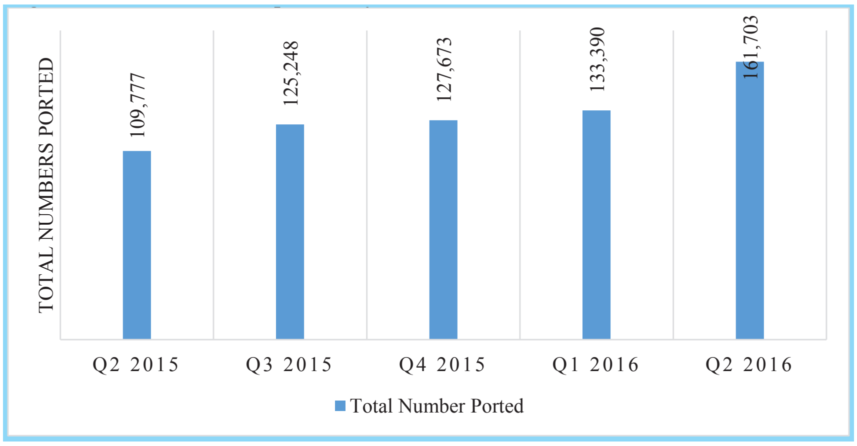
Source: NCA; Mobile Network Operators, 2016

2.7 Mobile Number Portability (MNP)

Promoting and sustaining competition in the communications sector is central to the regulatory policies of the National Communications Authority (NCA). This is aimed at stimulating innovation and investment in the communications sector, to the ultimate benefit of the Ghanaian consumer. 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. Mobile number portability in Ghana started in July 2011.

During the second quarter of 2016, a total of 161,703 ported their mobile numbers from one service provider to another (Figure 10). This represents an increase of 21.2% quarter-on-quarter and 47.3% year-on-year for the 133,390 and 109,777 numbers ported in the previous periods respectively. The total number ported in the second quarter (161,703) represents 0.44% of the total mobile subscription (36,613,987) during that period which is slightly above the 0.33% for the first quarter of 2016.

Figure 10: Mobile number portability



Source: NCA; PortingXS, 2016

3.0 BROADBAND WIRELESS ACCESS (BWA)

3.1 BWA subscription and penetration

This section assesses the dynamics of the broadband wireless access (BWA) sector in the Ghanaian telecommunications industry. Four BWAs have been licensed by the NCA but three are currently operational in Ghana offering various broadband internet services. The licensed BWAs are:

i. Surfline
ii. BLU
iii. Broadband Home (BBH) [Fomerly Zipnet]
iv. Goldkey (not operational yet)

The focus of the discussion is mainly on metrics such as subscription and data traffic over the period under review for Surfline, BLU and BBH, the three service providers that are operational.

For the second quarter of 2016, the total number of subscribers was 109,124, indicating growth of 7.1% over the 101,851 total subscription in the first quarter of 2016. Year-on-year subscription recorded growth rate of 31.2%, increasing from 83,201 subscribers in 2015 to 109,124 subscribers at the end of June 2016 (Table 9).

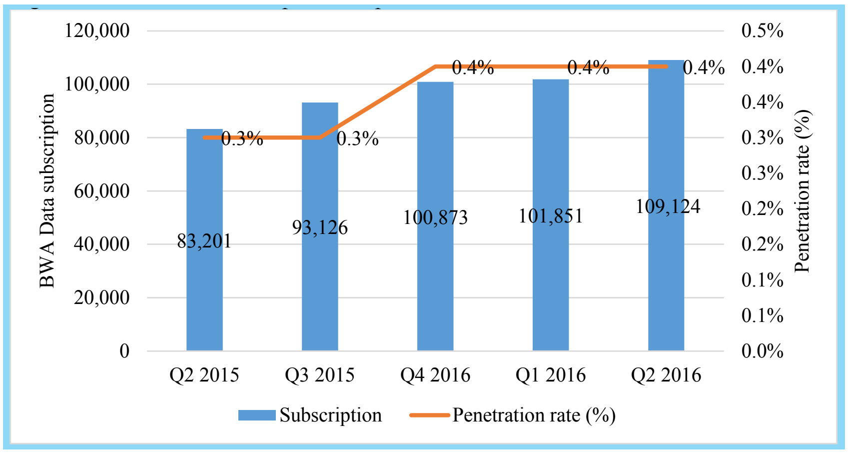
Broadband Wireless Access penetration rate in Ghana remained at 0.4% for three consecutive quarters (Figure 11).

Table 9: BWA data subscription and penetration rate

BWA Operator	Q2 2015	Q3 2015	Q4 2015	Q1 2016	Q2 2016
Subscription	83,201	93,126	100,873	101,851	109,124
Growth rate (%)	*136.9*	*11.9*	*8.3*	*1.0*	*7.1*
Population	27,102,372	27,265,312	27,429,231	27,594,136	27,760,032
Penetration rate (%)	*0.3*	*0.3*	*0.4*	*0.4*	*0.4*

Source: NCA; Broadband Wireless Access Operators, 2016

Figure 11: BWA data subscription and penetration



Source: NCA; Broadband Wireless Access Operators, 2016

3.1.1 Subscription per BWA Operator

Surfline is the largest BWA operator in Ghana by subscription, leading the market with a share of 74.5% and 81,325 subscribers as at the end of June 2016. BBH is the second largest BWA operator with 26,536 subscribers (24.3%), and the remaining market is covered by BLU Telecoms with total subscribers of 1,263 (1.2%) (Table 10).

With the exception of Surfline which recorded a positive quarter-on-quarter growth (10.2%) in subscription, BBH and BLU Telecom lost 0.5% and 9.5% of their subscriber base respectively. The growth in subscription in the BWA industry as a whole, was 7.1% quarter-on-quarter and 31.2% year-on-year respectively (Table 10).

