QUARTERLY STATISTICAL BULLETIN ON COMMUNICATIONS IN GHANA

Volume 6 Issue 2

NATIONAL COMMUNICATIONS AUTHORITY

SECOND QUARTER

APRIL - JUNE, 2021

Communications for Development

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

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LIST OF ABBREVIATIONS

BWA	Broadband Wireless Access
LTE	Long-Term Evolution
FM	Frequency Modulation
GH₵	Ghana Cedi
GHp	Ghana pesewas
MB	Megabytes
MNO	Mobile Network Operator
MoU	Minutes of Use
NCA	National Communications Authority
SMS	Short Message Service
TV	Television

VISION AND MISSION

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 that entails segregated data, industry trends and analysis of the Ghana's communications sector. The purpose of this document is to promote open and enriched public discussions on policies for telecom analysts, consumers, academia, policy makers, investors and other stakeholders for decision-making.

This bulletin is prepared from the monthly and quarterly data received from various licensees[1]. It also includes data on internet service providers and broadcasting entities and services providers that was gathered in-house.

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".

[1] MTN, Vodafone, AirtelTigo, Glo, Surfline, BBH, Telesol and BLU

DEFINITION OF TERMS

Average SMS per subscriptions - This is calculated by dividing the total average volume of SMS for the quarter by the total average mobile subscriptions for that quarter.

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

Cellular network or mobile network – refers to a communication network where the last mile connection 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 Subscriptions - It is calculated by dividing the total average volume of traffic for that quarter with the total average subscriptions for that quarter.

Mobile Data-refers to active mobile data subscriptions to GPRS, EDGE, HSPA, UMTS, EV-DO, 3G, and LTE that have generated internet traffic (uploaded and/ or downloaded data) within the last ninety (90) days.

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

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

Net Subscriptions 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[2]

A1. Service Providers Authorised/Licensed to Operate

Operator/Service Providers	Number of Authorisation/Licences	Number in Operation
Mobile Network Operators	4	4
Fixed Network Operators	3	3
Broadband Wireless Access	5	5
Television Stations	136	108
FM Stations	659	488

B1. Total Subscriptions

SUBSCRIPTION	QUARTER-ON-QUARTER			YEAR-ON-YEAR			Units
	Q1 2021	Q2 2021	*Growth (%)*	Q2 2020	Q2 2021	*Growth (%)*	
Mobile Voice Subscription	41.42	41.72	*0.72%*	40.48	41.72	*3.06%*	Million
Fixed Voice Subscription	310.00	315.17	*1.67%*	299.71	315.17	*5.16%*	Thousand
Mobile Data Subscription	22.94	22.85	*-0.39%*	25.20	22.85	*-9.33%*	Million
Fixed Data Subscription	78.07	90.05	*15.35%*	75.13	90.05	*19.86%*	Thousand
Broadband Wireless Access	53.10	53.26	*0.30%*	46.56	53.26	*14.39%*	Thousand

B2. Voice, Data and SMS Traffic

TRAFFIC	QUARTER-ON-QUARTER			YEAR-ON-YEAR			Units
	Q1 2021	Q2 2021	*Growth (%)*	Q2 2020	Q2 2021	*Growth (%)*	
Mobile Voice Traffic (Domestic)	27.28	26.74	*-1.98%*	24.54	26.74	*8.96%*	Billion minutes
Fixed Voice Traffic	9.32	9.36	*0.43%*	8.09	9.36	*15.70%*	Million minutes
Incoming International Traffic (Direct to Network Only)	64.83	60.27	*-7.03%*	59.06	60.27	*2.05%*	Million minutes
Outgoing International Traffic	120.51	119.52	*-0.82%*	117.35	119.52	*1.85%*	Million minutes
Mobile Data Traffic (MB)	205.38	229.08	*11.54%*	197.62	229.08	*15.92%*	Billion MB
BWA Data Traffic (MB)	6.85	6.97	*1.75%*	5.03	6.97	*38.57%*	Billion MB
SMS Count	487.67	550.1	*12.79%*	501.9	550.1	*9.60%*	Million

[2] The decimals may not be exact due to the rounding-off of the actual figures.

B3. Penetration Rate (%)

PENETRATION RATE (%)	QUARTER-ON-QUARTER			YEAR-ON-YEAR		
	Q1 2021	Q2 2021	*Growth (%)*	Q2 2020	Q2 2021	*Growth (%)*
Mobile Voice Subscription	133.14	133.29	*0.11%*	132.47	133.29	*0.62%*
Fixed Voice Subscription	1.00	1.01	*1.00%*	0.98	1.01	*3.06%*
Mobile Data Subscription	73.74	73.02	*-0.98%*	82.49	73.02	*-11.48%*
Fixed Data Subscription	0.25	0.29	*16.00%*	0.25	0.29	*16.00%*
Broadband Wireless Access	0.17	0.17	*0.00%*	0.15	0.17	*13.33%*

C1. Broadcasting Sector

FM/TV AUTHORISATION & OPERATIONS	QUARTER-ON-QUARTER			YEAR-ON-YEAR		
	Q1 2021	Q2 2021	*Growth (%)*	Q2 2020	Q2 2021	*Growth (%)*
FM Authorisation	629	659	*4.77%*	575	659	*14.61%*
FM Station Operating	465	496	*6.67%*	428	496	*15.89%*
TV Authorisations	136	136	*0.00%*	146	136	*-6.85%*
TV Stations Operating	110	108	*-1.82%*	102	108	*5.88%*

C2. Categories of Authorised FM Radio Stations

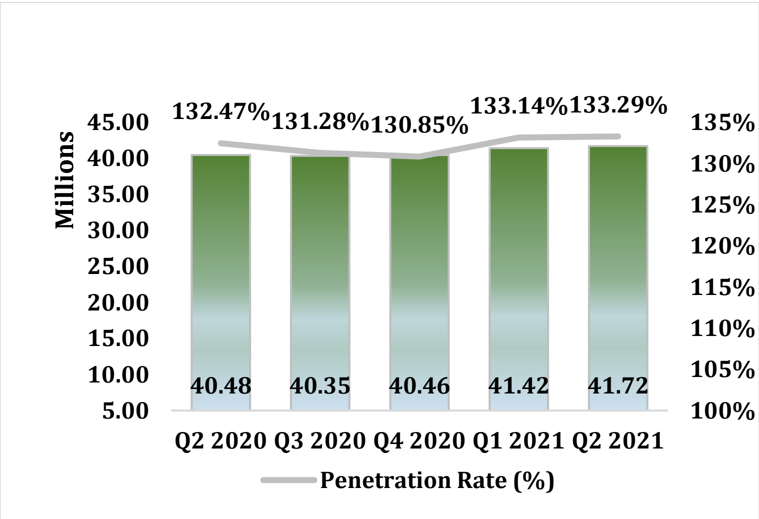
CATEGORIES OF FM RADIO STATIONS	QUARTER-ON-QUARTER			YEAR-ON-YEAR		
	Q1 2021	Q2 2021	*Growth (%)*	Q2 2020	Q2 2021	*Growth (%)*
PUBLIC	31	31	*0.00%*	33	31	*-6.06%*
PUBLIC FOREIGN	5	5	*0.00%*	5	5	*0.00%*
CAMPUS	23	24	*4.35%*	21	24	*14.29%*
COMMUNITY	96	103	*7.29%*	81	103	*27.16%*
COMMERCIAL	474	496	*4.64%*	437	496	*13.50%*

1.0 Mobile Network

This section provides details on the Mobile Network Operators (MNOs) in Ghana by looking at the mobile voice subscriptions, net additions to voice subscriptions, mobile penetration, volume of voice/data traffic, SMS and mobile data subscriptions. The National Communications Authority (NCA) licensed four service providers that provide mobile telecoms services in Ghana, namely AirtelTigo, Glo, MTN and Vodafone.

1.1 Mobile Voice Subscriptions and Penetration Rate[3]

***Figure 1: Mobile Voice Subscription and Penetration* Rate**



Mobile Voice subscriptions increased from 41.42 million at the end of Q1 2021 to 41.72 million at the end of Q2 2021, representing a growth of 0.72%.

Year-on-year subscriptions increased from 40.48 million at the end of Q2 2020 to 41.72 million at the end of Q2 2021, recording a growth of 3.06%.

The penetration rate as at the end of the second quarter of 2021 was 133.29% as compared to 133.14% recorded in the first quarter of 2021, indicating a growth of 0.11% (Figure 1) (Appendix, Table 1).

[3]The mobile penetration rate is estimated by dividing the total number of mobile subscribers by the total population. Population of Ghana was estimated based on the 2010 Population Census figure 24,658,823 published by Ghana Statistical Service (GSS) with 0.2% projected monthly growth rate. The High Penetration Rate is partly attributed to people owning more than one SIM card.

1.1.1 Voice Subscription Market Share per Operator

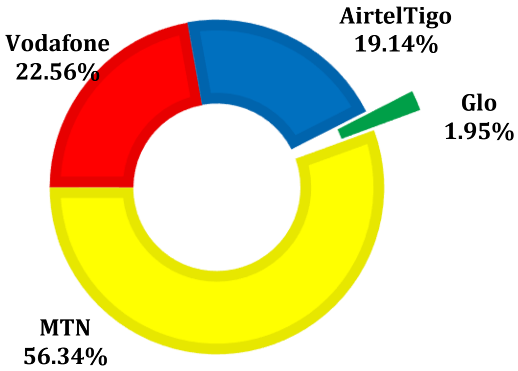
At the end of Q2 2021, MTN recorded 56.34% of the market with 23.50 million subscriptions.

Vodafone followed with 9.41 million subscriptions (22.56%).

AirtelTigo also recorded a market share of 19.14% and a subscriber base of 7.98 million.

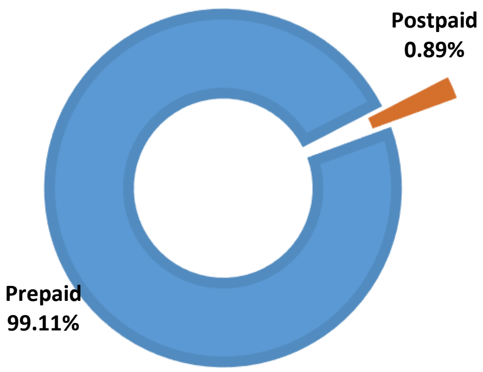
Glo followed with 0.81 million subscriptions with a market share of 1.95% (Figure 2) (Appendix, Table 2).

Figure 2: Market Share per Operator



1.1.2 Prepaid and Postpaid Mobile Voice Subscriptions

Figure 3: Prepaid and Postpaid Mobile Voice Subscriptions



Mobile voice subscription for prepaid subscribers is 41.34 million representing a market share of 99.11%, Post-paid stood at 0.89% with a subscription of 0.37 million (Figure 3) (Appendix, Table 3).

