COMMUNICATIONS INDUSTRY REPORT (CIR)

NATIONAL COMMUNICATIONS AUTHORITY

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COMMUNICATIONS INDUSTRY REPORT (2017)

National Communications Authority

Republic of Ghana

ABOUT THE REPORT

The maiden Communications Industry Report (CIR) highlights key developments in the communications industry of Ghana between the periods 2012 to 2017. The scope of the report focuses on mobile network operators, fixed networks operators, broadband wireless access providers, internet service providers, infrastructure tower companies as well as television and radio broadcasting.

The report provides critical statistical data for policy makers, telecom analysts, consumers, academia, investors and other stakeholders to support decision-making. It is data-centric and combines concise year-on-year analysis of the trends in the industry with substantial use of tables, graphs and figures for easy understanding. The report is the product of data received from the various licensees and other relevant stakeholders in the communications industry.

The publication of the Communications Industry Report (CIR) 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".

About NCA

The National Communications Authority, (NCA), was established by an Act of Parliament, Act 524 in December 1996, which was repealed and replaced by the National Communications Authority Act,2008 (Act 769). The Authority is the statutory body mandated to license and to regulate electronic communication activities and services in the country.
Vision and Mission of NCA

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

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List of Abbreviations

BWA	Broadband Wireless Access
GBC	Ghana Broadcasting Corporation
GSM	Global System for Mobile communication
ICH	Interconnect Clearinghouse
ICT	Information and Communications Technology
ISPs	Internet Service Providers
LTE	Long Term Evolution
MHz	MegaHertz
MNO’s	Mobile Network Operators
NCA	National Communications Authority
SMS	Short Message Service

Foreword by Director General

The communications industry in Ghana is rapidly expanding with innovative products and services to promote socio-economic development. This maiden edition of the Communications Industry Report (CIR) provides rich statistics on the trends of growth in the Information and Communications Technology (ICT) industry in Ghana. The publication of the CIR is expected to bridge the data availability gap, and provide stakeholders with timely, reliable and consistent indicators on the communications industry for decision making. It will also provide input for projections on the prospects of growth in the industry.

Among the key highlights of the report is the sustained uptake of broadband internet services with mobile broadband subscriptions increasing from 39 subscriptions per 100 inhabitants in 2013 to 82 subscriptions per 100 inhabitants at the end of 2017. Total internet subscriptions in Ghana at the end of 2017 was 23.5 million.

The Authority will continue to provide a sound regulatory environment to ensure the steady adoption of telecommunications services and products by individuals and institutions to support the Digital Ghana Agenda.

I want to take this opportunity to encourage readers and users of this report to share their feedback with the Authority.

JOE ANOKYE
DIRECTOR GENERAL

THE COMMUNICATIONS INDUSTRY AT A GLANCE

The table below provides a snapshot of key indicators on the communications industry in Ghana. This includes the total subscriptions, volume of traffic for voice and internet data, penetration rate and the total number of service providers in operation.

KEY COMMUNICATIONS INDUSTRY INDICATORS – AT A GLANCE

SUBSCRIPTIONS (MILLIONS)					
SUBSCRIPTION	**2013**	**2014**	**2015**	**2016**	**2017**
Mobile Voice Subscriptions	28.03	30.36	35.01	38.31	36.72
Fixed Voice Subscriptions	0.27	0.26	0.28	0.25	0.30
Mobile Data Subscriptions	10.3	15.81	18.03	19.64	23.64
Fixed Data Subscriptions	0.06	0.06	0.08	0.09	0.05
Broadband Wireless Access[1]	-	-	0.09	0.10	0.08
VOICE TRAFFIC (BILLION OF MINUTES)					
Domestic Mobile Voice Traffic	33.95	37.36	43.52	50.59	54.05
Fixed Voice Traffic	-	0.13	0.11	0.08	0.06
Incoming International Traffic	0.68	1.17	0.72	0.59	0.49
Outgoing International Traffic	0.95	1.43	0.85	0.70	0.60
DATA TRAFFIC (MILLION GB)					
Mobile Data Traffic	9.855	18.614	32.774	70.296	141.018
BWA Data Traffic	-	-	0.005	0.011	0.014
PENETRATION RATE (%)					
Mobile Voice Subscriptions	107.2	113.4	127.6	136.3	127.6
Fixed Voice Subscriptions	1.0	1.0	1.0	0.9	1.05
Mobile Data Subscriptions	39.4	59	65.7	69.9	81.5
Fixed Data Subscriptions	0.23	0.23	0.27	0.31	0.20
Broadband Wireless Access	-	-	0.33	0.37	0.30
NUMBER OF SERVICE PROVIDERS IN OPERATION					
Mobile Network Operators	6	6	6	6	5
Fixed Network Operators	2	2	2	2	2
Broadband Wireless Access	3	3	3	3	3
Television Stations	17	20	30	51	67
FM Radio Stations	267	293	313	354	405
Tower Infrastructure Companies	3	3	3	3	3
International Submarine Cables	5	5	5	5	5

- No data available

- Broadband Access Wireless (BWA) started operations in 2015

- No Data available

CHAPTER ONE

INTRODUCTION

This introductory chapter provides a brief overview of the various chapters in the Communications Industry Report 2017. The six chapters in the report provides year-on-year statistics on broadcasting, fixed telephone, mobile telephone, internet access and infrastructure tower companies.

Broadcasting

Chapter two provides statistics on the broadcasting industry in Ghana comprising both the television (TV) and frequency modulation (FM) broadcasting stations. As at the end of the year 2017 there were 405 FM stations and 67 TV stations in operation across the ten regions in Ghana. The Western Region has the highest number of operational FM stations (53), followed by the Brong Ahafo region (51).

Fixed telephone network

The third chapter discusses the fixed telephone network market which has two operational service providers namely Vodafone and Airtel (now AirtelTigo). Total number of fixed telephone subscriptions at the end of 2017 was 301,551 with a penetration rate of 1%. Vodafone has the largest market share of 97.8% of the total fixed voice subscriptions and Airtel has 2.2%. Total fixed broadband subscriptions for internet services at the end of 2017 was 55,627.

Mobile telephone network

Statistics on the mobile telephone industry is provided in chapter four. Total number of mobile voice subscriptions at the end of 2017 was 36,715,761 with a penetration rate of 127.6%. MTN is the largest mobile network by subscriptions, with a market share of 48.57% followed by Vodafone 24.59%. Total mobile internet data subscriptions stood at 23,464,150 at the end of 2017 with a penetration rate of 81.5%. The cumulative number of mobile numbers ported was 3,847,837 representing 10.48% of total subscriptions.