Table 10: Subscription per Broadband Wireless Access (BWA) operator

BWA operator		**Q2 2015**	**Q3 2015**	**Q4 2016**	**Q1 2016**	**Q2 2016**
Surfline	Subscription	53,628	64,714	72,607	73,789	81,325
	Market share (%)	*64.5*	*69.5*	*72.0*	*72.4*	*74.5*
BBH	Subscription	26,910	26,748	26,786	26,666	26,536
	Market share (%)	*32.3*	*28.7*	*26.6*	*26.2*	*24.3*
BLU	Subscription	2,663	1,664	1,480	1,396	1,263
	Market share (%)	*3.2*	*1.8*	*1.5*	*1.4*	*1.2*
Industry total		**83,201**	**93,126**	**100,873**	**101,851**	**109,124**

Source: NCA; Broadband Wireless Access Operators, 2016

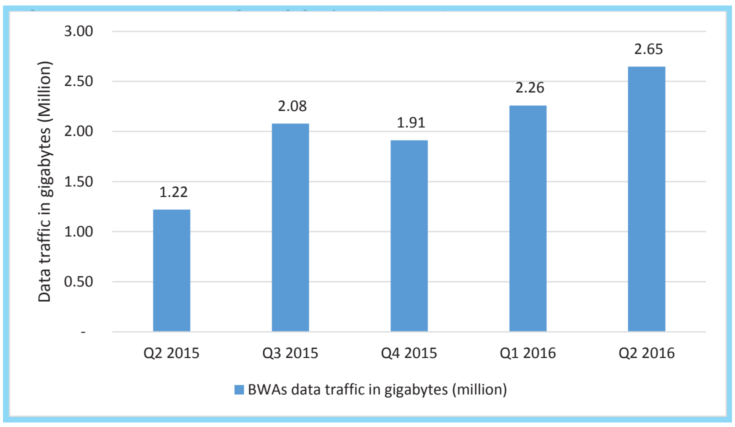
3.2 Broadband Wireless Access (BWA) volume of data traffic

Broadband provides enough transmission capacity and speed for high quality voice, data and video applications and is considered as an accelerator of economic and social development. Sustained growth in the uptake of broadband data is desirable for the Ghanaian economy.

Total volume of broadband data traffic increased by 17.2% quarter-on-quarter, growing from 2.26 million gigabytes (GB) in the first quarter of 2016 to 2.65 million gigabytes at the end of the second quarter (Figure 12).

The year-on-year volume of broadband data traffic grew significantly (117.2%), increasing from 1.22 million gigabytes to 2.65 million gigabytes between 2015 and 2016.

Figure 12: BWA data usage in gigabytes (million)



Source: NCA; Broadband Wireless Access Operators, 2016

3.2.1 *Volume of broadband data traffic per operator*

Surfline generated 2,253,167.49 gigabytes of broadband data traffic, representing 85.1% of the total volume of data traffic in the second quarter of 2016. This was followed by BBH, with 291,928.83 gigabytes of traffic (11.0%) (Table 11). The total volume of data traffic generated by BLU telecoms was 103,878.55 gigabytes, constituting 3.9% of the total volume of broadband data traffic for the second quarter of 2016.

Table 11: Data traffic (GB) per Broadband Wireless Access (BWA) operator

BWA operator		**Q2 2015**	**Q3 2015**	**Q4 2015**	**Q1 2016**	**Q2 2016**
Surfline	Data usage (GB)	1,171,852.68	1,684,993.62	1,590,405.36	1,851,101.97	2,253,167.49
	Market share (%)	*96.0*	*81.0*	*83.2*	*81.9*	*85.1*
BBH	Data usage (GB)	0.36	257,910.00	200,494.37	280,747.23	291,928.83
	Market share (%)	*0.0*	*12.4*	*10.5*	*12.4*	*11.0*
BLU	Data usage (GB)	49,142.27	137,060.62	120,615.79	127,965.99	103,878.55
	Market share (%)	*4.0*	*6.6*	*6.3*	*5.7*	*3.9*
Industry Total (GB)		**1,220,995.32**	**2,079,964.24**	**1,911,515.52**	**2,259,815.19**	**2,648,974.87**

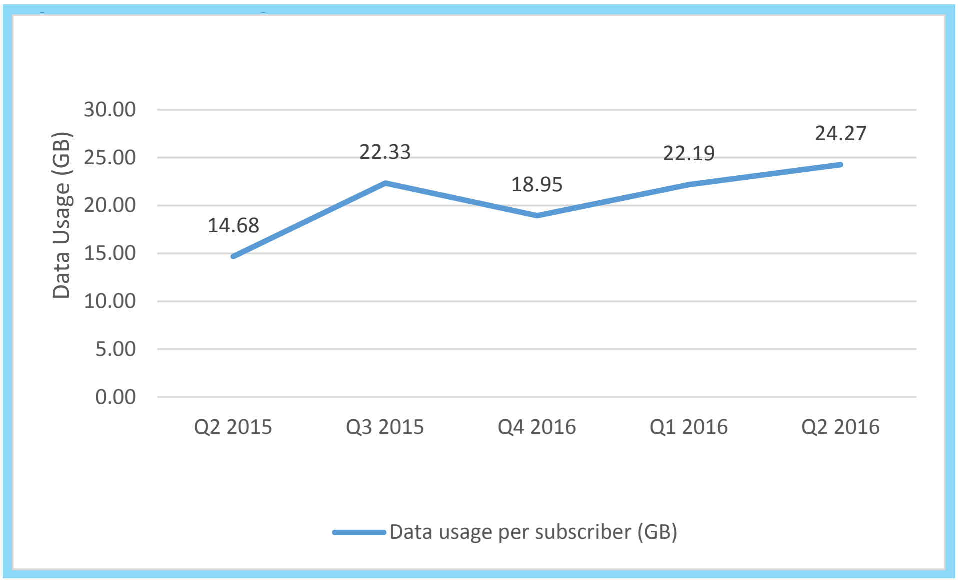
Source: NCA; Broadband Wireless Access Operators, 2016

3.2.2 *Monthly data usage per BWA subscriber*

Monthly broadband data usage per subscriber is a metric which provides insight into how much volume of data is consumed by an average user.

Broadband data usage per subscriber increased by 9.4%, expanding from 22.19 gigabytes in the first quarter of 2016 to 24.27 gigabytes in the second quarter of 2016 (Figure 13).