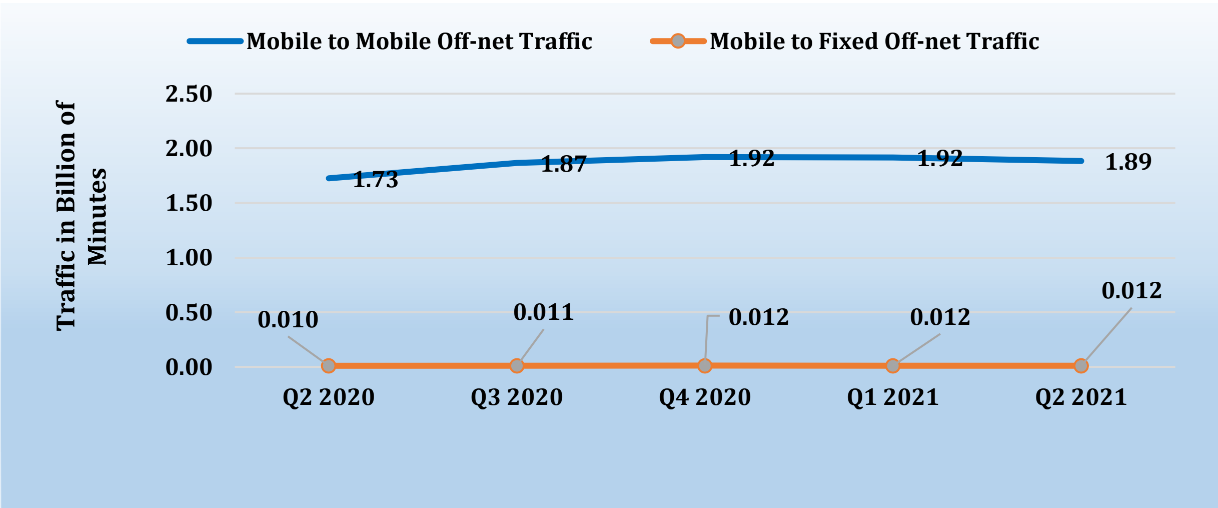
1.2 Off-net Mobile and Fixed Voice Traffic (Domestic)

Mobile-to-mobile off-net traffic declined from 1.92 billion minutes at the end of Q1 2021 to 1.89 billion minutes at the end of Q2 2021 representing a fall in growth by 1.56%.

Year-on-year mobile-to-mobile off-net traffic rose from 1.73 billion minutes at the end of Q2 2020 to 1.89 billion minutes at the end of Q2 2021, representing a growth of 9.25%.

Quarter-on-quarter mobile to fixed off-net traffic grew from 11.88 million minutes to 11.91 million minutes indicating a marginal growth of 0.25%. Year-on-year mobile-to-fixed off-net traffic grew at 14.52% from 10.40 million minutes at the end of Q2 2020 to 11.91 million minutes at the end of Q2 2021. (Figure 4) (Appendix, Table 4).

Figure 4: Off-net Traffic Distribution between Mobile and Fixed Networks



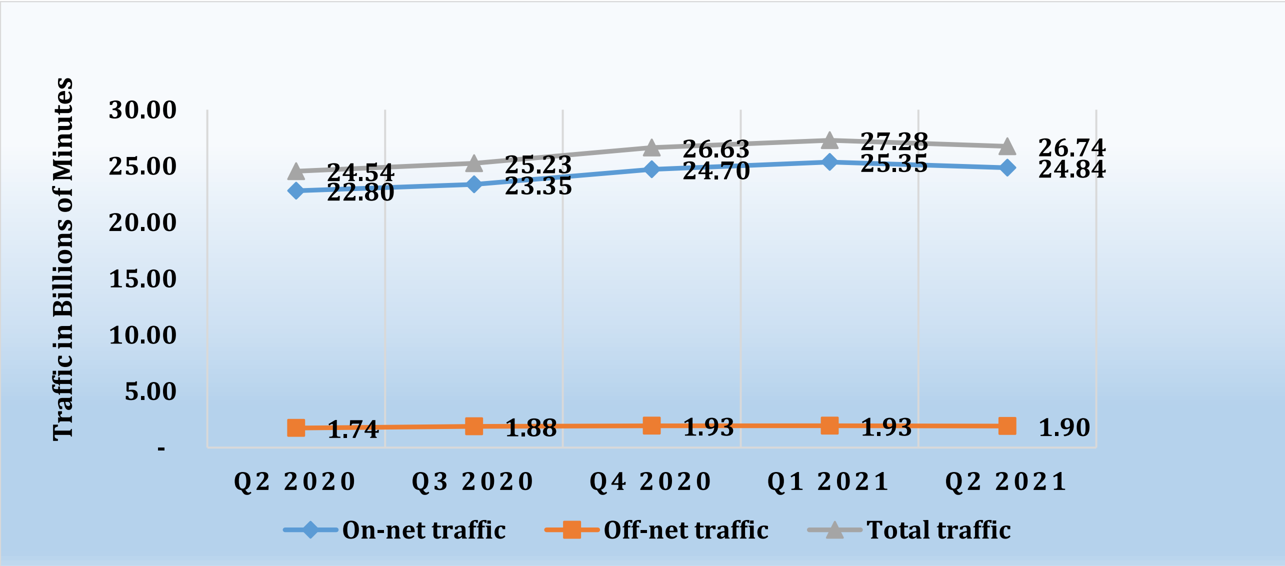
1.2.1 Total Domestic Mobile Voice Traffic

Total domestic mobile voice traffic recorded a decline from 27.28 billion minutes in Q1 2021 to 26.74 billion minutes in Q2 of 2021, representing a 2.01% decline in growth. Year-on-year mobile voice traffic also surged from 24.54 billion minutes at the end of the second quarter of 2020 to 26.74 billion minutes at the end of the second quarter of 2021, representing a growth rate of 8.96%

Off-net traffic decreased from 1.93 billion minutes at the end of Q1 2021 to 1.90 billion minutes at the end of Q2 2021, giving a decline in growth by 1.65%. Year-on-year off-net traffic moved from 1.74 billion minutes in Q2 2020 to 1.90 billion minutes at the end of Q2 2021 representing 9.28% growth.

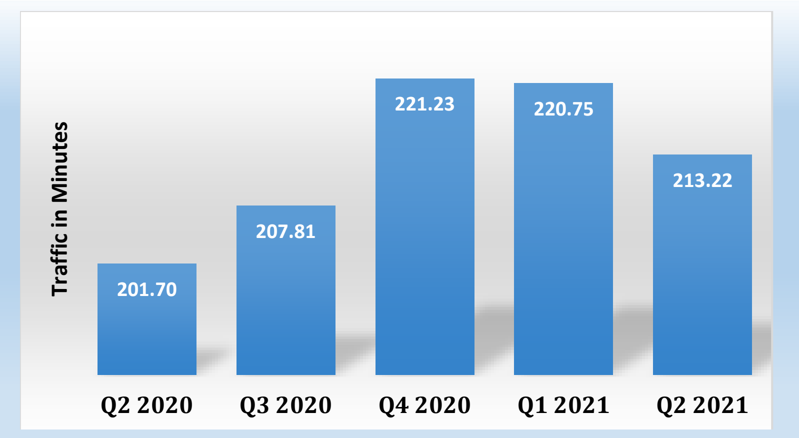
On-net traffic fell from 25.35 billion minutes in the previous quarter to 24.84 billion minutes at a negative growth of 2.04% during the quarter under review. Year-on-year on-net traffic also grew from 22.80 billion minutes in Q2 2020 to 24.84 billion minutes at the end of Q2 2021 representing 8.95% in growth rate. (Figure 5) (Appendix, Table 5).

Figure 5: Total Domestic Mobile Voice Traffic in Billions of Minutes



1.2.2 Minutes of Use (MoU)[4]

Figure 6: Mobile Voice Traffic Minutes of Use (MoU) per subscriptions



Quarter-on-quarter average minutes of use per subscription declined from 220.75 minutes in Q1 2021 to 213.22 minutes (-3.41%) in Q2 2021.

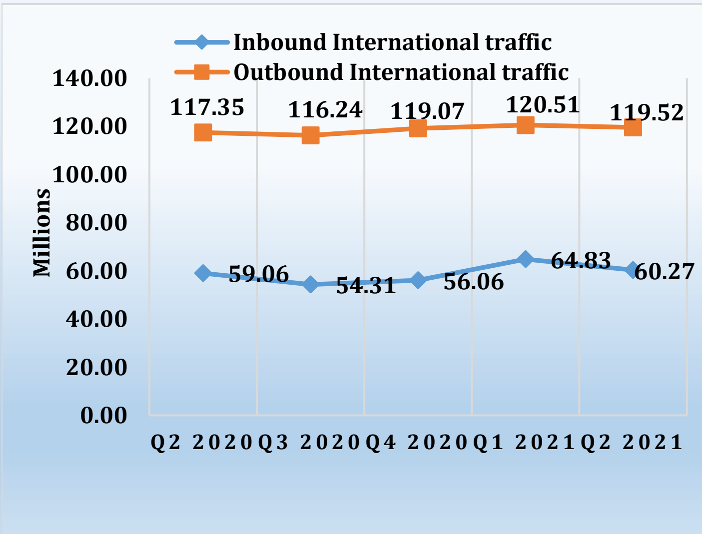
Year-on-year minutes of use per subscription grew from 201.70 minutes in Q2 2020 to 213.22 minutes in Q2 2021, representing 5.71 % growth (figure 6) (Appendix, Table 6).

1.3 International Traffic

During the quarter under review, inbound international traffic decrease from 64.83 million minutes to 60.27 million minutes, representing a decrease of 7.03%. Year-on-year inbound international traffic increased from 59.06 million minutes to 60.27 million minutes showing a decrease in growth by 2.05%.

Outbound international traffic showed 0.82% decline in growth from 120.51 million minutes in Q1 2021 to 119.52 million minutes at the end of Q2 2021. Year- on –year outbound international traffic grew from 117.35 million minutes to 119.52 million minutes, indicating an increase of 1.85% (Figure 7) (Appendix, Table 7).

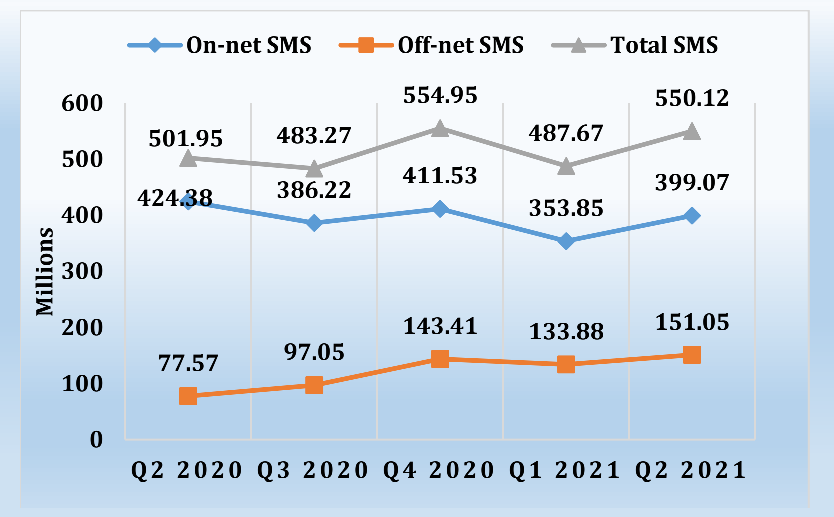
Figure 7: International Traffic in Minutes (Millions)



[4] Minutes of use per subscriptions is calculated by dividing the total average volume of traffic for the quarter by the total average subscriptions for that quarter.

1.4 Short Messages Service (SMS)

Figure 8: Total Number of SMS

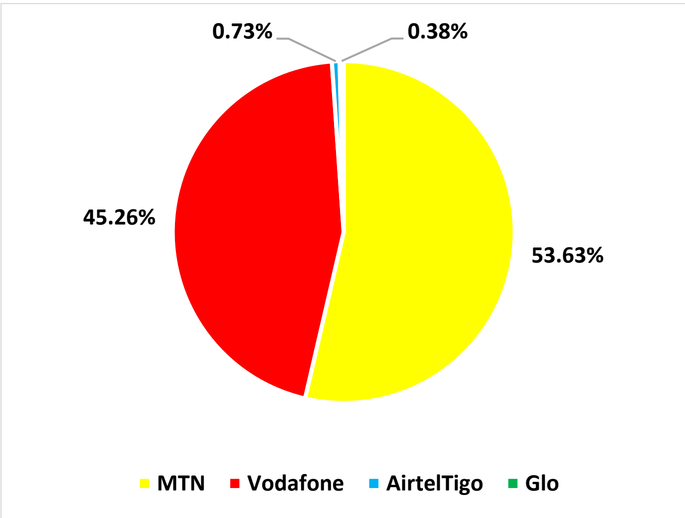


The total number of short messages service (SMS) sent at the end of Q2 2021 was 550.12 million as compared to 487.67 million in the preceding quarter, recording a 12.80% increase.