Internet access

The internet access statistics in chapter five combines total subscriptions for the fixed network operators, the mobile network operators and the broadband wireless operators (BWAs). Total internet subscriptions at the end of 2017 was 23,608,599 and total volume of internet traffic was 156 million Megabytes (MB).

Infrastructure tower companies

The last chapter for the 2017 Communications Industry Report provides an overview of the infrastructure tower industry in Ghana. Three tower companies namely American Tower Company (ATC), Helios Tower Ghana and Eaton towers are operational in Ghana. The total number of towers managed by the three tower companies was 4,271 as at the end of 2017. Tenancy ratio for the towers was 1.82, which means on average there are about two tenants sharing one tower.

CHAPTER TWO

BROADCASTING IN GHANA

2.1 Introduction

This section highlights development of the frequency modulation (FM) radio and television (TV) broadcasting industry in Ghana. Following the liberalisation of the broadcasting sector in Ghana, the number of broadcasting entities has expanded exponentially, with a total of 405 FM radio stations and 67 television (TV) stations operational at the end of 2017.

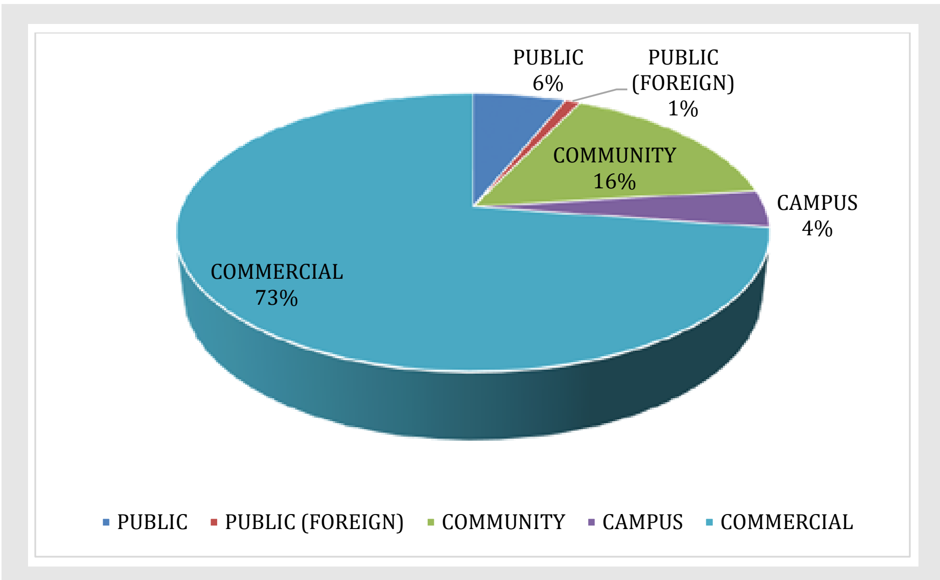
2.2 Frequency Modulation (FM) Broadcasting Sector

The total number of operational FM stations at the end of 2017 were 405 representing 79.25% of the total authorized FM stations (511), whilst the remaining 106 FM stations (20.75%) are non-operational. The authorised FM stations are classified as commercial, public, public foreign, community and campus FM stations, based on the purpose for the acquisition of the frequency authorisation.

2.2.1 Authorised Frequency Modulation (FM) radio stations

Private commercial radio stations account for 73 percent of all radio stations authorised, while Community Radio Stations account for 16 percent (Figure 1). Ghana's public broadcaster, GBC radio accounts for 6 percent of radio stations authorised in the country; Campus Radio stations account for 4 percent and public international radio stations account for 1 percent.

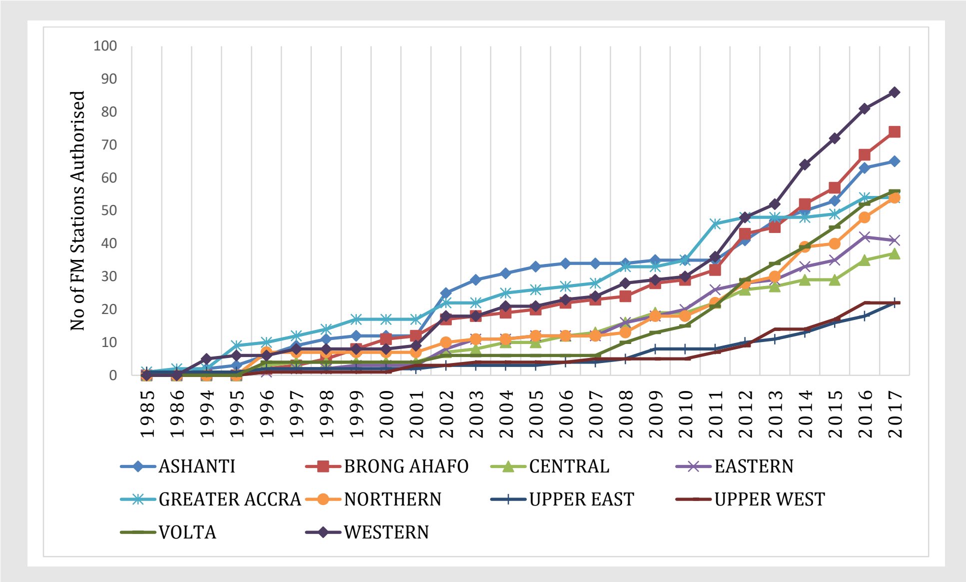
Figure 1: Distribution of Types of Authorised FM radio Stations in Ghana 2017



Source: NCA, 2017

There has been a general increase in the number of authorised FM radio stations in all the regions in Ghana as depicted in Figure 2 below.

Figure 2: Trends of Frequency Modulation FM Radio Authorisations 1985-2017



Source: NCA, 2017

Western Region has the highest (86) total authorised FM radio stations in Ghana, followed by Brong Ahafo (74) and Ashanti region (65) (Table 1). These three regions are also dominant in terms of total operational FM radio stations. Commercial FM radio station is the most popular medium of FM radio broadcasting across all the regions in the country. The regional distribution of authorised and operational FM radio stations is presented in Table 1.