Figure 13: Data usage per BWA subscriber (GB)



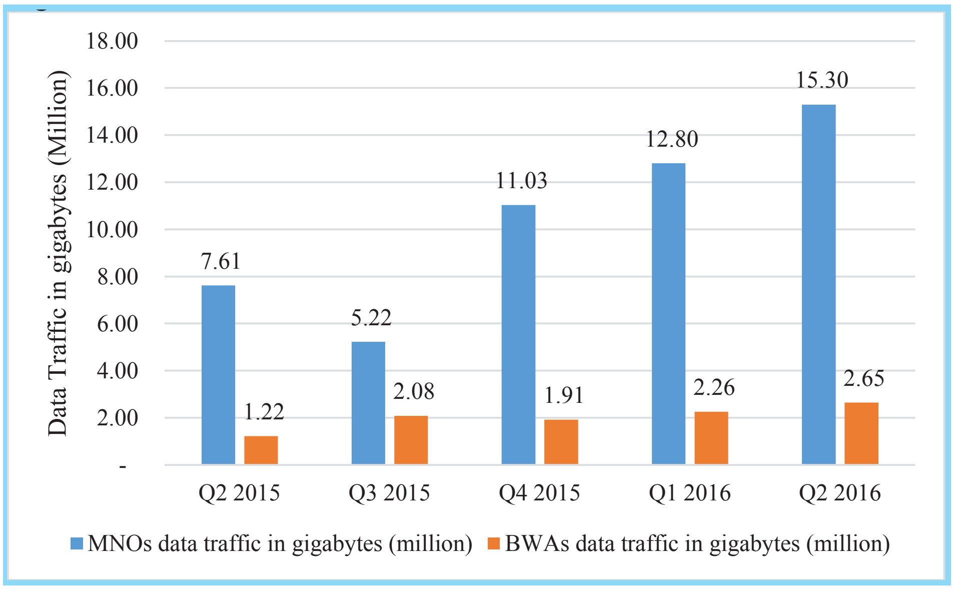
Source: NCA; Broadband Wireless Access Operators, 2016

3.3 Monthly data traffic for MNOs versus BWAs

The six mobile network operators offer data services to their subscribers using 3G services (MTN has started 4G services since June 2016) in addition to the voice services, whereas the Broadband Wireless Access operators offer 4G data services only. This section provide a synopsis of the total volume of data traffic generated by the MNOs as compared to the BWA operators.

During the second quarter of 2016, the MNOs carried a total of 15.30 million gigabytes of data traffic compared to 2.65 million gigabytes data generated by the BWAs (Figure 14).

Figure 14: Data traffic for MNOs and BWAs



Source: NCA, 2016

4.0 FIXED NETWORK

This section reports on fixed telephone voice and data subscription, and traffic volumes for the period under review. Currently, two operator (Vodafone and Airtel) are offeing fixed telephone services in the country. MTN has also been issued with a provisional fixed telephone lincence by the National Communications Authority since 2015, although, the company is yet to begin commercial fixed line operation.

4.1 Fixed Network Subscription and penetration

Fixed line subscription continues to dwindle as it recorded losses for the second quarter in succession. Total fixed line subscription reduced to 256,653 from the previous quarter's figure of 258,536, a reduction of 0.7% (Table 12).

Vodafone continues to hold a greater share (96.8%) of the total market, with a subscriber base of 248,536. However, Airtel had few additions to its subscriber base, increasing its market share by 0.1% to bring its total market share to 3.2% with total subscription of 8,117 at the end of the second quarter of 2016 (Table 12).

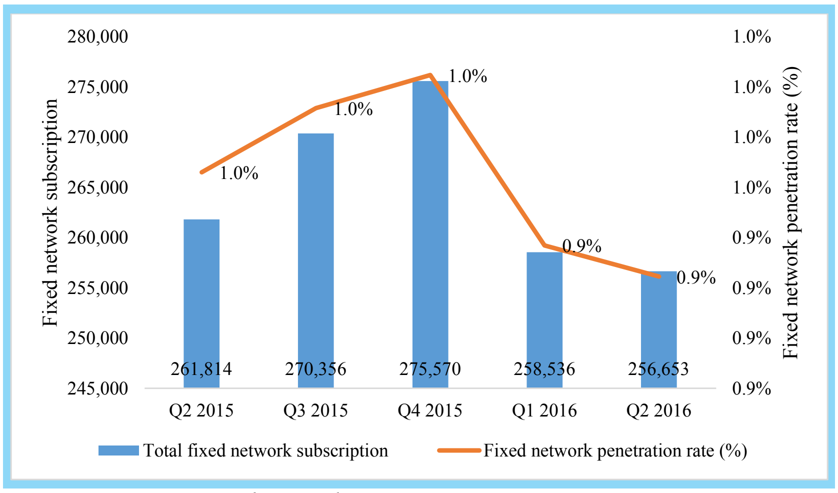
Fixed network penetration rates further declined to 0.92% from a previous quarter rate of 0.94% (Figure 15).

Table 12: Fixed networks subscription per operator

Fixed Operator	Subscription	Q2 2015	Q3 2015	Q4 2015	Q1 2016	Q2 2016
Vodafone	Subscription	253,627	262,109	267,161	250,546	248,536
	Market share (%)	*96.9*	*96.9*	*96.9*	*96.9*	*96.8*
Airtel	Subscription	8,187	8,247	8,409	7,990	8,117
	Market share (%)	*3.1*	*3.1*	*3.1*	*3.1*	*3.2*
Total industry subscription		**261,814**	**270,356**	**275,570**	**258,536**	**256,653**
Population		27,102,372	27,265,312	27,429,231	27,594,136	27,760,032
Fixed network penetration rate (%)		*0.97*	*0.99*	*1.00*	*0.94*	*0.92*