Year-on-year SMS counts went up from 501.95 million in Q2 2020 to 550.12 million at the end Q2 2021, representing an increase of 9.60% (figure 8) (Appendix, Table 8).

1.4.1 SMS Counts per Mobile Network Operator/Market Share

Figure 9: Average SMS per Mobile Network Operator



The volume of SMS traffic originating from MTN was 295.04 million at the end of Q2 2021; representing a market share of 53.63% of the total, SMS count.

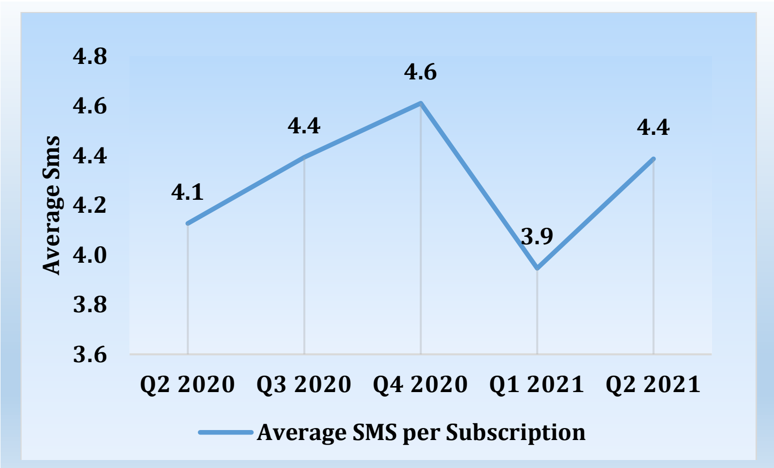
The volume of SMS traffic from Vodafone was 248.99 million, representing a market share of 45.26% of the total SMS count.

AirtelTigo had an SMS count of 4.00 million, representing 0.73% of the market share of the total SMS count.

Glo generated 2.09 million SMS count recording a share of 0.38% (Figure 9) (Appendix, Table 8).

1.4.2 Average SMS per subscription

Figure 10: Average SMS per Subscription



Quarter-on-quarter average SMS sent per subscription at the end of Q2 2021 recorded 4.4 SMS, indicating an increase of 11.18 % as compared to the end of Q1 2021, which was about 3.9.

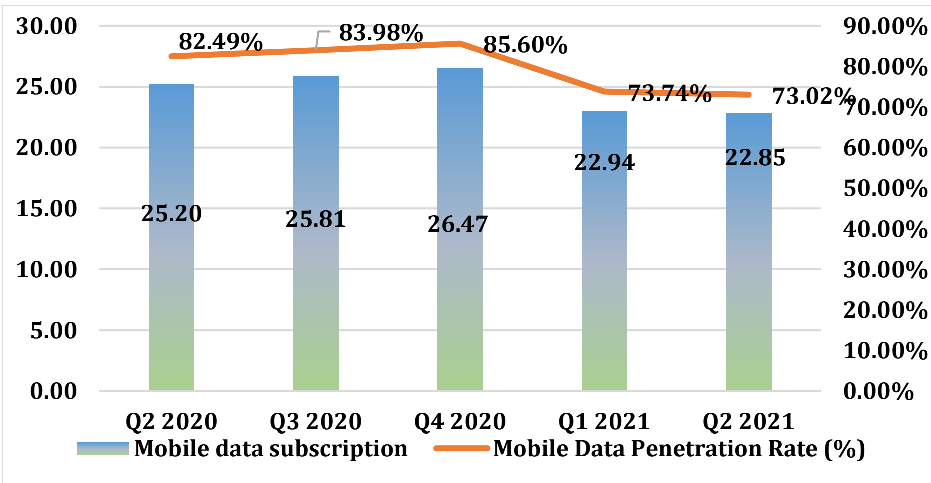
Year-on-year average SMS volume per subscription recorded an increase of 7.32% from approximately 4.1 at the end of Q2 2020 to 4.4 at the end of Q2 2021. (Figure 10) (Appendix, Table 9).

1.5 Mobile Data Subscriptions and Penetration Rate (%)

At the end of Q2 2021, mobile data subscriptions decreased by 0.39% from 22.94 million at the end of Q2 2021 to 22.85 million.

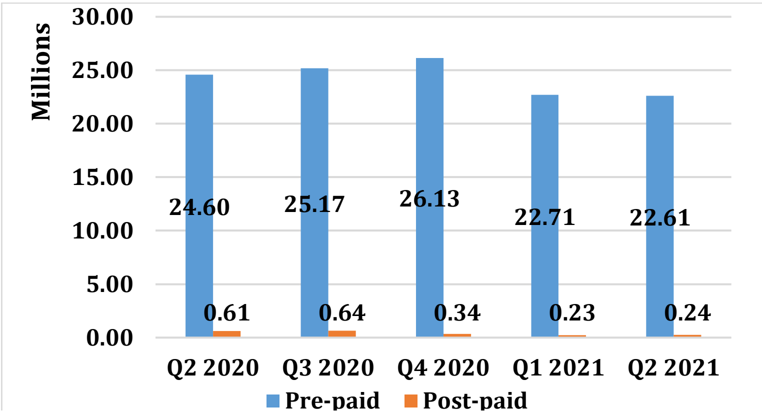
Year-on-year subscriptions decreased by 9.33%, from 25.20 million at the end of Q2 2020 to 22.85 million at the end of Q2 2021 (Figure 11) (Appendix, Table 10).

Figure 11: Mobile Data Subscriptions and Penetration Rate (%)



1.5.1 Mobile Data Pre-paid and Post-paid Subscriptions

Figure 12: Mobile Data Pre-paid and Post-paid Subscriptions

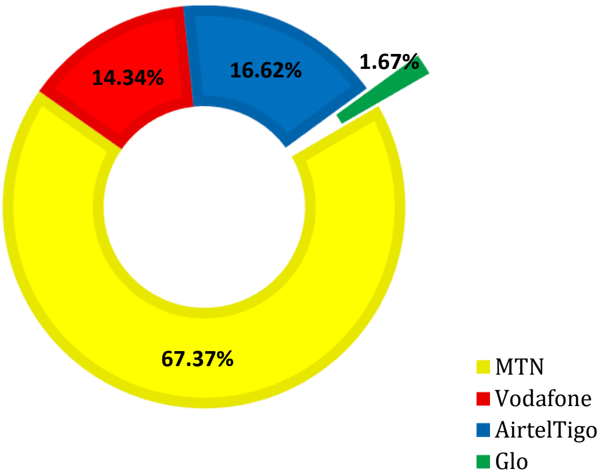


Mobile data pre-paid subscriptions decreased from 22.71 million in the first quarter of 2021 to 22.61 million subscriptions at the end of the second quarter of 2021, representing 98.93% of the total mobile data.

Mobile data post-paid subscriptions inversely increased from 0.23 million in the first quarter of 2021 to 0.24 million subscriptions representing 1.07% of the total mobile data at the end of Q2 2021 (Figure: 12) (Appendix, Table 10).

1.5.2 Mobile Data Subscriptions per Mobile Network Operator /Market Share

Figure 13: Market Share per Operator



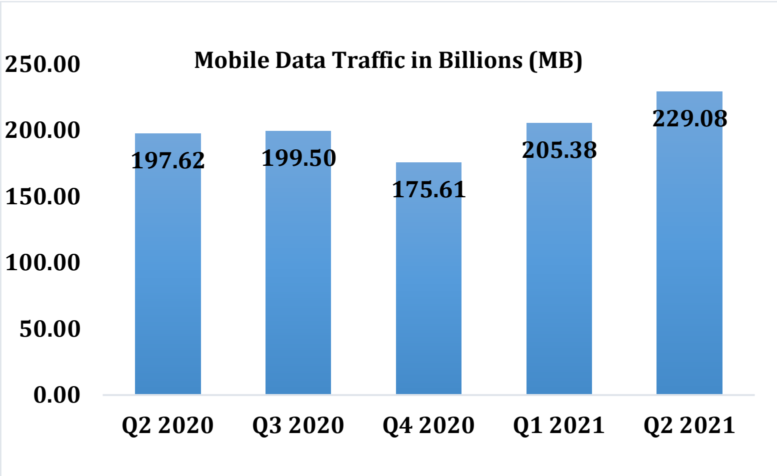
MTN recorded 15.40 million subscriptions with a market share of 67.37%.

While Vodafone recorded 3.28 million subscriptions with a market share of 14.34%, AirtelTigo had 3.80 million in mobile data subscriptions with a market share of 16.62%.

Glo ended the second quarter of 2021 with a total data subscription of 0.38 million and a market share of 1.66% (Figure 13).

1.6 Mobile Data Traffic in Billions of Megabytes (MB)

Figure 14: Mobile Data Traffic in Billions of Megabytes (MB)



At the end of Q2 2021, internet traffic generated by the mobile network operators was 229.08 billion megabytes of data, recording an increase in growth by 11.54 % as compared to 205.38 billion megabytes of data at the end of Q1 2021.

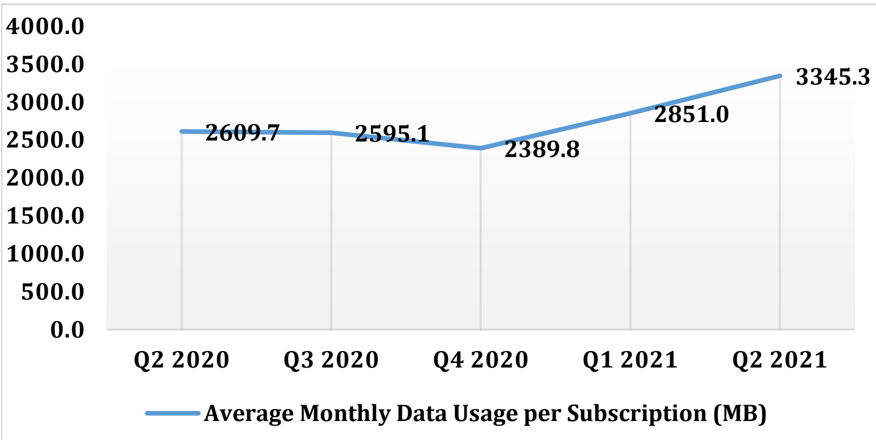
Year-on-year internet traffic increased from 197.62 billion megabytes at the end of Q2 2020 to 229.08 billion megabytes at the end of Q2 2021, representing an increase of 15.92% (Figure 14) (Appendix, Table 11).

1.6.1 Mobile Internet Usage per Subscription (MB) [5]

The average mobile internet usage per subscription increased from 2851.0 MB at the end of Q1 2021 to 3345.3 MB at the end of Q2 2021 recording a growth of 17.34%.

Year-on- year average data usage per subscription increased from 2609.7 MB at the end of Q2 2020 to 3345.3 MB at the end of Q2 2021, recording a growth of 28.19% (Figure 15) (Appendix, Table 12).

Figure 15: Mobile Data Usage per Subscription (MB)



[5] Mobile Internet usage per subscription is calculated by dividing the total average volume of internet traffic for the quarter by the total average mobile internet subscription for that quarter.