Table 1: Regional Distribution of Authorised and Operational FM Radio Stations

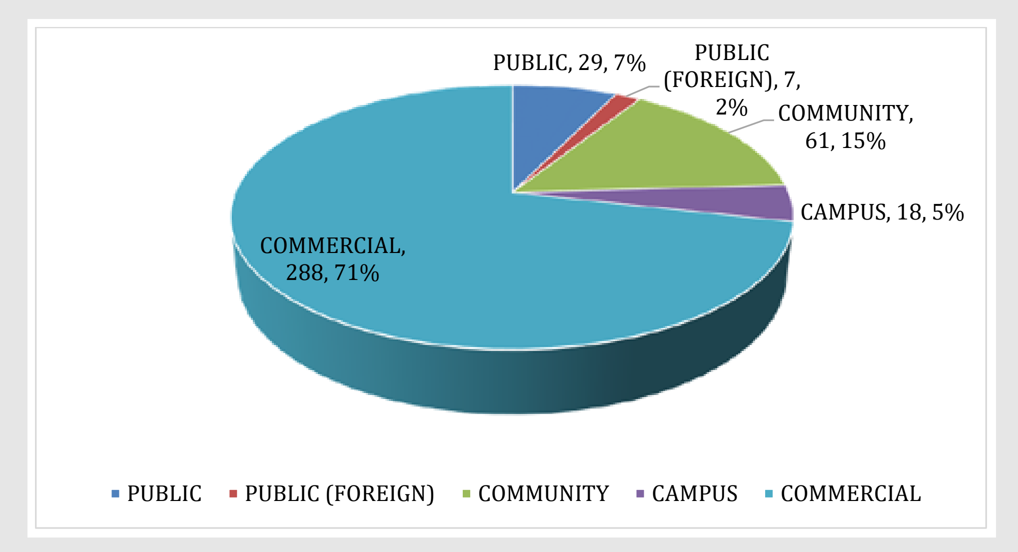
NO	NAME OF REGIONS	TOTAL NO. AUTHORISED	PUBLIC	PUBLIC (FOREIGN)	COMMUNITY	CAMPUS	COMMERCIAL	TOTAL NO. IN OPERATION	TOTAL NO. NOT IN OPERATION
1	ASHANTI	65	2	1	6	3	53	55	10
2	BRONG AHAFO	74	3	0	6	3	62	61	13
3	CENTRAL	37	2	0	9	3	23	32	5
4	EASTERN	41	2	0	6	1	32	35	6
5	GREATER ACCRA	54	2	3	6	4	39	50	4
6	NORTHERN	54	7	0	17	2	28	35	19
7	UPPER EAST	22	2	0	8	1	11	14	8
8	UPPER WEST	22	2	0	8	2	10	16	6
9	VOLTA	56	4	0	10	1	41	41	15
10	WESTERN	86	5	1	6	2	72	66	20
TOTAL		**511**	**31**	**5**	**82**	**22**	**371**	**405**	**106**

Source: NCA, 2017

2.2.2 Operational FM Radio Stations

As at the end of 2017, there were 405 operational FM radio stations in the country (Table 2). The commercial radio stations account for 71 percent of operational FM radio stations, while community radio stations account for 15 percent, Public radio accounts for 7 percent of radio stations in the country, campus radio accounts for 5 percent and Public (foreign) radio stations account for 2 percent (Figure 3).

Figure 3: Summary of Operational FM Stations



Source: NCA, 2017

Table 2: Regional Distribution of Operational FM Radio Stations in Ghana

NAME OF REGIONS	OPERATIONAL RADIO STATIONS					TOTAL NO. IN OPERATION
	PUBLIC	PUBLIC (FOREIGN)	COMMUNITY	CAMPUS	COMMERCIAL	
ASHANTI	2	1	5	3	44	55
BRONG AHAFO	3	0	6	1	51	61
CENTRAL	2	0	7	3	20	32
EASTERN	2	0	5	1	27	35
GREATER ACCRA	2	3	4	3	38	50
NORTHERN	7	0	10	1	17	35
UPPER EAST	2	0	5	1	6	14
UPPER WEST	0	2	7	2	5	16
VOLTA	4	0	7	1	29	41
WESTERN	5	1	5	2	53	66
TOTAL	29	7	61	18	288	405

Source: NCA, 2017

2.3 Television (TV) Broadcasting Sector

At the end of 2017, a total of 127 television (TV) stations[2] had been authorised to operate in the country. Out of the 127 authorised television stations, 67 were operational, but the remaining 60 stations were yet to commence operations. The authorised TV stations are grouped into fourteen (14) categories as presented in (Table 3).

Table 3: Types of Operational and Non-Operational TV Stations as at the end of 2017

NO.	CATEGORIES OF TELEVISION SERVICE	TOTAL NUMBER AUTHORISED TV STATIONS	TOTAL NUMBER OF OPERATIONAL TV STATIONS	TOTAL NUMBER OF STATIONS NOT ON AIR
1	Analogue Terrestrial Television	3	3	0
2	Digital Terrestrial Free-To-Air Television Programme Channel (Nationwide Coverage)	31	24	7
3	Digital Terrestrial Free-To-Air Television Programme Channel (Regional Coverage)	4	2	2
4	Digital Terrestrial Pay Television (Service only)	1	1	0
5	Digital Terrestrial Pay Television (Service and Frequency)	5	4	1
6	Digital Terrestrial Television (Network only)	0	0	0
7	Digital Terrestrial Radio Service on TV Multiplex	7	1	6
8	Satellite Television Broadcasting (Pay TV Direct-To-Home Bouquet)	8	5	3
9	Satellite Television Broadcasting (Free-To-Air Direct-To-Home Bouquet)	10	3	7
10	Satellite Television Broadcasting (Free-To-Air Direct-To-Home Single Channel)	57	24	33
11	Digital Terrestrial Television additional Services (eg. Teletext, etc)	0	0	0
12	Digital Terrestrial Mobile Television Service (Stand-alone Authorisation)	0	0	0
13	Digital Cable Television	1	0	1
14	Television over Internet Protocol (Pay TV)	0	0	0
	TOTAL	**127**	**67**	**60**