Source: NCA; Fixed Network Operators, 2016

Figure 15: Fixed network penetration rate



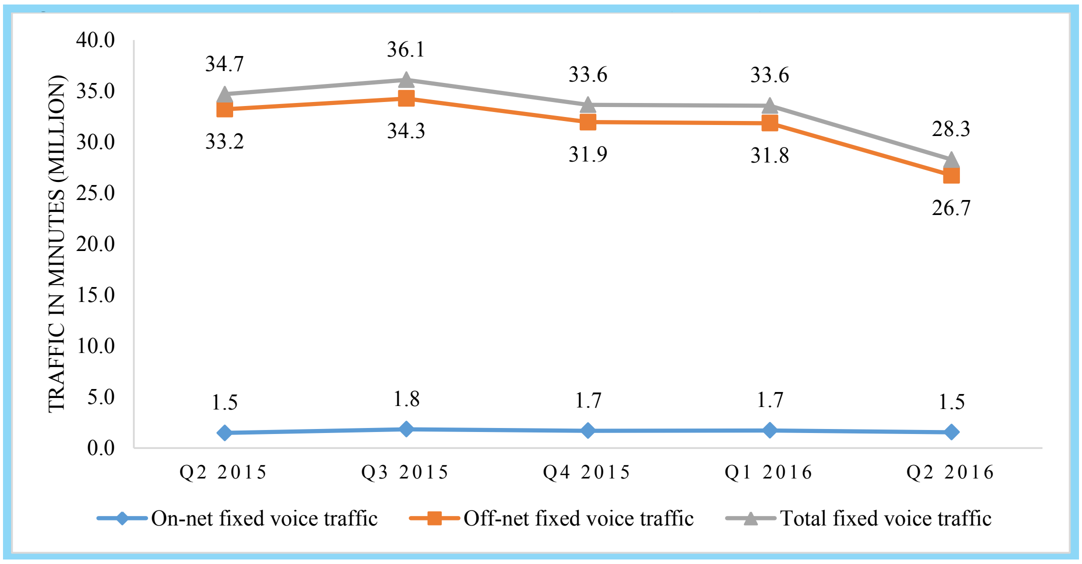
Source: NCA; Fixed Network Operators, 2016

4.2 Fixed Network Traffic

The volume of traffic from fixed networks decreased by 15.7% in the second quarter of 2016 (Figure 16). Total volume of traffic was 28.3 million minutes in the second quarter of 2016, a shortfall of 5.5 million minutes from the 33.8 million minutes in the first quarter of 2016.

The year-on-year traffic by fixed networks also declined by 18.4%, shrinking from 34,680,597 minutes in the second quarter of 2015 to 28,270,774 in the second quarter of 2016 (Figure 16).

Figure 16: Fixed network volume of traffic in minutes (million)



Source: NCA; Fixed Network Operators, 2016

4.2.1 Fixed network traffic per operator

The year-on-year total on-net fixed traffic increased from 1.47 million minutes to 1.54 million. Vodafone share of the total on-net fixed traffic decreased from 98.0% to 96.9% (Table 13). Total off-net fixed voice traffic decreased by 19.5%, from 33.21 million minutes to 26.73 million minutes year-on-year. The share of Airtel in both on-net and off-net fixed traffic has increased year-on-year between the second quarter of 2015 and 2016.

Table 13: Fixed networks volume of traffic per operator (minutes)

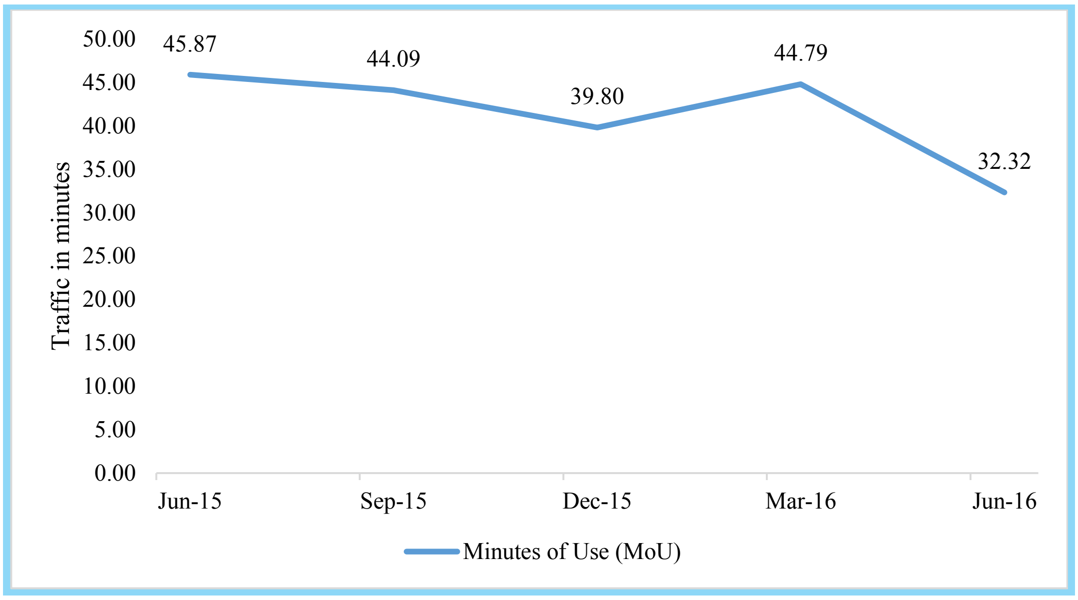
Fixed network operator	Traffic	Q2 2015	Q3 2015	Q4 2015	Q1 2016	Q2 2016
	On-net traffic					
Vodafone	On-net traffic	1,440,754	1,808,196	1,671,595	1,684,219	1,494,630
	Market share (%)	*98*	*98.4*	*98.5*	*97.6*	*96.9*
Airtel	On-net traffic	28,989	29,623	24,821	41,968	47,725
	Market share (%)	*2*	*1.6*	*1.5*	*2.4*	*3.1*
Total on-net traffic		**1,469,743**	**1,837,819**	**1,696,416**	**1,726,187**	**1,542,355**
	Off-net traffic					
Vodafone	Off-net traffic	30,764,258	31,218,020	29,075,679	29,518,113	24,003,745
	Market share (%)	*92.6*	*91.1*	*91*	*92.7*	*89.8*
Airtel	Off-net traffic	2,446,596	3,035,271	2,871,117	2,318,866	2,724,674
	Market share (%)	*7.4*	*8.9*	*9*	*7.3*	*10.2*
Total off-net traffic		**33,210,854**	**34,253,292**	**31,946,796**	**31,836,979**	**26,728,419**
	Total traffic					
Vodafone	Total traffic	32,205,012	33,026,217	30,747,274	31,202,332	25,498,375
	Market share (%)	*92.9*	*91.5*	*91.4*	*93*	*90.2*
Airtel	Total traffic	2,475,585	3,064,894	2,895,938	2,360,834	2,772,399
	Market share (%)	*7.1*	*8.5*	*8.6*	*7*	*9.8*
Total fixed network traffic		**34,680,597**	**36,091,111**	**33,643,212**	**33,563,166**	**28,270,774**

Source: NCA; Fixed Network Operators, 2016

4.3 Fixed network minutes of use

Minutes of Use (MoU) on fixed networks decreased by 27.8% in the second quarter of 2016 (Figure 17). The first quarter 2016 minutes of use was 44.79 minutes with that of the end of the second quarter declining to 32.32 minutes. Year-on year figures were similar, showing a negative growth of 29.5%, declining from 45.87 minutes in June 2015 to 32.32 minutes in June 2016.