1.6.2 Mobile Internet Traffic (MB) per Mobile Network Operator

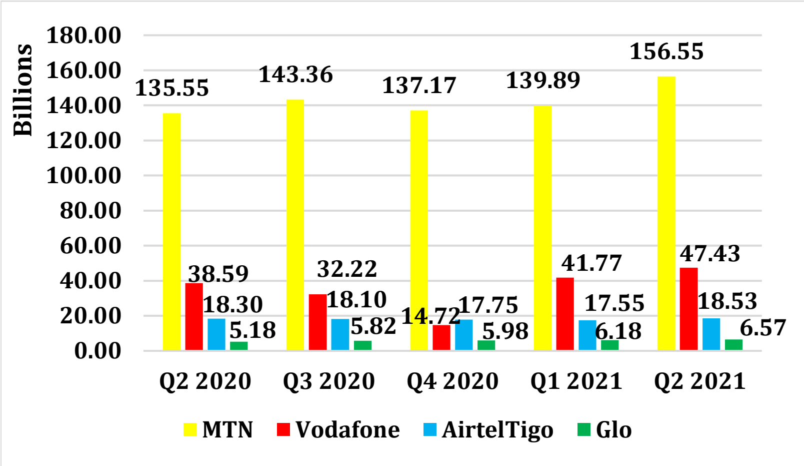
MTN generated the highest volume of internet traffic of 156.55 billion megabytes with a market share of 68.34%.

Vodafone followed with a traffic of 47.43 billion megabytes and a market share of 20.70%.

AirtelTigo also had 18.53 billion megabytes of data, recording a market share of 8.09%.

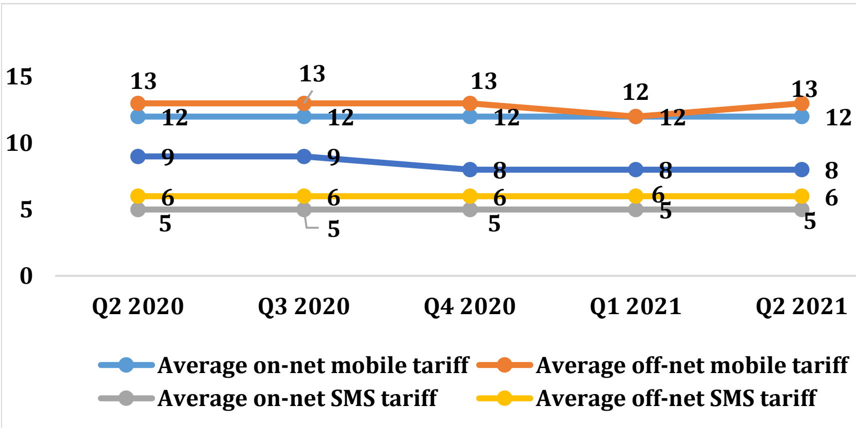
Glo recorded the least data usage, generating 6.57 billion megabytes with a market share of 2.87% (Figure 16) (Appendix, Table 13)

Figure 16: Mobile Internet Traffic (MB) per Operator



1.7 Mobile Telecommunications Service Tariffs

Figure 17: Average Mobile Tariffs per Service



Quarter- on -quarter average tariffs for off net mobile increased from 0.12 pesewas in Q1 2021 to 0.13 pesewas at the end of Q2 2021.

Average on net tariff mobile remained at 0.12 pesewas.

Average off net and on net SMS tariffs stood at 0.06 and 0.05 pesewas respectively.

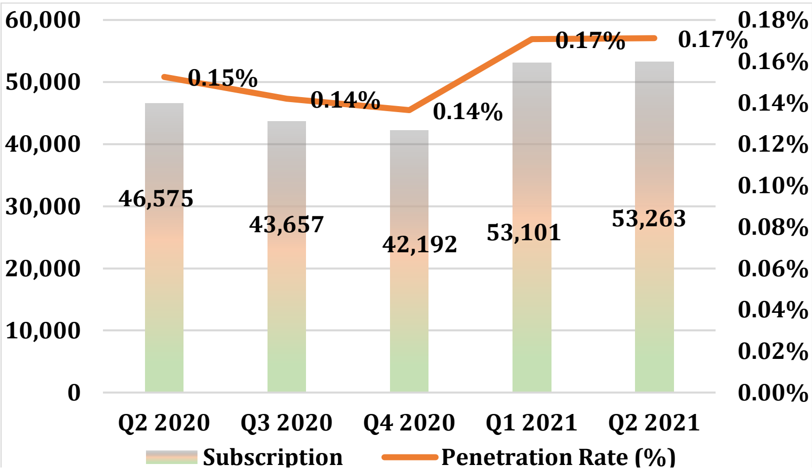
The average data tariff for the quarter also maintained its price of 0.08 pesewas. (Figure 17) (Appendix, Table 14).

2.0 BROADBAND WIRELESS ACCESS (BWA)

There are five (5) Broadband Wireless Access operators in Ghana namely; BLU Telecommunications, Broadband Home (BBH), Busy Internet[6], Surfline and Telesol.

2.1 BWA Subscriptions and Penetration Rate

Figure 18: BWA Subscription and Penetration Rate



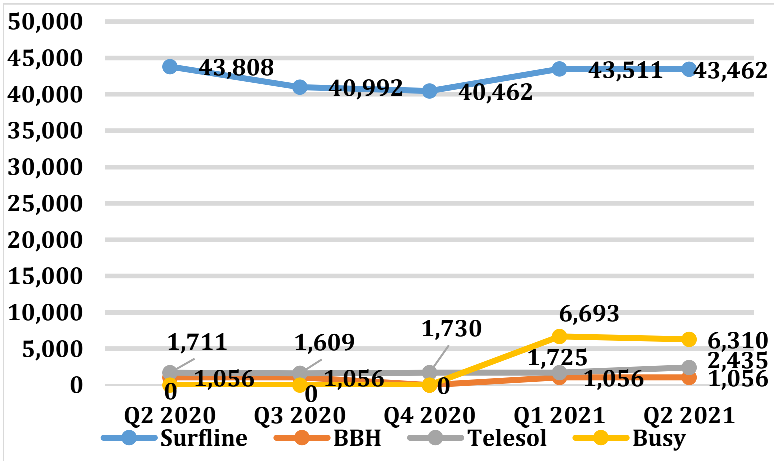
BWA subscriptions increased from 53,101 in the first quarter of 2021 to 53,263 in the second quarter of 2021, representing an increase in growth by 0.31%.

Year-on-year subscriptions also grew by 14.36%, which was from 46,575 in the second quarter of 2020 to 53,263 at the end of the second quarter of 2021.

Penetration rate for broadband wireless access also remained at 0.17% in the previous quarter and the quarter under review. (Figure 18) (Appendix, Table 15).

2.1.1 Subscriptions per Broadband Wireless Access (BWA) Operator

Figure 19: Subscriptions per Broadband Wireless Access (BWA) Operator



Surfline recorded 43,462 subscriptions at the end of the quarter under review representing 81.60% of the market share, as against 43,511 in the previous quarter.

Busy ended this quarter with a subscription of 6,310 and a market share of 11.85%.

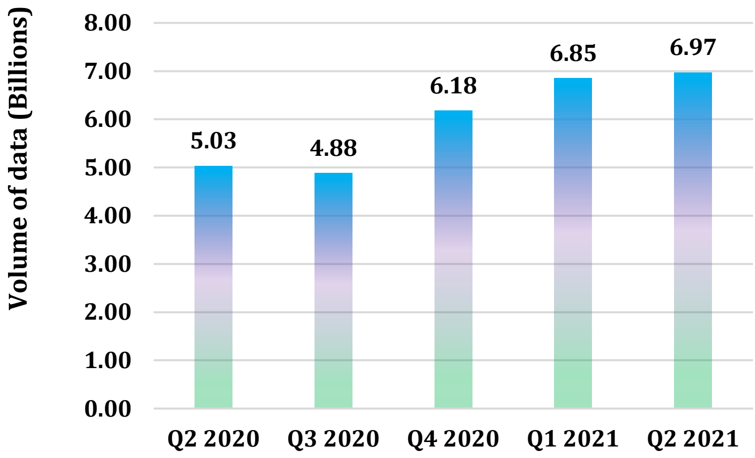
Telesol recorded 2,435 subscriptions this quarter with a market share of 4.57%

BBH had a subscription of 1,056 and a market share of 1.98% at the end of the second quarter of 2021. (Figure 19) (Appendix, Table 16).

[6] As at the time of preparation of the report, there was no available data for BLU.

2.2 Broadband Wireless Access (BWA) Volume of Internet Traffic

Figure 20: BWA Internet Traffic in Megabyte (MB)



The total volume of internet traffic generated by the BWAs rose from 6.85 billion megabytes at the end of Q1 2021 to 6.97 billion megabytes at the end of Q2 2021, indicating a growth of 1.72%.

Year-on-year internet traffic generated by the BWAs increased from 5.03 billion megabytes at the end of Q2 2020 to 6.97 billion megabytes at the end of Q2 2021, representing a growth of 38.48% (Figure 20) (Appendix A, Table 17).

2.2.1 Volume of BWA Traffic per Operator

Surfline's total volume of internet traffic for the quarter under review was 5.18 billion MB, as against 4.88 billion MB in the previous quarter representing 74.33 % of the total volume of traffic.

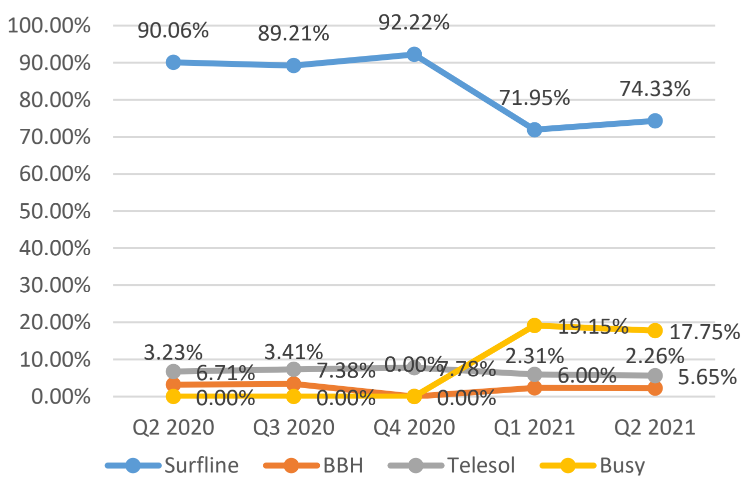
Busy had a total internet traffic of 1.24 billion MB at the end of the second quarter of 2021 with a market share of 17.75%.

Telesol recorded 0.394 billion MB with a market share of 5.65%

BBH ended Q2 2021 with 0.158 billion MB of volume of internet traffic and a market share of 2.28%

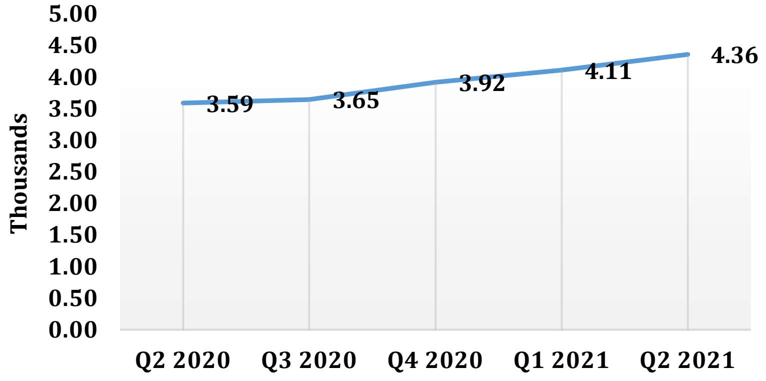
(Figure 21) (Appendix, Table 17).