Source: NCA, 2017

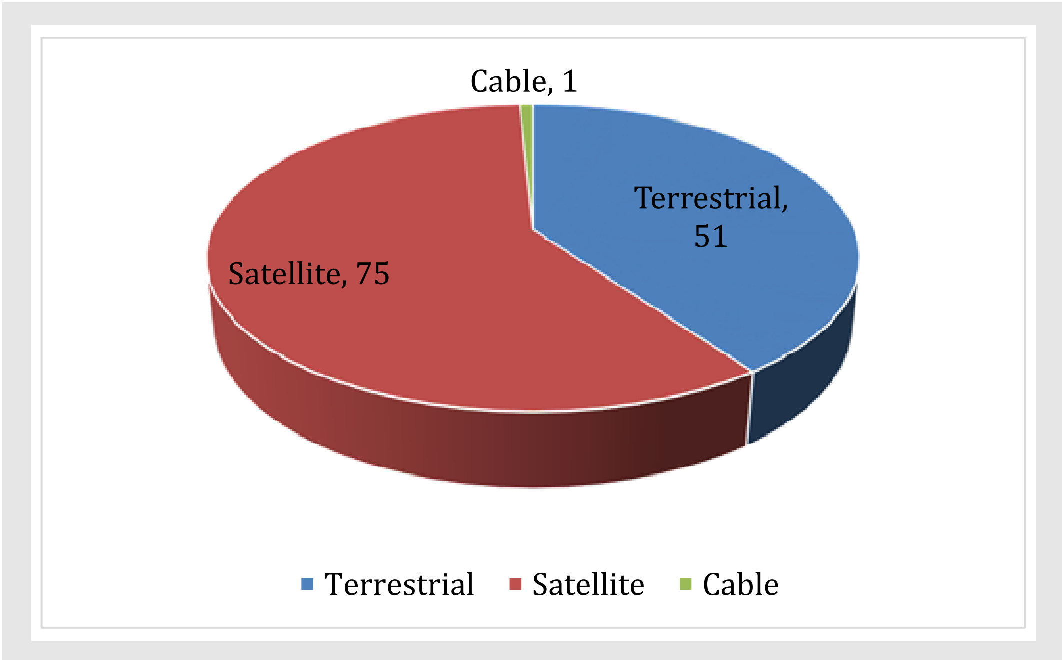
[2] Since the liberalization of the airwaves in the mid-1990s, the television (TV) market has experienced tremendous transformation with the entry of more private commercial TV broadcasting stations.

2.3.1 Platforms for TV transmission

There are three types of TV delivery platforms in Ghana namely terrestrial broadcasting, satellite broadcasting and cable broadcasting. Satellite broadcasting accounts for 59% of the authorised television stations, followed by terrestrial broadcasting accounting for 40%, while cable broadcasting accounting for 1% (Figure 4).

Amongst the three TV delivery platforms, terrestrial, remains the only platform that uses analogue technology for its transmission, pending migration to digital terrestrial television (DTT) transmission. Satellite TV is the main pay television service offered in Ghana. The cable broadcasting platform had only one provider authorised but yet to commence operation as at end of 2017.

Figure 4: Number of authorised TV stations by mode of transmission

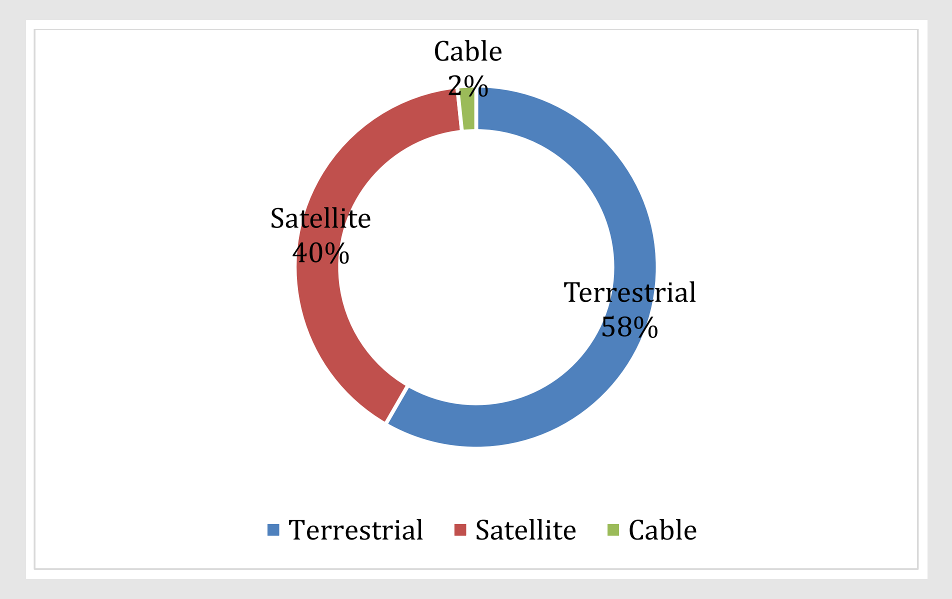


Source: NCA, 2018

2.3.2 Operational TV stations

The total number of operational TV stations at the end of 2017 was 68. The terrestrial broadcasting TV Stations constitutes 58% whilst the satellite broadcasting represents 40 percent. The remaining 2% comes from the cable broadcasting TV station operational in the country as at the end of 2017 (Figure 5).

Figure 5: Operational TV Broadcasting Stations as at end of Dec, 2017



Source: NCA, 2017

CHAPTER THREE

FIXED NETWORK MARKET

3.1 Introduction

This section provides an overview of the fixed telephone sector in Ghana, indicating total subscriptions and distribution of volumes of traffic. There are three fixed telephone services providers namely Vodafone (formerly Ghana Telecom), Airtel (now AirtelTigo) and MTN. MTN is however, yet to commence commercial operations of fixed telephone services.

3.2 Fixed Voice Subscriptions and Penetration Rate

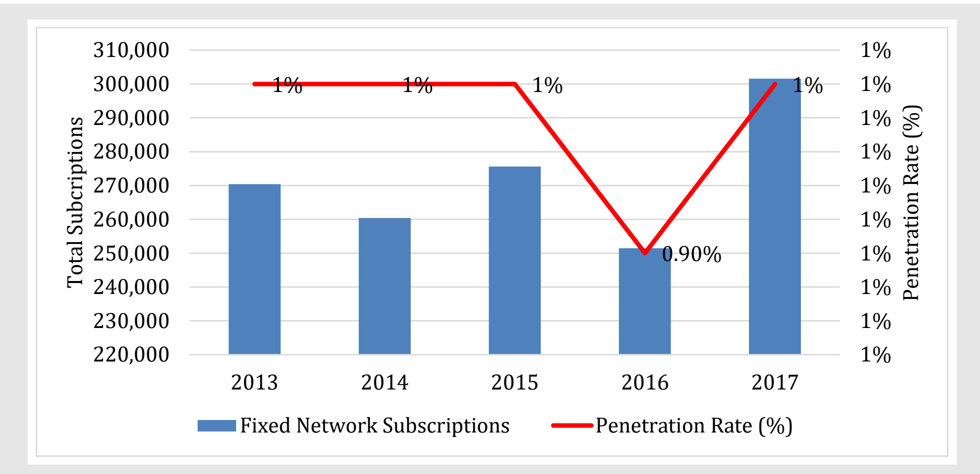
The total number of fixed voice subscriptions in 2017 was 301,551, representing a growth rate of 19.9% compared to 251,490 subscriptions in 2016 (Table 4). The penetration rate[3] was 1% at the end of 2017 (Figure 6).