Figure 17: Fixed networks minutes of use (MoU)



Source: NCA; Fixed Network Operators, 2016

4.4 Fixed Data Subscription

Fixed data subscription has seen an increasing trend in the past year and this continued into the second quarter of 2016 with quarter-on-quarter total subscription increasing to 84,343 from the previous quarter's figure of 77,312 representing a growth rate of 9.09% (Table 14). The year-on-year fixed data subscription also grew by about 24% from the previous year's figure of 68,011 to 84,343 at the end of June 2016.

Vodafone controls majority (98.1%) of the total fixed data market share with Airtel contributing the remaining 1.9%.

Table 14: Fixed networks data subscription

Fixed network operator	Data subscription	Q2 2015	Q3 2015	Q4 2015	Q1 2016	Q2 2016
Vodafone	Data subscription	66,362	67,729	73,464	75,738	82,745
	Market share (%)	*97.6*	*97.6*	*97.8*	*98.0*	*98.1*
Airtel	Data subscription	1,649	1,696	1,628	1,574	1,598
	Market share (%)	*2.4*	*2.4*	*2.2*	*2.0*	*1.9*
Total fixed data subscription		68,011	69,425	75,092	77,312	84,343

Source: NCA; Fixed Network Operators, 2016

5.0 BROADCASTING

Broadcasting comprises the Frequency Modulation (FM) and Television (TV) authorisations. This section provides information on the total number of applications received, total stations authorised and total stations operational. It also assesses the distribution of the FM and TV stations by region and by type of station.

5.1 Total FM and TV applications and authorisations

Since the establishment of the National Communications Authority in 1996, a total of 1,161 applications have been submitted to the Authority, for Frequency Modulation (FM) radio authorisation (Table 15). Out of this total applications received, the total number of FM stations authorised as at the end of June 2016 was 448, out of which 345 are operational.

The total number of Television authorisation requests received by the NCA between 1996 and June 2016 is 259, out of which 76 authorisations have been issued (table 15). As at the end of June 2016, the total number of Television stations on air was 34, representing 44.7% of the authorised television stations.

Table 15: Total FM and TV applications and authorisations as at end of Q2 2016

	Application	FM Radio	Television
1	Total number of applications received by NCA as at June 30, 2016	1,161	259
2	Total number of authorisations issued as at June 30, 2016	448	76
3	Total number of stations operational as at June 30, 2016	345	34

Source: NCA, 2016

5.2 Authorised Frequency Modulation (FM) radio stations

The second quarter of 2016 has seen the NCA authorising 15 Frequency Modulation (FM) radio stations in Ghana. This brings the total number of FM radio authorisation to 433 at the end of the second quarter of 2016 (Table 16).

Western Region received the highest number of authorisation in the year under review increasing the total number of authorised radio stations in that region to 78 compared to 74 in the previous quarter, followed by Brong Ahafo (59), Ashanti (58).

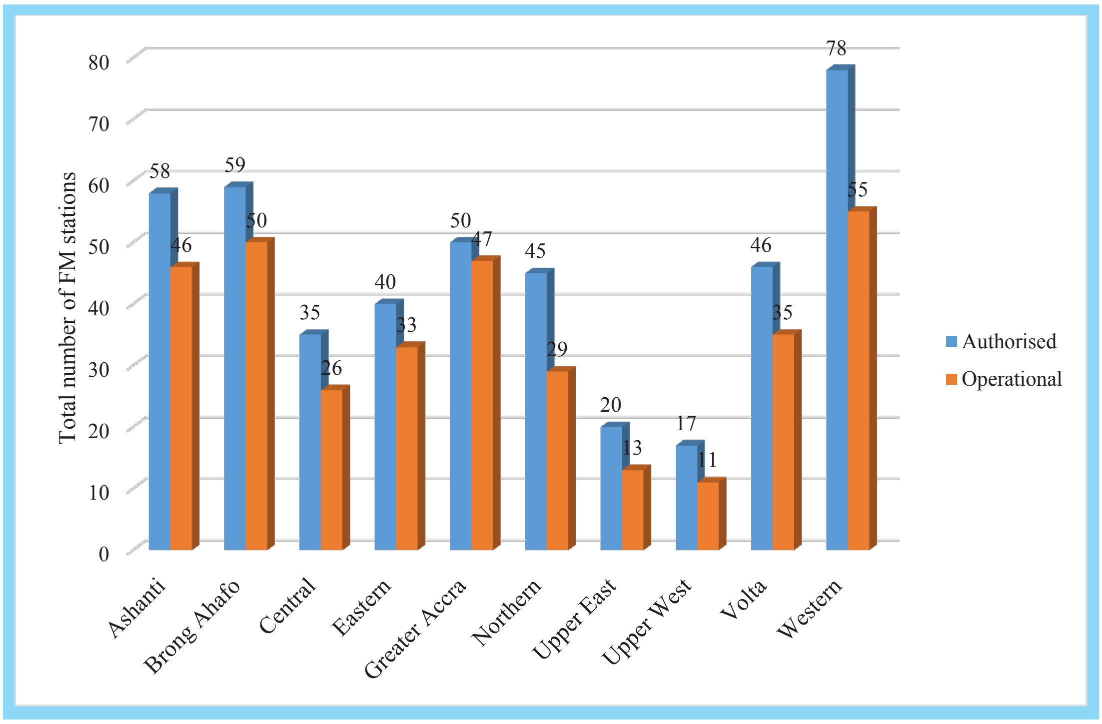
The Region with the highest number of FM stations that are operational is Western Region (55) followed by Brong Ahafo Region (50). The region with the least number of FM radio stations that are operational is Upper West (11) (Figure 18).