Figure 21: BWA Traffic Market Share per Operator (MB)



2.2.2 Average Monthly Internet Usage per BWA Subscription[7]

Figure 22: Average Internet Usage per BWA Subscription



Average internet usage per BWA subscription increased to 4.36 thousand megabytes in the second quarter of 2021 from 4.11 thousand megabytes in the previous quarter.

Year-on-year internet usage per subscription also increased from 3.59 megabytes in the second quarter of 2020 to 4.36 megabytes at the end of the second quarter of 2021 (Figure 22) (Appendix, Table 18).

[7] BWA data per subscriptions is calculated by dividing the total average volume of BWA's traffic for the quarter by the total average of BWA subscriptions for that quarter.

3.0 FIXED NETWORK

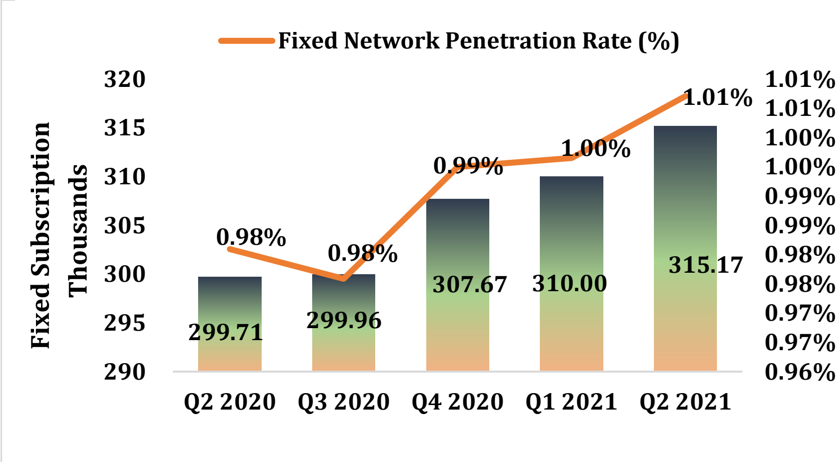
This section analyses the fixed telephone industry in Ghana. Three (3) operators namely Vodafone, AirtelTigo and MTN have been licensed by the NCA to provide this service.

3.1Fixed Voice Subscriptions and Penetration Rate

Total number of fixed line subscriptions increased from 310,001 in the first quarter of 2021 to 315,167 at the end of the second quarter of 2021. This shows a penetration rate of 1.01% and a 1.67% growth in subscriptions.

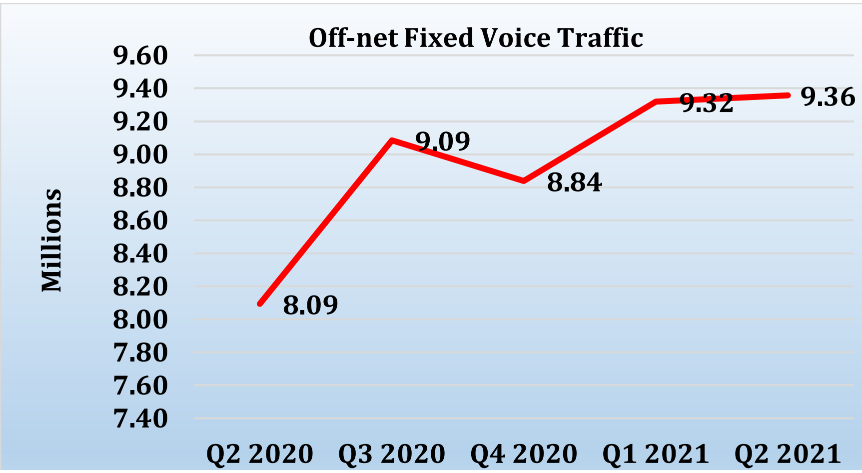
Year-on-year subscription increased from 299,714 in Q2 2020 to 315,167 at the end of Q2 2021, representing a growth rate of 5.16% (Figure 23) (Appendix, Table 19).

Figure 23: Fixed Network Voice Subscription and Penetration Rate



3.2 Fixed Voice Network Traffic

Figure 24: Total Fixed Voice Traffic



Total fixed voice traffic increased by 0.41% in Q2 2021, from 9.32 million minutes in Q1 2021 to 9.36 million minutes.

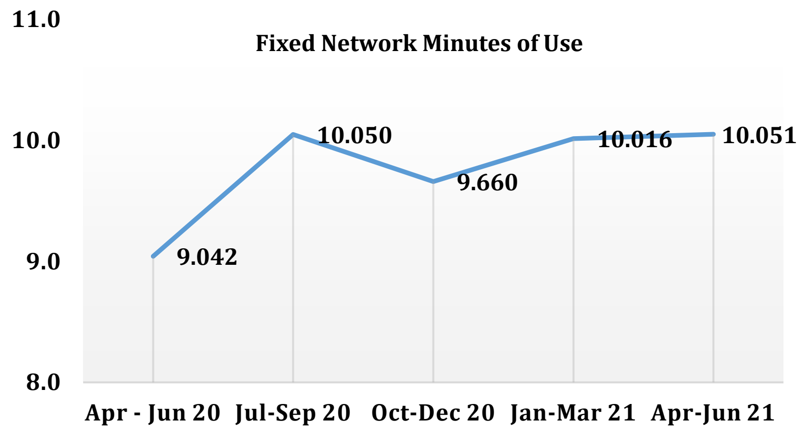
Year-on-year total fixed voice traffic increased exponentially by 15.62%, from 8.09 million minutes in Q2 2020 to 9.36 million minutes in Q2 2021. (Figure 24) (Appendix, Table 20).

3.3 Fixed Voice Average Minute of Use[8]

Average fixed voice traffic per subscription increased from 10.016 to 10.051 minutes at the end of the second quarter of 2021 (0.35%).

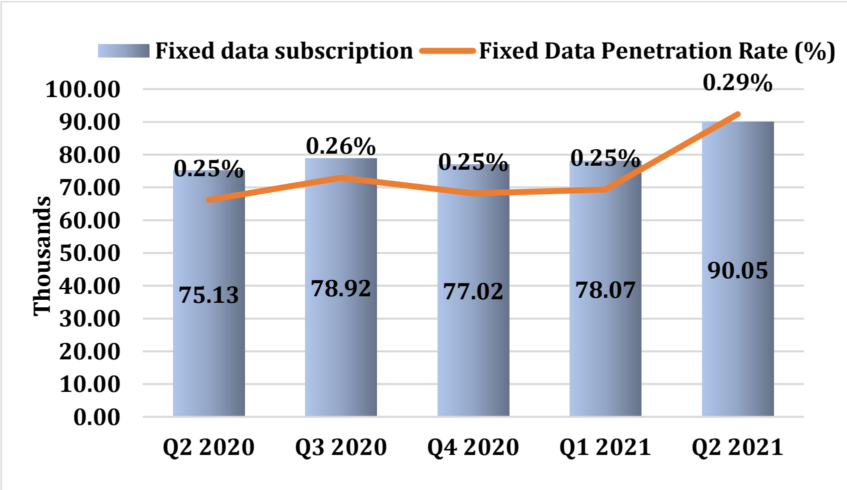
Year-on-year minutes of use per subscription increased from 9.042 minutes in the second quarter of 2020 to 10.051 minutes at the end of the second quarter of 2021 (11.16%) (Figure 25) (Appendix A, Table 21).

Figure 25: Fixed Network Minute of Use



3.4 Fixed Data Subscriptions and Penetration

Figure 26: Fixed Data Subscriptions and Penetration



Fixed Data subscriptions went up from 78,068 in the previous quarter to 90,052 in the quarter under review, which represents a growth rate of 15.35%.

At a growth rate of 19.86%, Year-on-year fixed data subscriptions increased from 75,132 in the preceding year to 90,052 at the end of the second quarter of 2021.

Fixed data penetration rate increased from 0.25% at the end of the first quarter of 2021 to 0.29% at the end of the second quarter of 2021. (Figure 26) (Appendix, Table 22).

[8] Fixed Network Minutes of use per subscriptions is calculated by dividing the total average volume of traffic for the quarter by the total average fixed subscriptions for that quarter.

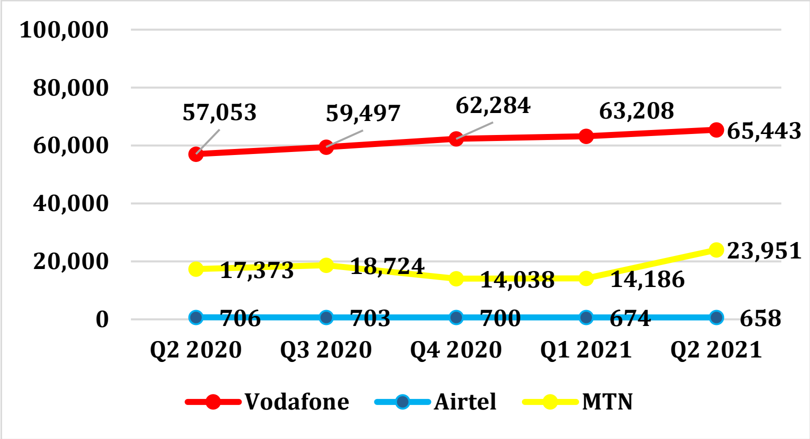
3.5 Fixed Data Subscriptions per Mobile Network Operator

Vodafone's subscriptions at the end of Q2 2021 was 65,443 representing 72.67% of the market share as against 63,208 in Q1 2021.

MTN's subscriptions at the end of Q2 2021 was 23,951 representing 26.60% of the market share.

AirtelTigo recorded 658 subscriptions at the end of Q2 2021 with a market share of 0.73%. (Figure 27) (Appendix, Table 23).

Figure 27: Fixed Data Subscription per Operator



4.0 BROADCASTING

4.1 Authorised Frequency Modulation (FM) Radio Station

Authorisation was given to 30 new FM stations to begin operations bringing the total number of authorised FM stations in Ghana from 629 in Q1 2021 to 659 at the end of Q2 2021. The total number of FM stations in operation was 488 in the quarter under review.

The Ashanti Region had the highest number of FM stations (95), representing 15.10% of the total number of authorised FM stations in the country. The Savannah Region had the least number of authorised FM Stations (11), representing 1.75% of the total authorised FM Stations in the country. (Figure 28) (Appendix A, Table 25).