Table 4: Fixed Network Subscriptions (Voice) and Penetration Rate

Subscription	2013	2014	2015	2016	2017
Fixed Network Subscription	270,422	260,407	275,570	251,490	301,551
Growth Rate (%) in Subscription	-5.11	-3.70	5.82	-8.74	19.9
Net Additions	-14,559	-10,015	15,163	-24,080	50,061
Country Population[4]	26,554,855	27,218,727	27,899,195	28,596,675	28,776,565
Penetration Rate (%)	**1.0**	**1.0**	**1.0**	**0.9**	**1.0**

Source: NCA; Fixed Network Operators, 2017

Figure 6: Fixed Voice Subscriptions and penetration rate



Source: NCA, 2017

[3] Penetration rate represents the total fixed telephone subscriptions per 100 inhabitants
[4] Population of Ghana was estimated based on 2010 population census figure 24,658,823 published by Ghana Statistical Service (GSS) with 2.5% annual intercensal growth rate.

3.2.1 Fixed Network Subscriptions per operator

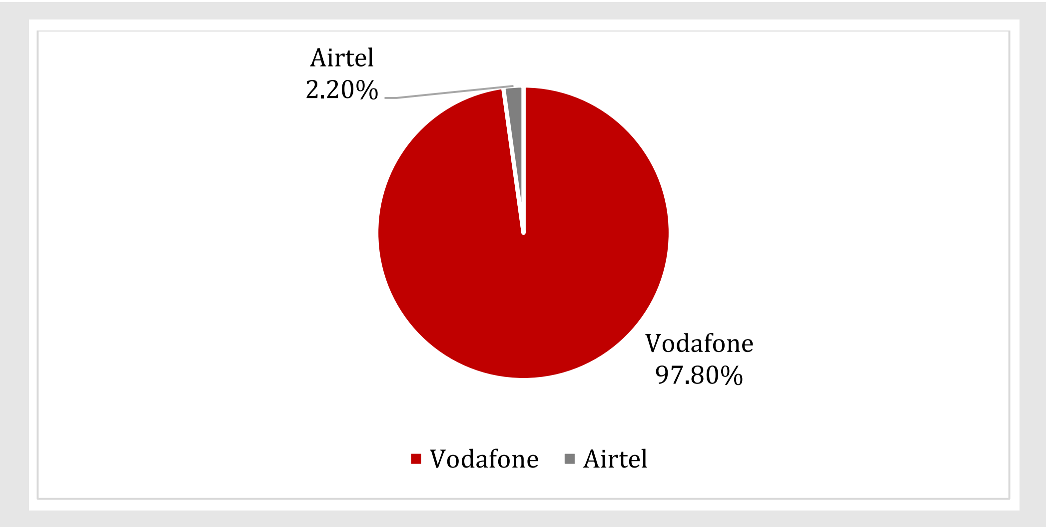
Vodafone Ghana is the largest operator by subscription, with a subscriber base of 294,915 representing 97.8 percent of the market share (Figure 7). Airtel has a subscriber base of 6,636 representing 2.2% of the market (Table 6).

Table 5: Fixed Voice Subscriptions per Operator

Fixed Network Operators		**2013**	**2014**	**2015**	**2016**	**2017**
Vodafone	Subscriptions	261,162	252,669	267,161	244,299	294,915
	Share (%)	96.6	97.0	96.9	97.1	97.8
Airtel	Subscriptions	9,260	7,738	8,409	7,191	6,636
	Share (%)	3.4	3.0	3.1	2.9	2.2
Total Industry Subscriptions		**270,422**	**260,407**	**275,570**	**251,490**	**301,551**

Source: NCA, 2017

Figure 7: Market shares of Fixed Voice Subscriptions per Operator



Source: NCA, 2017

3.3 Fixed voice traffic in minutes (On-Net and Off-Net)

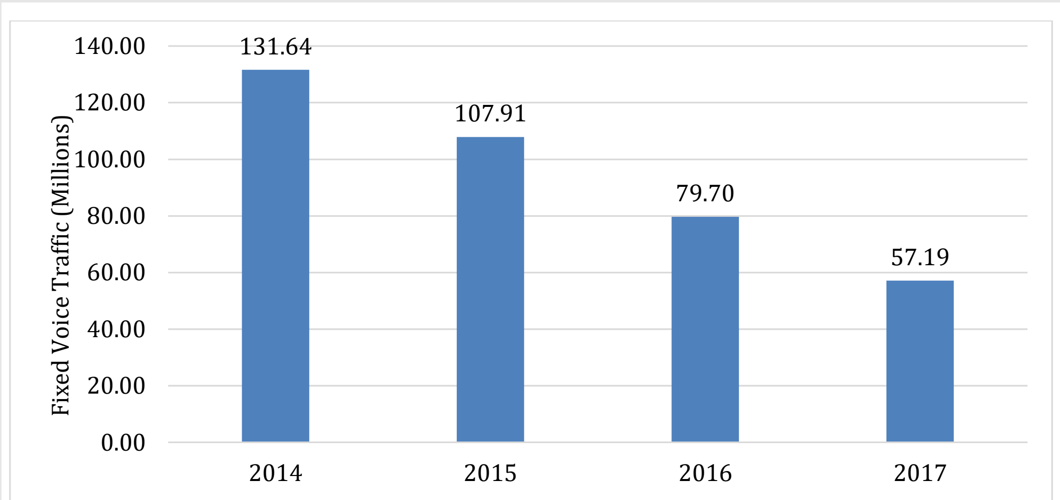
Total volume of voice traffic generated by the two fixed network operators in 2017 was 57.2 million minutes (Figure 8). Consistent with the total fixed network subscriptions, Vodafone generated 50.0 million minutes of the voice traffic representing 87.5% of the total traffic, whereas Airtel generated 7.2 million minutes representing 12.5% (Table 6).

Table 6: Fixed Voice Traffic in minutes per Operator

Mobile Network Operator		2014	2015	2016	2017
Vodafone	Traffic (Minutes)	125,366,978	100,840,926	69,400,892	50,020,696
	Shares (%)	95.2	93.4	87.1	87.5
Airtel	Traffic (Minutes)	6,277,053	7,072,077	10,297,471	7,172,581
	Shares (%)	4.8	6.6	12.9	12.5
Total Traffic (Minutes)		**131,644,031**	**107,913,003**	**79,698,363**	**57,193,277**

Source: NCA, 2017

Figure 8: Fixed Voice Traffic in minutes (millions)



Source: NCA, 2017

3.4 Fixed Internet Data Subscriptions

Total fixed data subscriptions at the end of 2017 was 56,810 subscriptions, a decrease of 34.5% compared to 86,596 subscriptions in 2016 (Figure 9). Vodafone has a market share of 97.9% of the fixed broadband market (Table 7). All the fixed data subscriptions are provided at speed in excess of the 256 kbps broadband[5] threshold of the International Telecommunications Union (ITU).