Table 16: Regional distribution of FM stations as at the end of Q2 2016

Regions	Total no. of authorised FM stations as at end of Q1 2016	No. of FM stations authorised in Q2 2016	Total no. of authorised FM stations as at end of Q2 2016	Total no. of FM stations in operation as at end of Q2 2016
Ashanti	57	1	58	46
Brong Ahafo	58	1	59	50
Central	32	3	35	26
Eastern	38	2	40	33
Greater Accra	49	1	50	47
Northern	44	1	45	29
Upper East	18	2	20	13
Upper West	17	0	17	11
Volta	46	0	46	35
Western	74	4	78	55
TOTAL	**433**	**15**	**448**	**345**

Source: NCA, 2016

Figure 18: Regional distribution of FM stations as at end of Q2 2016



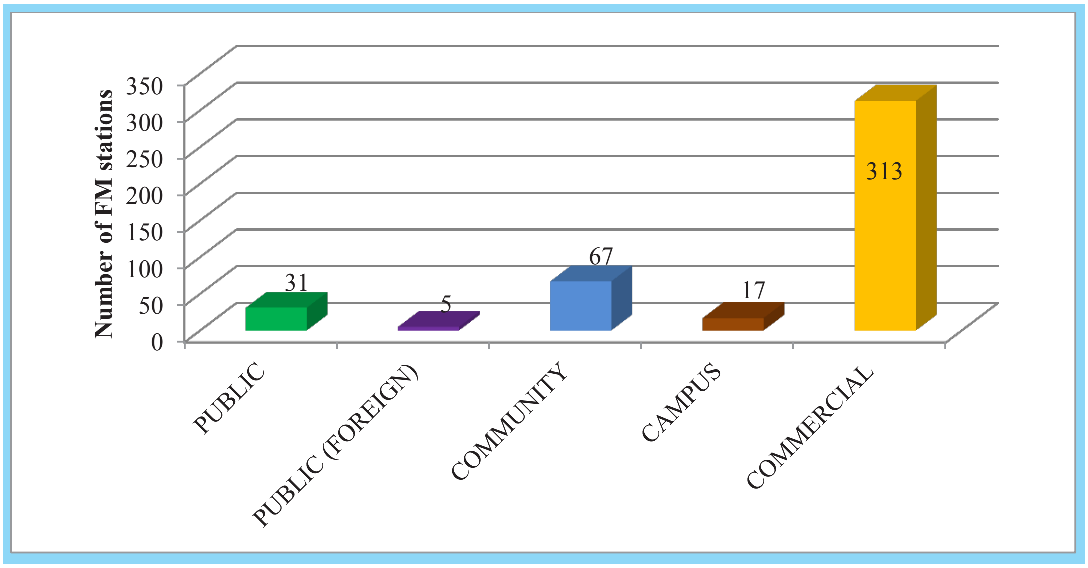
Source: NCA, 2016

Table 17: Authorised FM stations by type and region as at the end of Q2 2016

Name of Regions	Total no. Authorised	Public	Public (Foreign)	Community	Campus	Commercial
Ashanti	57	2	1	4	2	48
Brong Ahafo	58	3	-	6	2	48
Central	32	2	-	8	3	20
Eastern	38	2	-	6	1	29
Greater Accra	49	3	3	6	3	37
Northern	44	7	-	12	1	23
Upper East	18	2	-	4	1	9
Upper West	17	2	-	8	1	6
Volta	46	3	-	10	1	32
Western	74	5	1	5	2	61
Total	**433**	**31**	**5**	**67**	**17**	**313**

Source: NCA, 2016

Figure 19: Distribution of authorised FM radio stations by Type as at Q2 2016



Source: NCA, 2016

5.3 Authorised Television Stations

The total number of Television stations authorization issued by the NCA for the second quarter of 2016 was eight (8) (Table 18). The stations authorised are: Net 2 TV Limited, TV3 Network Limited and Crystal Radio vision Network Limited (Digital replacement authorisation). The rest are Nour Vision Ghana Limited (Digital Terrestrial Pay TV, Service and Frequency). There were also 4 authorizations in 'Satellite Television Broadcasting (Free-To-Air Direct-To-Home Single Channel) namely: Daily Television Limited, Kessben Television Limited, Rockland Network Limited and Obinim TV Limited.

The year-on-year authorised TV stations increased by 100%, appreciating from 4 stations authorised in the second quarter of 2015 to 8 in the current quarter (Table 18). Comparing the first and second quarters of 2016 also showed 100% increase in the number of TV authorizations across the country.

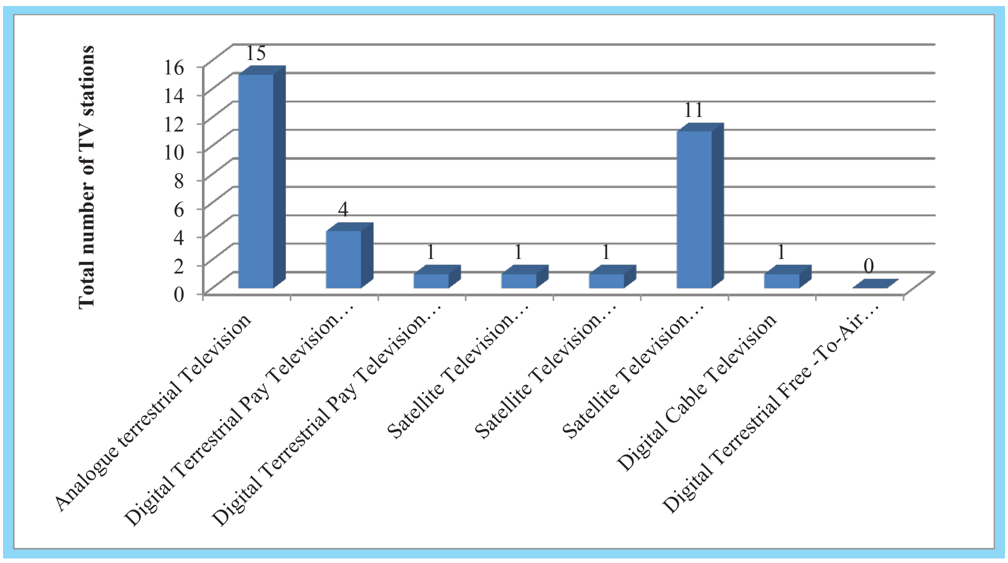
Out of the total number of 75 TV stations authorised in Ghana, 34 TV stations were operational at the end of the second quarter of 2016.