Figure 28: Regional distribution of authorised FM stations as at end of Q2 2021

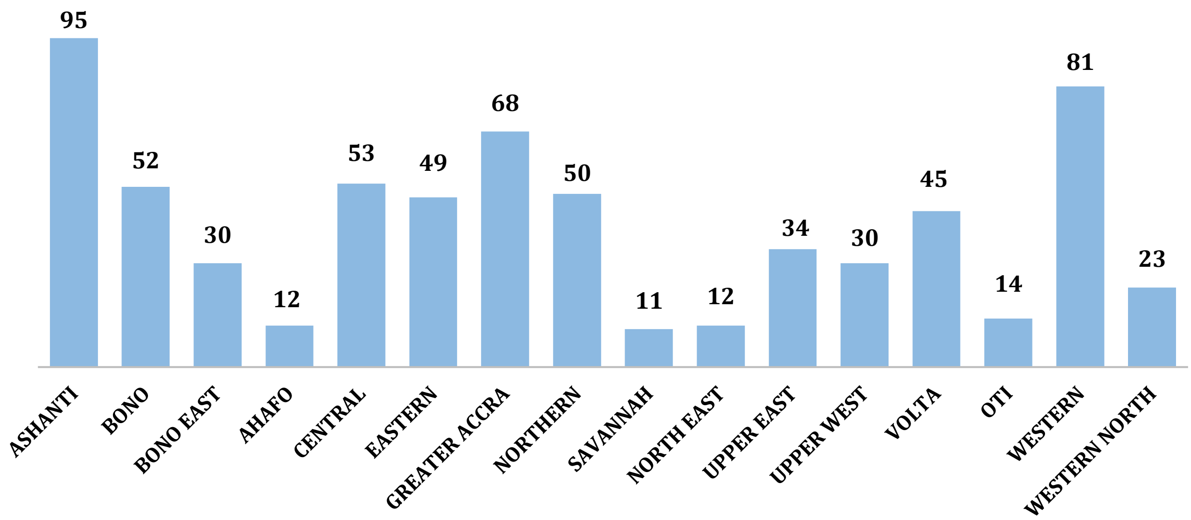


Figure 29: Regional distribution of On-air and Off-air FM stations as at end of Q2 2021

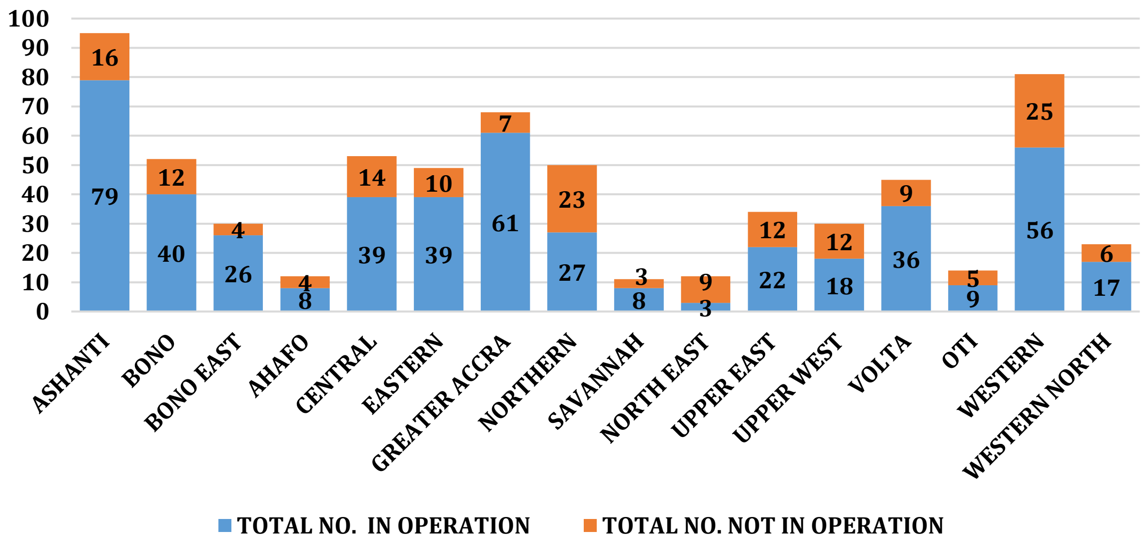
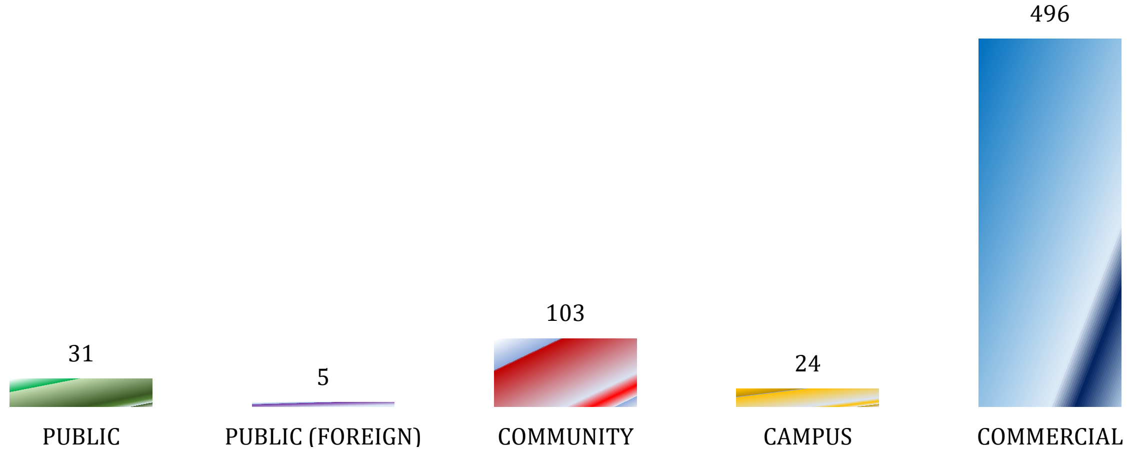


Figure 30: Purpose of Authorised Radio Stations as at Q2 2021



4.2 Authorised Television Stations

The total number of authorised TV stations in Ghana at the end of the second quarter of 2021 was 136 out of which 108 were operational during the quarter under review, representing 79.41% of the total number of authorised TV stations in the country (Figure 32) (Appendix A, Table 26).

Figure 31: Authorised TV Stations Q2 2021

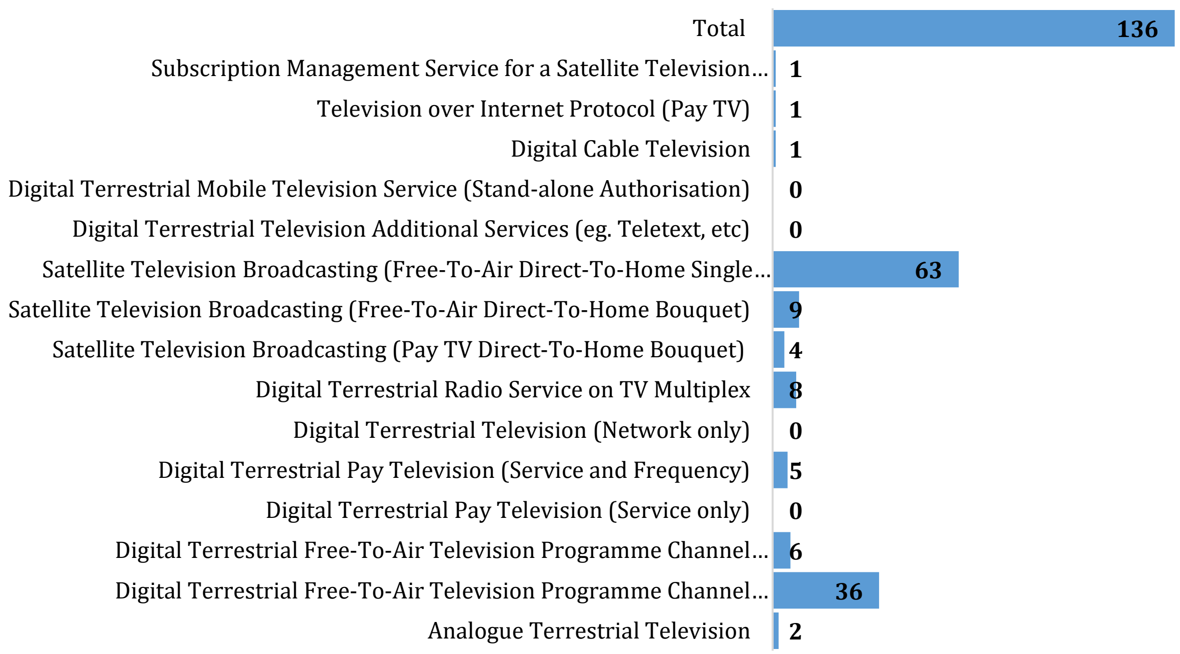
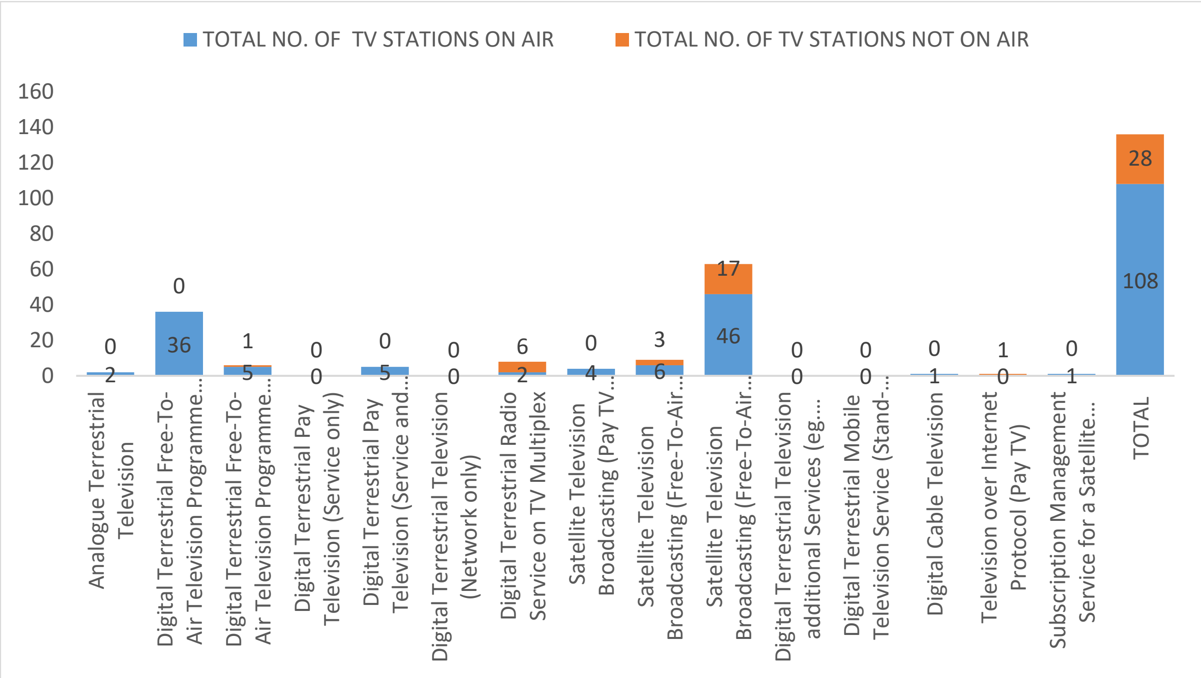


Figure 32: Distribution of Types of TV Services (On-Air and Off-Air TV Stations) as at end of Q2 2021



Appendix A (List of Tables)

Table 1: Mobile Voice Subscriptions and Penetration Rate

Subscription	Q2 2020	Q3 2020	Q4 2020	Q1 2021	Q2 2021
Mobile Subscription	40,476,556	40,352,913	40,461,609	41,418,710	41,715,259
Mobile Subscription Growth rate (%)	-3.53%	-0.31%	0.27%	2.37%	0.72%
Net additions	-1,482,742	-123,643.00	108,696.00	957,101.00	296,549.00
Net additions Growth Rate (%)	-235%	-92%	-188%	781%	-69%
Population[9]	30,554,178	30,737,870	30,922,666	31,108,574	31,295,599
Penetration Rate (%)	**132.47%**	**131.28%**	**130.85%**	**133.14%**	**133.29%**

Table 2: Mobile Voice Subscriptions and Market Share per Operator

Mobile Network Operator		Q2 2020	Q3 2020	Q4 2020	Q1 2021	Q2 2021
MTN	Subscriptions	23,277,698	23,722,910	23,144,302	23,392,300	23,504,397
	Market Share (%)	57.51%	58.79%	57.20%	56.48%	56.34%
Vodafone	Subscriptions	8,585,484	8,118,298	8,400,565	8,917,137	9,412,253
	Market Share (%)	21.21%	20.12%	20.76%	21.53%	22.56%
AirtelTigo	Subscriptions	7,866,500	7,749,026	8,135,618	8,324,512	7,984,134
	Market Share (%)	19.43%	19.20%	20.11%	20.10%	19.14%
Glo	Subscriptions	746,874	762,679	781,124	784,761	814,475
	Market Share (%)	1.85%	1.89%	1.93%	1.89%	1.95%
Total Industry Subscription		**40,476,556**	**40,352,913**	**40,461,609**	**41,418,710**	**41,715,259**

[9] Population of Ghana was estimated based on the 2010 Population Census figure 24,658,823 published by Ghana Statistical Service (GSS) with 0.2% projected monthly growth rate.