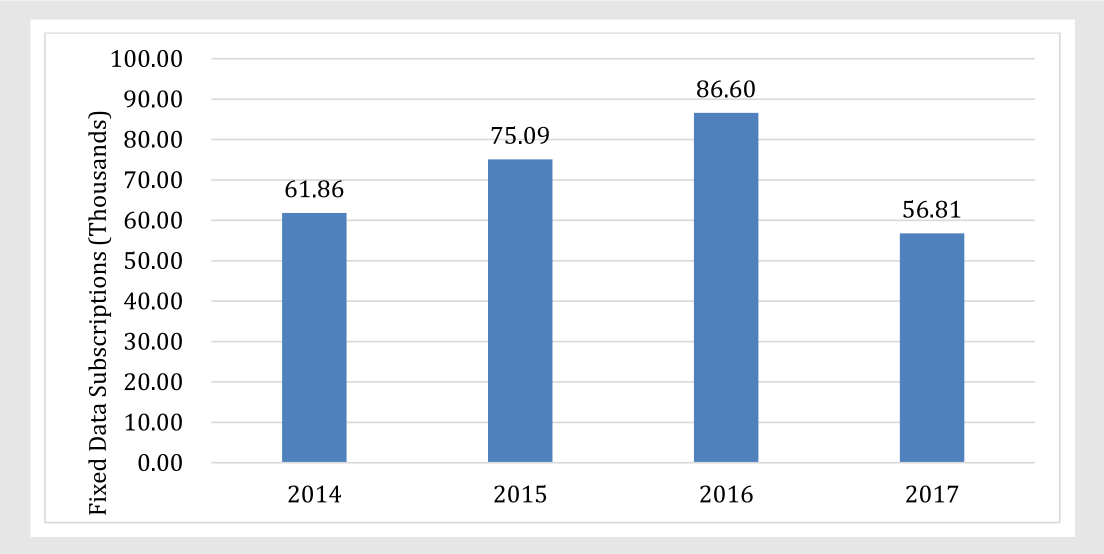
Table 7: Fixed Data Subscriptions per operator

Fixed Network Operators		2014	2015	2016	2017
Vodafone	Subscriptions	60,289	73,464	85,190	55,627
	Shares (%)	97.5	97.8	98.4	97.9
Airtel	Subscriptions	1,573	1,628	1,406	1,183
	Shares (%)	2.5	2.2	1.6	2.1
Total		**61,862**	**75,092**	**86,596**	**56,810**

Source: NCA, 2017

[5] The International Telecommunications Union (ITU) defines fixed broadband as internet speed equal to or above 256 kbps, where kbps means kilobits per second.

Figure 9: Fixed Internet Data Subscriptions in thousands



Source: NCA, 2017

CHAPTER FOUR

MOBILE COMMUNICATIONS INDUSTRY

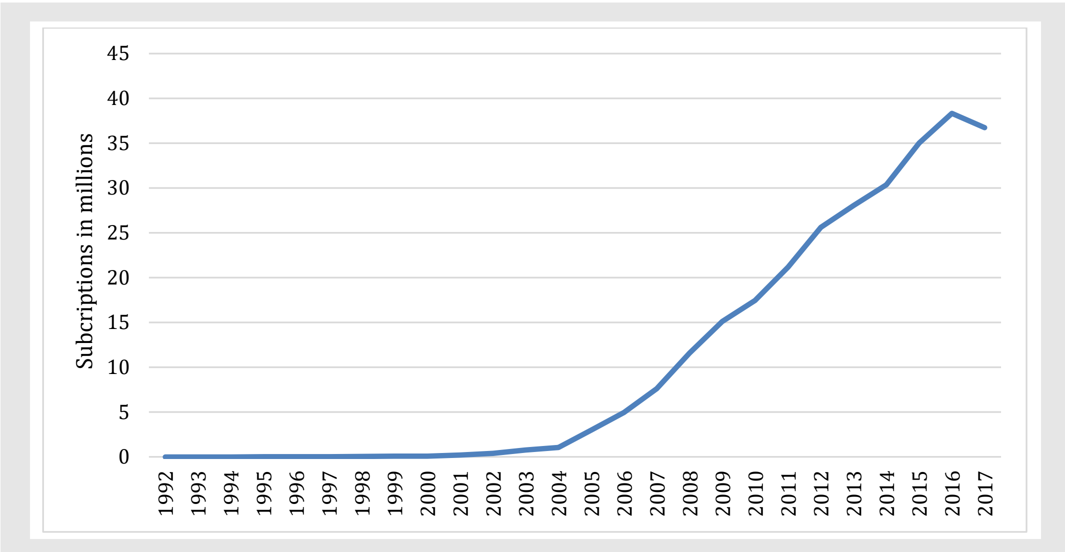
4.1 Introduction

This chapter provides information on voice subscriptions, volume of voice traffic, internet data subscriptions and traffic for all the mobile network operators. Following the merger of Airtel and Tigo into a single entity (AirtelTigo[6]) in September 2017, there are five mobile network operators in Ghana namely Vodafone, MTN, AirtelTigo, Expresso and Glo.

4.2 Mobile voice subscriptions and penetration rate

The total mobile voice subscriptions[7] at the end of 2017 was 36.7 million, representing a decrease of 4.1%, compared to 38.3 million subscriptions in 2016 (Figure 10). The liberalisation[8] of the telecoms industry contributed to the rapid growth in mobile network subscriptions, coupled with expansion in mobile network coverage across the country.

Figure 10: Mobile subscriptions in Ghana from 1992 to 2017



Source: NCA; Mobile Network Operators, 2017

Mobile penetration[9] rate in Ghana for the year 2017 was 127.6% which is lower than the 136.3% for 2016 (Figure 11). The penetration rate is in excess of 100% because of the multiple Subscriber Identification Modules (SIM) subscriptions, which is estimated at 44% of the total mobile subscriptions in Ghana, according to findings of the consumer satisfaction survey conducted by the NCA in 2016.