Table 18: Authorised TV stations in Ghana as at end of Q2 2016

Types of TV stations	Total no. of authorised TV stations as at end of Q1 2016	No. of TV stations authorised in Q2 2016	Total no. of authorised TV stations as at end of Q2 2016	Total no. of TV stations on air as at end of Q2 2016
Analogue Terrestrial Television	21	0	21	15
Digital Terrestrial Pay Television (Service only)	1	0	1	1
Digital Terrestrial Pay Television (Service and Frequency)	4	1	5	4
Satellite Television Broadcasting (Pay TV Direct-To-Home Bouquet)	7	0	7	1
Satellite Television Broadcasting (Free-To-Air Direct-To-Home Bouquet)	8	0	8	1
Satellite Television Broadcasting (Free-To-Air Direct-To-Home Single Channel)	25	4	29	11
Digital Cable Television	1	0	1	1
Digital Terrestrial Free-To-Air Television programme Network	0	4	4	0
Total	67	9	76	34

Source: NCA, 2016

Fgure 20: Total number of TV stations on air as at end of Q2 2016



Source: NCA, 2016

6.0 EQUIPMENT TYPE APPROVAL

Type Approval is granted to a product that meets a minimum set of regulatory, technical and safety requirements in Ghana. The main objective of type approval is to ensure that all electronic communications equipment that are used in Ghana comply with international standards that protect consumers from products that are hazardous and ensure that their operation do not affect in any way the normal functioning of other equipment or the health of people around the operational areas. Generally, type approval is required before a product is allowed to be sold in Ghana. Example of such equipment requiring type approval are mobile phones and laptops.

6.1 Total number of equipment certified

Total number of type approval issued by the NCA for various equipment in the second quarter was 57, which is lower than the total equipment (71) approved in the first quarter of 2016 (Table 19). Compared to the same period last year, the Authority issued type approval certificate for 88 different types of equipment, down by margin of 31 year-on-year.

Table 19: Total number of equipment type approval certificates issued

Type approval	Q2 2015	Q3 2015	Q4 2015	Q1 2016	Q2 2016
Total number of type approval issued	88	47	31	71	57

Source: NCA, 2016

7.0 CONCLUSION

Publication of regular, consistent and reliable statistics on the communications sector is important for the growth of the industry, as it stimulates competition, provide consumers and investors with decision making information and help monitor policy implications.

The total mobile subscription in Ghana increased by 1.3% from 36,138,706 in the first quarter of 2016 to 36,613,987 at the end of the second quarter of 2016. Mobile penetration also increased marginally from 131.0% in the first quarter of 2016 to 131.9% at the end of the second quarter of 2016. Domestic mobile voice traffic declined by 2.3% quarter-on-quarter from 15.05 billion minutes during the first quarter of 2016 to 14.80 billion minutes at the end of the second quarter of 2016. The total minutes of use per subscriber for the second quarter of 2016 was 134 minutes, 4 minutes lower (-2.9%) than the first quarter of 2016. The year-on-year volume of inbound international traffic fell by 17.7%, decreasing from 189.2 million minutes in the second quarter of 2015 to 155.8 million minutes in 2016. Similarly, outbound international traffic declined from 217.7 million minutes to 178.9 million minutes, a year-on-year decline of 17.8%. Total volume of mobile data usage expanded by 19.5% during the second quarter of 2016, increasing from 12.8 million Gigabytes to 15.3 million Gigabytes. During the second quarter of 2016, a total of 161,703 ported their mobile numbers from one service provider to another.

The total number of broadband internet subscription for the second quarter of 2016, as reported by the three (Surfline, BBH, BLU) broadband wireless operators was 109,124, indicating 7.1% quarter-on-quarter compared to the 101,851 at the end of the first quarter of 2016. Broadband penetration rate in Ghana remained at 0.4% for the second quarter of 2016. Total volume of broadband data traffic increased by 17.2% quarter-on-quarter, growing from 2.26 million gigabytes (GB) in the first quarter of 2016 to 2.65 million gigabytes at the end of the second quarter. Data usage per subscriber increased by 9.4%, expanding from 22.19 gigabytes in the first quarter of 2016 to 24.27 gigabytes in the second quarter of 2016. During the second quarter of 2016, the MNOs carried a total of 15.30 million gigabytes of data traffic compared to 2.65 million gigabytes data generated by the BWAs.

The total number of FM stations authorised as at the end of June 2016 was 448, out of which 345 are operational. The total number of FM stations authorised in the second quarter of 2016 was 15. Eight (8) television stations authorisations were issued during the second quarter of 2016.

APPENDICES

Appendix 1: Monthly mobile subscription in Ghana

Mobile Operators	Apr-15	May-15	Jun-15	Jul-15	Aug-15	Sep-15	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16
MTN	14,364,922	14,642,806	14,886,291	15,046,417	15,211,803	15,493,052	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
Vodafone	7,167,591	7,276,938	7,296,394	7,337,205	7,353,155	7,397,022	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
Tigo	4,395,609	4,446,059	4,490,078	4,509,354	4,452,988	4,479,898	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
Airtel	4,061,099	4,061,799	4,111,766	4,176,115	4,279,835	4,383,674	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
Glo	1,474,547	1,401,302	1,445,727	1,413,824	1,396,958	1,383,812	1,389,545	1,324,833	1,369,402	1,252,275	1,103,301	1,048,635	962,338	944,260	897,082
Expresso	126,202	132,698	132,855	132,234	131,666	132,982	126,546	127,217	125,263	121,113	115,058	110,549	108,292	106,082	103,960
Total	**31,589,970**	**31,961,602**	**32,363,111**	**32,615,149**	**32,826,405**	**33,270,440**	**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**

Appendix 2: Monthly prepaid mobile subscription

Mobile Operators	Jun-15	Jul-15	Aug-15	Sep-15	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16
MTN	14,785,328	14,941,672	15,100,381	15,382,628	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
Vodafone	7,278,321	7,318,209	7,329,434	7,373,302	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
Tigo	4,463,678	4,482,765	4,426,375	4,453,250	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
Airtel	4,100,247	4,164,549	4,268,250	4,372,056	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
Glo	1,444,275	1,412,384	1,395,572	1,382,535	1,388,315	1,323,623	1,368,215	1,251,079	1,102,163	1,047,455	961,172	943,123	896,019
Expresso	127,665	127,091	126,265	127,528	121,152	122,114	120,282	116,193	110,383	105,968	103,848	101,771	99,736
Total	**32,199,514**	**32,446,670**	**32,646,277**	**33,091,299**	**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**