Table 3: Prepaid and Post-paid Voice Subscriptions and Market Share

Subscription	Q2 2020	Q3 2020	Q4 2020	Q1 2021	Q2 2021
Prepaid	39,747,560	39,589,962	40,173,414	41,134,101	41,342,136
Market Share	98.20%	98.11%	99.29%	99.31%	99.11%
Post-paid	728,996	762,951	288,195	284,609	373123
Market Share	1.80%	1.89%	0.71%	0.69%	0.89%
Total mobile subscription	**40,476,556**	**40,352,913**	**40,461,609**	**41,418,710**	**41,715,259**

Table 4: Mobile Off-net Traffic Distribution between Mobile and Fixed Network

Breakdown of Off-net Traffic	Q2 2020	Q3 2020	Q4 2020	Q1 2021	Q2 2021
Traffic (Mobile to Mobile)	1,725,360,859	1,866,455,132	1,919,526,571	1,916,850,431	1,885,009,496
Share (%)	99.40%	99.42%	99.37	99.38%	99.37%
Growth (%)	0.67%	8.18%	2.84%	-0.14%	-1.66%
Traffic (Mobile to Fixed)	10,414,394	10,961,513	12,239,493	11,879,043	11,913,424
Share (%)	0.60%	0.58%	0.63%	0.62%	0.63%
Growth (%)	-7.09%	5.25%	11.66%	-2.94%	0.29%
Total Off-net Traffic	**1,735,775,253**	**1,877,416,645**	**1,931,766,009**	**1,928,729,474**	**1,896,922,920**

Table 5: Total Domestic Mobile Voice Traffic in Billions of Minutes

Traffic	Q2 2020	Q3 2020	Q4 2020	Q1 2021	Q2 2021
Traffic (Off-net)	1,735,775,253	1,877,416,645	1,931,766,009	1,928,729,474	1,896,922,920
Share (%)	7.07%	7.44%	7.25%	7.07%	7.10%
Growth (%)	0.62%	8.16%	2.89%	-0.16%	-1.65%
Traffic (On-net)	22,800,072,201	23,354,795,602	24,696,111,020	25,354,235,060	24,838,177,542
Share (%)	92.93%	92.56%	92.75%	92.93%	92.90%
Growth (%)	7.33%	2.43%	5.74%	2.66%	-2.04%
Total traffic	**24,535,847,454**	**25,232,212,246**	**26,627,877,029**	**27,282,964,534**	**26,735,100,463**

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

Traffic	Q2 2020	Q3 2020	Q4 2020	Q1 2021	Q2 2021
Total mobile voice traffic (Average)	8,178,615,818	8,410,737,415	8,875,959,010	9,034,992,058	8,911,700,154
Mobile voice subscription (Average)	40,547,599	40,473,681	40,120,522	41,198,050	41,795,710
Minutes of Use (MoU) per Subscription	201.70	207.81	221.23	219.31	213.22
MoU growth rate (%)	9.89%	3.03%	6.46%	-0.87%	-3.41%

Table 7: International Traffic

Traffic	Q2 2020	Q3 2020	Q4 2020	Q1 2021	Q2 2021
Incoming International Traffic	59,056,445	54,307,726	56,058,034	64,828,793	60,270,936
Growth (%)	14.73%	-8.04%	3.22%	15.65%	-7.03%
Outgoing International Traffic	117,349,645	116,240,940	119,070,166	120,507,233	119,521,985
Growth (%)	-4.43%	-0.94%	2.43%	1.21%	-0.82%

Table 8: Total Number of SMS per Mobile Network Operator in Millions

Mobile Operators	Q2 2020	Q3 2020	Q4 2020	Q1 2021	Q2 2021
Off-net					
MTN	25,239,001	30,951,874	40,197,534	49,379,750	55,278,726
Vodafone	49,753,675	63,289,966	100,306,049	81,174,285	92,190,382
AirtelTigo	1,676,701	1,718,367	1,553,674	1,664,913	1,761,762
Glo	898,516	1,084,803	1,357,237	1,599,201	1,814,990
Total	**77,567,893**	**97,045,010**	**143,414,494**	**133,818,149**	**151,045,860**
On- net					
MTN	287,142,138	247,832,376	253,965,866	256,833,104	239764050
Vodafone	133,299,083	134,817,468	154,547,726	94,284,185	156,798,754
AirtelTigo	3,794,801	3,397,444	2,811,206	2,479,842	2,234,062
Glo	141,095	173,986	207,205	255,839	274,538
Total	**424,377,116**	**386,221,274**	**411,532,003**	**353,852,969**	**399,071,404**
Total					
MTN	312,381,139	278,784,250	294,163,400	306,212,854	295,042,776
Vodafone	185,008,652	198,107,434	254,853,775	175,458,470	248,989,136
AirtelTigo	5,471,401	5,115,811	4,364,880	4,144,755	3,995,824
Glo	1,039,611	1,258,789	1,564,442	1,855,040	2,089,528
Total	**501,945,009**	**483,266,284**	**554,946,497**	**487,671,118**	**550,117,264**

Table 9: Average SMS per Subscription

	Q2 2020	Q3 2020	Q4 2020	Q1 2021	Q2 2021
Total SMS (Average)	167,315,003	177,806,807	184,982,166	162,557,039	183,372,421
Mobile Subscription (Average)	40,547,599	40,473,681	40,120,522	41,198,050	41,795,710
Average SMS per Subscription	4.1	4.4	4.6	3.9	4.4

Table 10: Mobile Data Subscriptions (Prepaid/Postpaid)

Mobile Data Subscriptions		Q2 2020	Q3 2020	Q4 2020	Q1 2021	Q2 2021
Prepaid	Subscriptions	24,595,169	25,173,301	26,130,249	22,711,711	22,608,751
	Market Share %)	97.59	97.52	98.72%	99.00%	98.93%
Post-paid	Subscriptions	608,125	641,433	339,714	229,029	243,664
	Market Share %)	2.41	2.48	1.28	1.00%	1.07%
Total mobile data subscriptions		**25,203,294**	**25,814,734**	**26,469,963**	**22,940,740**	**22,852,415**

Table 11: Mobile Data Traffic in Billions of Megabytes (MB)

Mobile Operator	Q2 2020	Q3 2020	Q4 2020	Q1 2021	Q2 2021
Mobile data usage (MB)	197,623,989,682	199,503,199,952	175,611,369,727	205,383,959,042	229,082,453,700

Table 12: Mobile Internet Usage per Subscription (MB)

Mobile Operator	Q2 2020	Q3 2020	Q4 2020	Q1 2021	Q2 2021
Average Mobile data usage (MB)	65,874,663,227	66,501,066,651	62,634,127,708	68,461,319,681	76,360,817,900
Average Total Subscription	25,242,452	25,625,826	26,209,072	24,013,079	22,826,343
Average Data Usage per Subscription (MB)	2609.7	2595.1	2389.8	2851.0	3345.3

Table 13: Mobile Data Traffic (MB) per Operator

Mobile Operator	Q2 2020	Q3 2020	Q4 2020	Q1 2021	Q2 2021
MTN	135,550,242,371	143,363,912,915	137,170,247,517	139,889,378,482	156,551,111,192
	68.59%	71.86%	78.11%	68.11%	68.34%
Vodafone	38,594,683,077	32,215,967,959	14,720,575,836	41,765,769,242	47,425,832,605
	19.53%	16.15%	8.38%	20.34%	20.70%
AirtelTigo	18,295,463,956	18,099,179,067	17,745,451,865	17,545,739,422	18,534,563,652
	9.26%	9.07%	10.10%	8.54%	8.09%
Glo	5,183,600,278	5,824,140,011	5,975,094,509	6,183,071,896	6,570,946,251
	2.62%	2.92%	3.40%	3.01%	2.87%
Total Industry Traffic (MB)	**197,623,989,682**	**199,503,199,952**	**175,611,369,727**	**205,383,959,042**	**229,082,453,700**

Table 14: Average Mobile Tariff per Service (GHp)

Tariff	Q2 2020	Q3 2020	Q4 2020	Q1 2021	Q2 2021
Average on-net mobile tariff	0.12	0.12	0.12	0.12	0.12
Average off-net mobile tariff	0.13	0.13	0.13	0.12	0.13
Average on-net SMS tariff	0.05	0.05	0.05	0.05	0.05
Average off-net SMS tariff	0.06	0.06	0.06	0.06	0.06
Average data/Mb tariff	0.09	0.09	0.08	0.08	0.08

Table 15: BWA Data Subscriptions and Penetration

BWA Operator	Q2 2020	Q3 2020	Q4 2020	Q1 2021	Q2 2021
Subscription	46,575	43,657	42,192	53,101	53,263
Growth rate (%)	-0.94%	-6.27%	-3.36%	25.86%	0.31%
Net Additions	-444	-2,918	-1,465	10909	162
Population	30,554,178	30,737,870	30,922,666	31,108,574	31,108,574
Penetration Rate (%)	0.15%	0.14%	0.14%	0.17%	0.17%

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

BWA operator	Subscription and Market Share	Q2 2020	Q3 2020	Q4 2020	Q1 2021	Q2 2021
Surfline	Subscription	43,808	40,992	40,462	43,511	43,462
	Market share (%)	94.06%	93.90%	95.90%	81.94%	81.60%
					6,693	6,310
Busy					12.60%	11.85%
	Subscription	1,711	1,069	1,730	1,725	2,435
Telesol	Market share (%)	3.67%	3.69%	4.10%	3.25%	4.57%
	Subscription	1,056	1,056	-	1,056	1,056
BBH	Market share (%)	2.27%	2.42%	-	1.99%	1.98%
BLU	Subscription	-	-	-	116	
	Market share (%)	-	-	-	0.22%	
Industry Total		**46,575**	**43,657**	**42,192**	**53,101**	**53,263**

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

BWA operator		Q2 2020	Q3 2020	Q4 2020	Q1 2021	Q2 2021
Surfline	Data usage (MB)	4,534,304,590	4,355,618,160	4,539,650,270	4,875,666,810	5,182,843,180
	Market share (%)	90.06%	89.21%	73.47%	71.13%	74.33%
Busy	Data usage (MB)				1,297,511,257	1,237,829,479
	Market share (%)				19.15%	17.75%
BBH	Data usage (MB)	162,793,380	166,554,120	160,073,400	156,318,030	157,627,020
	Market share (%)	3.23%	3.41%	2.59%	2.28%	2.26%
BLU	Data usage (MB)	-	-	82,193,014	121,838,581	
	Market share (%)	-	-	1.33%	1.78%	
Telesol	Data usage (MB)	337,791,640	360,497,460	383,119,904	403,392,124	394,015,521
	Market share (%)	6.71%	7.38%	6.20%	5.88%	5.65%
Industry Total (MB)		**5,034,889,610**	**4,882,669,740**	**6,178,537,375**	**6,854,726,802**	**6,972,315,200**