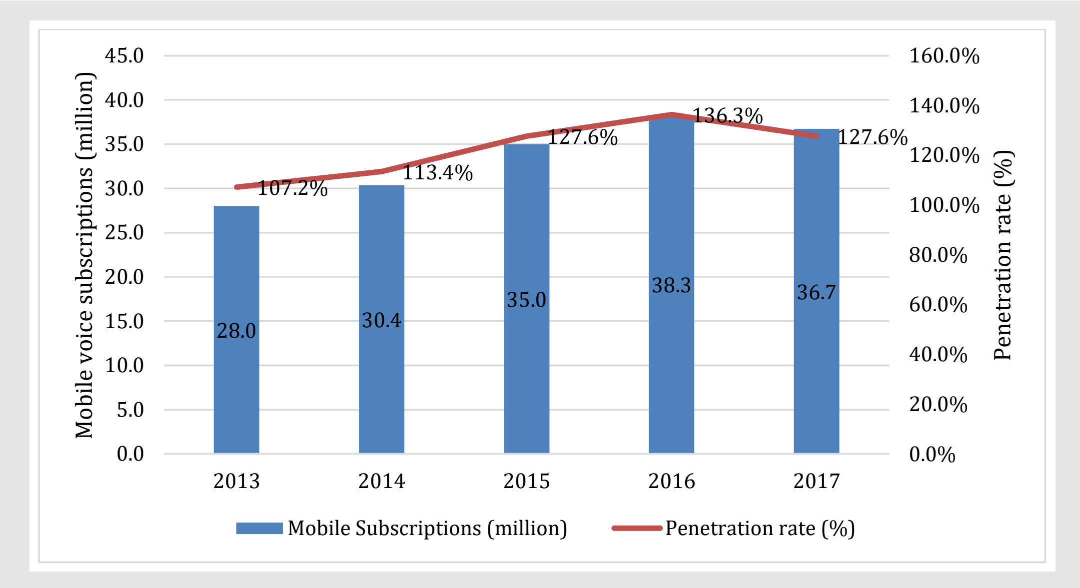
[6] Although Airtel and Tigo have merged as AirtelTigo, this report provides information on the two entities separately. Subsequent reports will treat AirtelTigo as a single entity.
[7] Mobile telephone subscriptions refer to the number of subscriptions to a public mobile service that provide access to cellular technology within the past 90 days. Mobile voice subscriptions have increased exponentially in the last two decades, growing from approximately 900 subscriptions in 1992 to 36.7 million at the end of 2017.
[8] In 2004, mobile subscriptions started to grow exponentially compared to the steady growth experienced in the previous years. This rapid growth was partly attributed to the change in the licencing regime. The yearly authorisation was changed to 15 years of licence duration and a roll-out condition enshrined in the licence. For example, mobile network operators are obliged to cover all the 10 regions in 8 years with second generation (2G) technology.
[9] Mobile penetration rate represents the total number of mobile voice subscriptions per 100 inhabitants

Table 8: Total Mobile Voice Subscriptions from 2013 to 2017

	2013	2014	2015	2016	2017
Mobile Subscriptions	28,026,482	30,360,771	35,008,387	38,305,078	36,715,761
Growth rate (%)	*9.4*	*8.3*	*15.3*	*9.4*	*-4.1*
Net Additions	2,408,055	2,334,289	4,647,616	3,296,691	-1,589,317
Population[10]	26,144,981	26,779,409	27,429,232	28,094,823	28,776,565
Penetration rate (%)	***107.2***	***113.4***	***127.6***	***136.3***	***127.6***

Source: NCA, 2017

Figure 11: Mobile Voice Subscriptions and penetration rate (2013 to 2017)



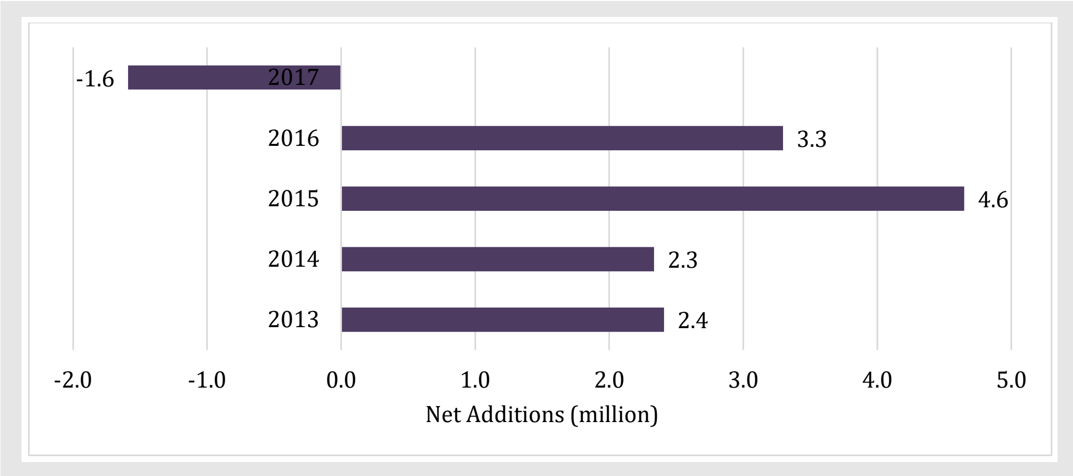
Source: NCA, 2017

4.2.1 Mobile Net Additions

The net additions[11] to mobile voice subscriptions declined by 1.3 million during the year 2017 (Figure 12). The estimation of the net additions gives an insight into the number of subscriptions that remain on the network after their initial subscriptions. Mobile network operators are keen on retaining the subscribers who join their network, and the net additions is a good metric to assess customer retention.

[10] Population of Ghana was estimated based on 2010 population census figure 24,658,823 published by Ghana Statistical Service (GSS) with 2.5% annual intercensal growth rate.
[11] The mobile net additions are calculated by subtracting the churn from the gross additions. Gross additions are the total number that subscribe to a particular network at a given time. The churn is the number of subscribers that stop using the service of the operator over a period of time.