Appendix 3: Monthly post-paid mobile subscription

Mobile Operators	Jun-15	Jul-15	Aug-15	Sep-15	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16
MTN	100,963	104,745	111,422	110,424	113,494	119,848	148,026	149,710	152,744	156,830	165,117	166,203	167,627
Vodafone	18,073	18,996	23,721	23,720	23,721	19,923	18,205	18,205	18,205	16,045	138,162	138,482	142,914
Tigo	26,400	26,589	26,613	26,648	26,586	26,371	26,350	25,919	25,825	24,775	25,549	26,209	26,406
Airtel	11,519	11,566	11,585	11,618	11,683	11,716	11,750	11,780	11,856	11,905	11,975	12,009	12,034
Glo	1,452	1,440	1,386	1,277	1,230	1,210	1,187	1,196	1,138	1,180	1,166	1,137	1,063
Expresso	5,190	5,143	5,400	5,454	5,394	5,103	4,981	4,921	4,675	4,581	4,444	4,310	4,224
Total	**163,597**	**168,479**	**180,127**	**179,141**	**182,108**	**184,171**	**210,499**	**211,731**	**214,443**	**215,316**	**346,413**	**348,350**	**354,268**

Appendix 4: Mobile voice on-net tariff per operator (GHp)

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

Appendix 5: Mobile voice off-net tariff per operator (GHp)

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

Appendix 6: SMS on-net tariff per operator (GHp)

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

Appendix 7: SMS off-net tariff per operator (GHp)

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

Appendix 8: Data tariff per Megabyte per operator (GHp)

Mobile Operators	Q2 2015	Q3 2015	Q4 2015	Q1 2016	Q2 2016
MTN	10	10	10	10	10
Vodafone	10	11	11	12	13
Tigo	10	11	14	14	14
Airtel	14	14	14	14	14
Glo	10	10	10	11	12
Expresso	5	5	5	5	5
Industry average	**10**	**10**	**11**	**11**	**11**

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

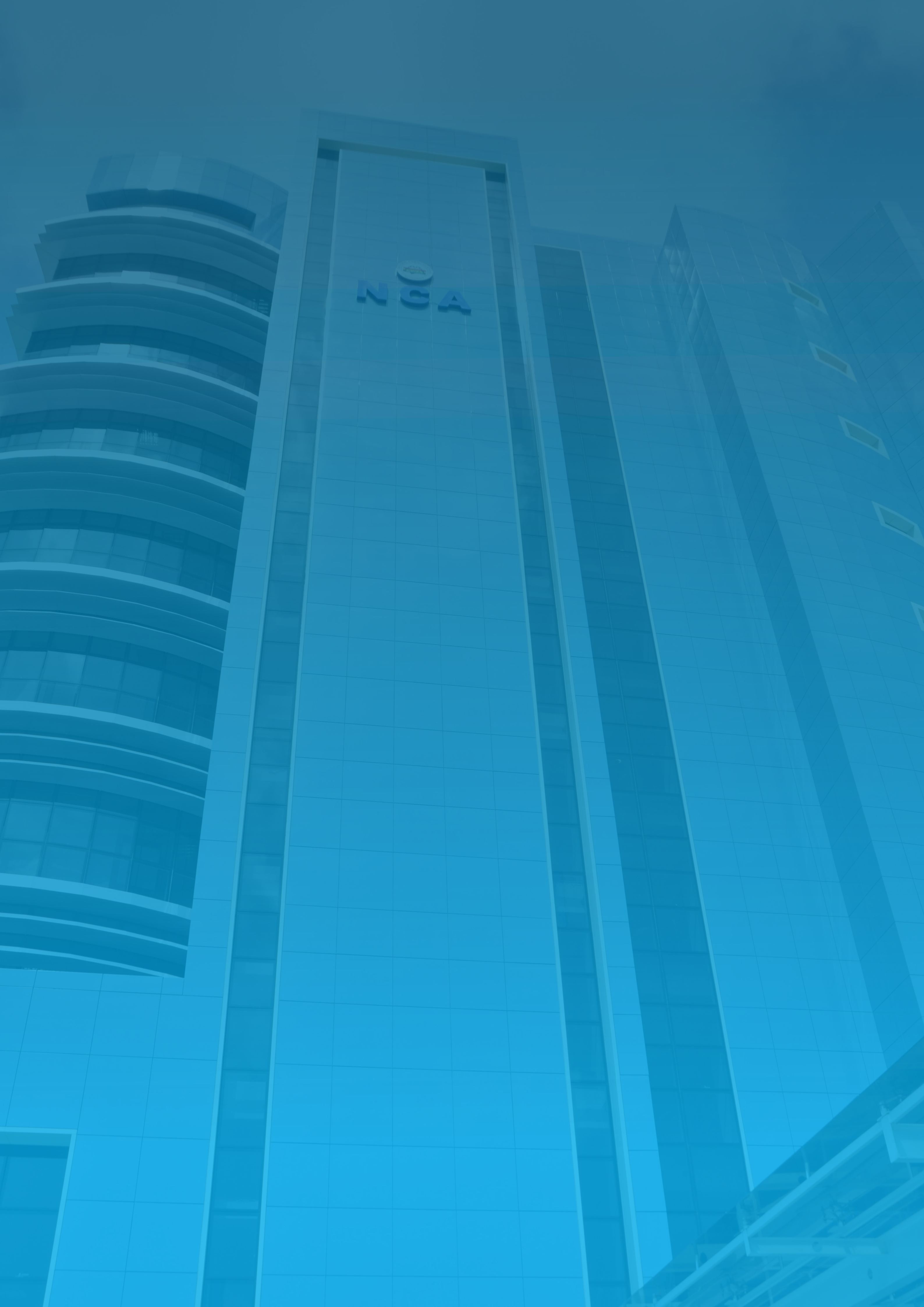
National Communications Authority,
Plot No 83/D Peakwase
P. O. Box SY125, Sunyani, Brong Ahafo Region
Tel: +233 (0) 3520 27564
E-Mail: complaints.sunyani@nca.org.gh

- ### 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