Table 18: Internet Usage per BWA Subscriptions (MB)

BWA Operator	Q2 2020	Q3 2020	Q4 2020	Q1 2021	Q2 2021
Volume of Data Traffic(Average)	1,678,296,064	1,627,556,864	1,640,923,136	2,258,868,421	2,324,105,067
Subscription (Average)	46,760	44,651	41,873	54,968	53,313
Data Usage per Subscription (MB)	35,891.45	36,450.35	39,188.10	41,094.49	43,593.86

Table 19: Fixed Network Voice Subscriptions and penetration

Fixed Operator	Q2 2020	Q3 2020	Q4 2020	Q1 2021	Q2 2021
Vodafone	292,661	294,157	299,802	303,749	307,585
	97.65%	98.07%	97.44%	97.98%	97.59%
AirtelTigo	7,032	5,776	6,389	3,565	3,489
	2.35%	1.93%	2.08%	1.15%	1.11%
MTN	21	26	1477	2687	4093
	0.01%	0.01%	0.48%	0.87%	1.30%
Total industry subscription	299,714	299,959	307,668	310,001	315,167
Population	30,554,178	30,737,870	30,922,666	31,108,574	31,295,599
Fixed Network Penetration Rate (%)	0.98%	0.98%	0.99%	1.00%	1.01%

Table 20: Fixed Network Volume of Traffic in Minutes

Traffic	Q2 2020	Q3 2020	Q4 2020	Q1 2021	Q2 2021
On-net Fixed voice traffic	-	-	-		
Off-net fixed voice traffic	8,093,500	9,085,387	8,838,739	9,318,844	9,357,301
Total Fixed Voice Traffic	8,093,500	9,085,387	8,838,739	9,318,844	9,357,301

Table 21: Fixed Network Minute of Use per Subscriptions

Traffic (Average)	Q2 2020	Q3 2020	Q4 2020	Q1 2021	Q2 2021
Total Fixed Voice Traffic	2,697,833	3,028,462	2,946,246	3,106,281	3,119,100
Subscription (Average)	298,359	301,354	304,998	310,119	310,312
Minutes of Use per Subscription (MoU)	9.0	10.0	9.7	10.0	10.1
Growth Rate	-22.67%	11.14%	-3.88%	3.69%	0.35%

Table 22: Fixed Broadband Data Subscriptions and Penetration

Fixed network operator	Q2 2020	Q3 2020	Q4 2020	Q1 2021	Q2 2021
Vodafone	57,053	59,497	62,284	63,208	65,443
	75.94%	75.39%	80.87%	80.97%	72.67%
Airtel	706	703	700	674	658
	0.94%	0.89%	0.91%	0.86%	0.73%
MTN	17,373	18,724	14,038	14,186	23,951
	23.12%	23.72%	18.23%	18.17%	26.60%
Total fixed data subscription	75,132	78,924	77,022	78,068	90,052
Population	30,554,178	30,737,870	30,922,666	31,108,574	31,295,599
Fixed Data Penetration Rate (%)	0.25%	0.26%	0.25%	0.25%	0.29%

Table 23: Fixed Network Data Subscriptions per Operator

Fixed Network Operator	Q2 2020	Q3 2020	Q4 2020	Q1 2021	Q2 2021
Vodafone	57,053	59,497	62,284	63,208	65,443
	75.94%	75.39%	80.87%	80.97%	72.67%
AirtelTigo	706	703	700	674	658
	0.94%	0.89%	0.91%	0.86%	0.73%
MTN	17,373	18,724	14,038	14,186	23,951
	23.12%	23.72%	18.23%	18.17%	26.60%

Table 24: Regional Distribution of FM Stations by Purpose as at the end of Q2 2021

Name of Regions	Public	Public (Foreign)	Community	Campus	Commercial
Ashanti	2	1	12	4	76
Bono	1	-	3	2	46
Bono East	2	-	4	-	24
Ahafo	-	-	1	-	11
Central	2	-	11	3	37
Eastern	2	-	13	1	33
Greater Accra	2	3	9	4	50
Northern	3	-	7	2	38
Savannah	3	-	4	-	4
North East	1	-	4	-	7
Upper East	2	-	9	3	20
Upper West	2	-	11	2	15
Volta	3	-	4	1	37
Oti	1	-	3	-	10
Western	2	1	8	2	68
Western North	3	-	-	-	20
Total	**31**	**5**	**103**	**24**	**496**

Table 25: Regional Distribution of FM Stations as at the end of Q2 2021

Name Of Regions	Authorized FM Stations	FM Stations In Operation
Ashanti	95	79
Bono	52	40
Bono East	30	26
Ahafo	12	8
Central	53	39
Eastern	49	39
Greater Accra	68	61
Northern	50	27
Savannah	11	8
North East	12	3
Upper East	34	22
Upper West	30	18
Volta	45	36
Oti	14	9
Western	81	56
Western North	23	17
Total	**659**	**488**

Table 26: Authorised TV Stations as at the end of Q2 2021

Type of Television Service	Authorised TV stations		No. of TV Stations in Operation (Q2 2021)	No. of TV Stations not in Operation (Q2 2021)
	End of Q1 2021	End of Q2 2021		
Analogue Terrestrial Television	2	2	2	0
Digital Terrestrial Free-To-Air Television Programme Channel (Nationwide Coverage)	36	36	36	0
Digital Terrestrial Free-To-Air Television Programme Channel (Regional Coverage)	6	6	5	1
Digital Terrestrial Pay Television (Service only)	0	0	0	0
Digital Terrestrial Pay Television (Service and Frequency)	5	5	5	0
Digital Terrestrial Television (Network only)	0	0	0	0
Digital Terrestrial Radio Service on TV Multiplex	8	8	2	6
Satellite Television Broadcasting (Pay TV Direct-To-Home Bouquet)	4	4	4	0
Satellite Television Broadcasting (Free-To-Air Direct-To-Home Bouquet)	9	9	6	3
Satellite Television Broadcasting (Free-To-Air Direct-To-Home Single Channel)	63	63	46	17
Digital Terrestrial Television Additional Services (e.g. Teletext, etc.)	0	0	0	0
Digital Terrestrial Mobile Television Service (Stand-alone Authorisation)	0	0	0	0
Digital Cable Television	1	1	1	0
Television over Internet Protocol (Pay TV)	1	1	0	1
Subscription Management Service for a Satellite Television Broadcasting (Pay TV Direct-To-Home Bouquet)	1	1	1	0
Total	**136**	**136**	**108**	**28**

Source: NCA, 2021

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

- ### Accra Office

National Communications Authority
1st Rangoon Close,
Switchback Road, Cantonment, Accra
P. O. Box CT 1568,
Cantonment, Accra
Tel: +233 (0) 553 369862, (0) 553 432215
E-mail: complaints.accra@nca.org.gh

- ### Bolgatanga Office

National Communications Authority,
Zorbisi Zaare Residential Area in Bolgatanga Municipality
Private Mail Bag, Bolgatanga,
Upper East Region
Tel: +233 (0) 3820 21141
E-mail: complaints.bolgatanga@nca.org.gh

- ### Ho Office

National Communications Authority,
Plot No. 75, Stadium Road, Kabore Junction
P. O. Box HP1576, Ho, Volta Region
Tel: +233 (0) 3620 26339
E-Mail: complaints.ho@nca.org.gh

- ### Koforidua Office

National Communications Authority,
Block C along the Galloway Road
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,
Fuller Road, 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

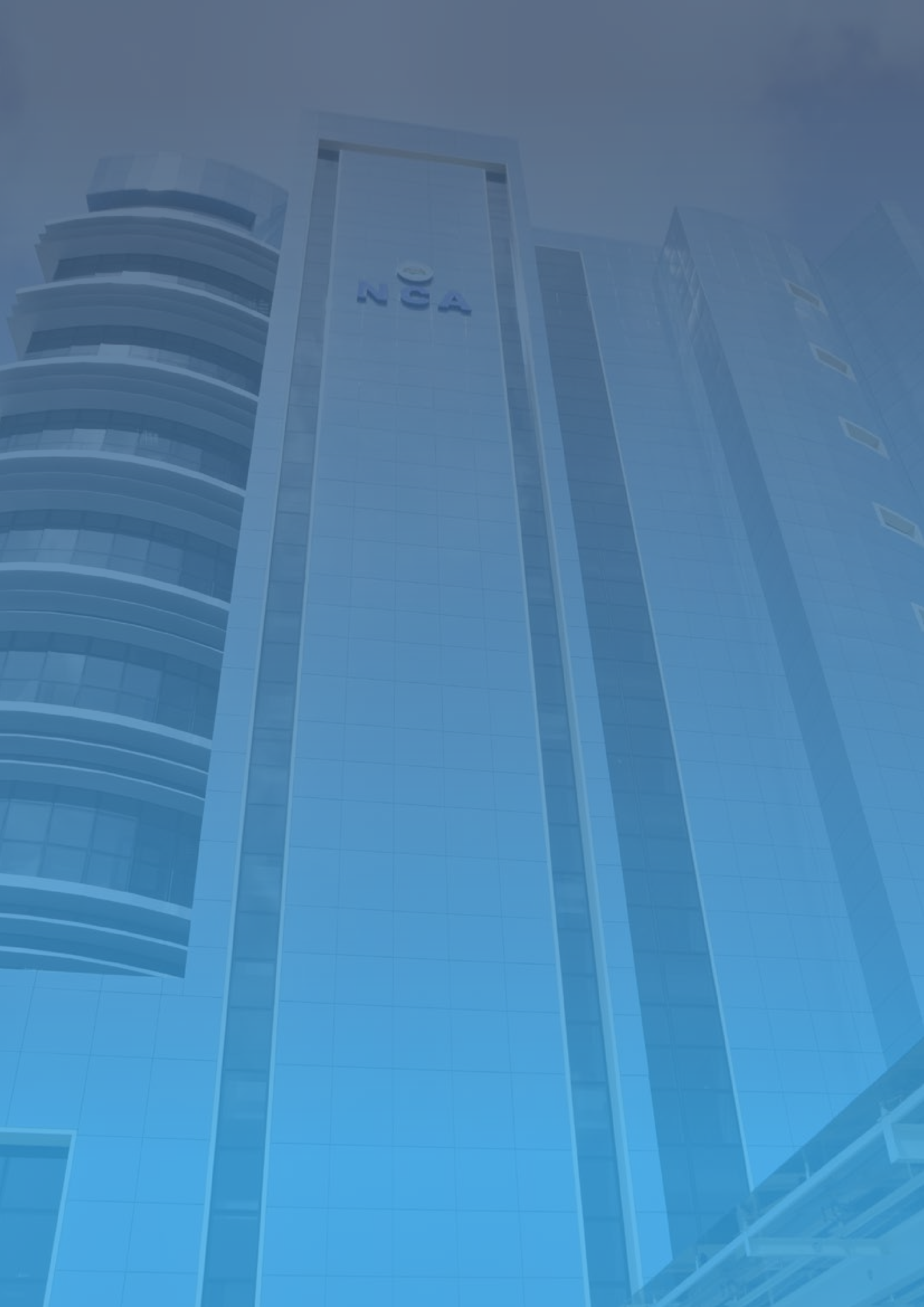
National Communications Authority,
House No 83, North Nkwabeng
P. O. Box SY125, Sunyani, Brong Ahafo Region
Tel: +233 (0) 3520 27564
E-Mail: complaints.sunyani@nca.org.gh

- ### Takoradi Office

National Communications Authority,
Bakado, 3kms away from the Prisons
(R.S.,K. Barnes Ct, Sekondi - Takoradi
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
Plot No. 3 & 4, Tamale
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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