Figure 12: Mobile subscriptions Net Additions from 2013 to 2017

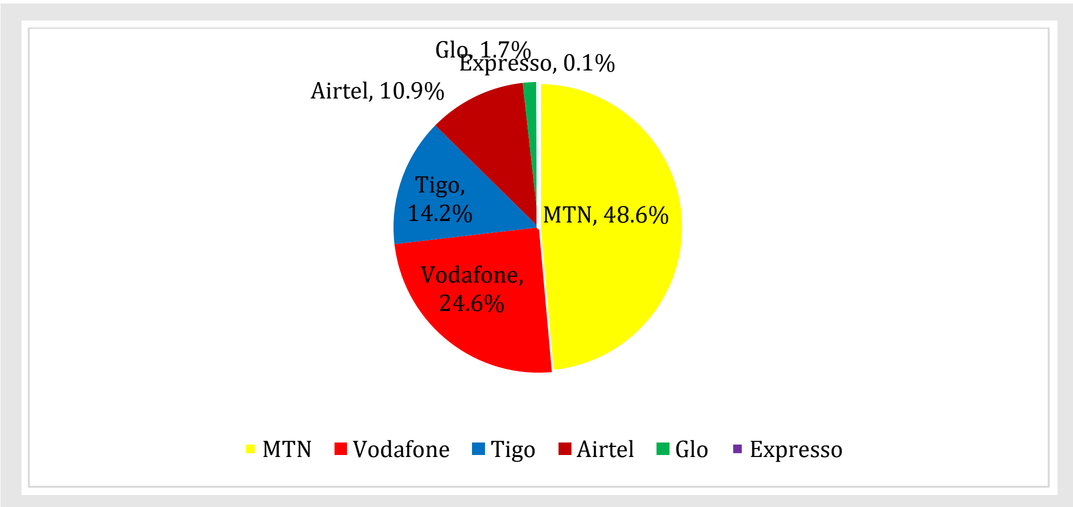


Source: NCA; Mobile Network Operators, 2017

4.2.2 Mobile Voice Subscriptions per operator

MTN is the largest mobile network operator in Ghana by subscription, with total subscriber base of 17.8 million (48.6%) followed by Vodafone 9.0 million (24.6%) and Tigo 5.2 million (14.2%). Airtel, the fourth largest operator has a subscriber base of 3.97 million (10.9%), with Glo and Expresso having subscriber base of 627,752 (1.7%) and 23,264 (0.1%) respectively (Figure 13).

Figure 13: Market shares of mobile voice subscriptions at the end of 2017



Source: NCA, 2017

Table 9: Mobile Voice Subscriptions per Operator (2013-2017)

Mobile Network Operator		2013	2014	2015	2016	2017
MTN	Subscription	12,929,528	13,852,398	16,254,984	19,296,157	17,832,546
	Share (%)	*46.13*	*45.63*	*46.43*	*50.37*	*48.57*
Vodafone	Subscriptions	6,048,792	7,069,516	7,612,059	8,289,913	9,028,161
	Share (%)	*21.58*	*23.29*	*21.74*	*21.64*	*24.59*
Tigo	Subscriptions	4,021,225	4,133,760	4,850,034	5,339,052	5,217,875
	Share (%)	*14.35*	*13.62*	*13.85*	*13.94*	*14.21*
Airtel	Subscriptions	3,395,263	3,735,656	4,796,645	4,591,051	3,986,163
	Share (%)	*12.11*	*12.30*	*13.70*	*11.99*	*10.86*
Glo	Subscriptions	1,498,011	1,450,382	1,369,402	695,306	627,752
	Share (%)	*5.34*	*4.78*	*3.91*	*1.82*	*1.71*
Expresso	Subscriptions	133,663	119,059	125,263	93,599	23,264
	Share (%)	*0.48*	*0.39*	*0.36*	*0.24*	*0.06*
Total Industry		**28,026,482**	**30,360,771**	**35,008,387**	**38,305,078**	**36,715,761**

Source: NCA; Mobile Network Operators, 2012-2017

4.2.3 Distribution of Mobile Voice Subscriptions – Pre-paid and Post-paid

In 2017, prepaid[12] subscriptions was 36.3 million accounting for 99% of total mobile subscriptions, and the post-paid[13] subscription was 440,477 representing 1.2% (Table 10).

Table 10: Distribution of Mobile Voice Pre-paid and Post-paid Subscription

Subscriptions	2013	2014	2015	2016	2017
Pre-paid	27,900,860	30,230,132	34,797,888	37,918,623	36,275,284
Share(%)	*99.55%*	*99.57%*	*99.40%*	*98.99%*	*98.80%*
Growth Rate (%)		*8.35%*	*15.11%*	*8.97%*	*-4.33%*
Post-paid	125,622	130,639	210,499	386,455	440,477
Share(%)	*0.45%*	*0.43%*	*0.60%*	*1.01%*	*1.20%*
Growth Rate (%)		*3.99%*	*39.74%*	*83.59%*	*13.98%*
Total	**28,026,482**	**30,360,771**	**35,008,387**	**38,305,078**	**36,715,761**

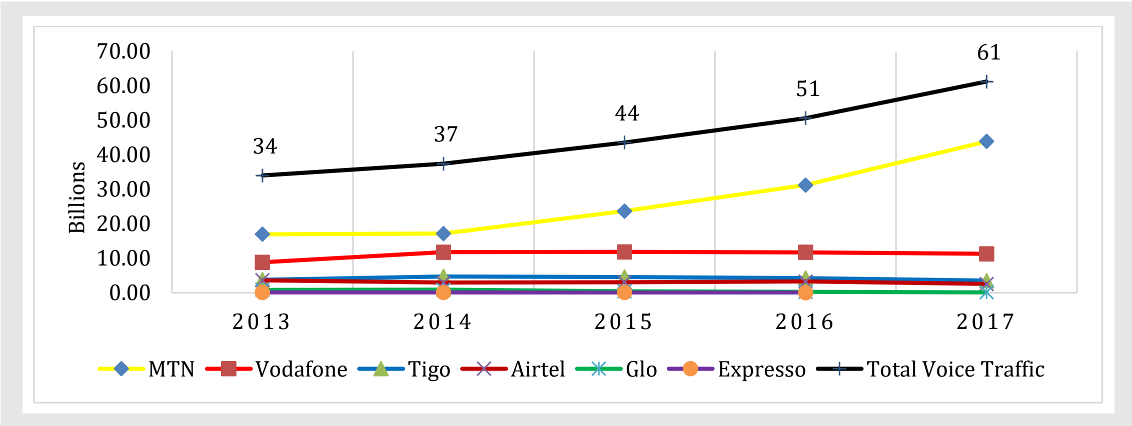
Source: NCA, 2017

4.3 Mobile Voice Traffic in minutes (Domestic)

Mobile voice traffic[14] increased to 61.2 billion minutes in 2017 from 50.6 billion minutes in 2016 at a growth rate of 20.9% (Figure 14). The growth in mobile voice traffic is consistent with the increase in mobile voice subscriptions.

[12] Prepaid customers pay for the cost of the credit before they are able to use the service.
[13] Post-paid users consume the services and make payment afterwards based on the bills they receive from the service providers.
[14] Domestic mobile-telephone traffic refers to the total number of minutes of calls made by mobile subscribers within a country (including minutes to fixed-telephone and minutes to mobile-phone subscribers). Mobile voice traffic increased steadily from about 33.9 billion minutes in 2013 to 61.2 billion minutes in 2017, reflecting compound annual growth rate (CAGR) of 12.54%.

Figure 14: Distribution of Domestic voice traffic per operator



Source: NCA, 2017

The distribution of mobile voice traffic among the operators indicates that MTN contributed 71.7% of the total traffic in 2017 followed by Vodafone 18.4% (Table 11). Glo contributed 0.2% of the total traffic, but Expresso did not submit data on volume of traffic. All the operators recorded decline in the volume of voice traffic and their corresponding market share in the year 2017 compared to 2016, with the exception of MTN, who reported increase in voice traffic and market share.

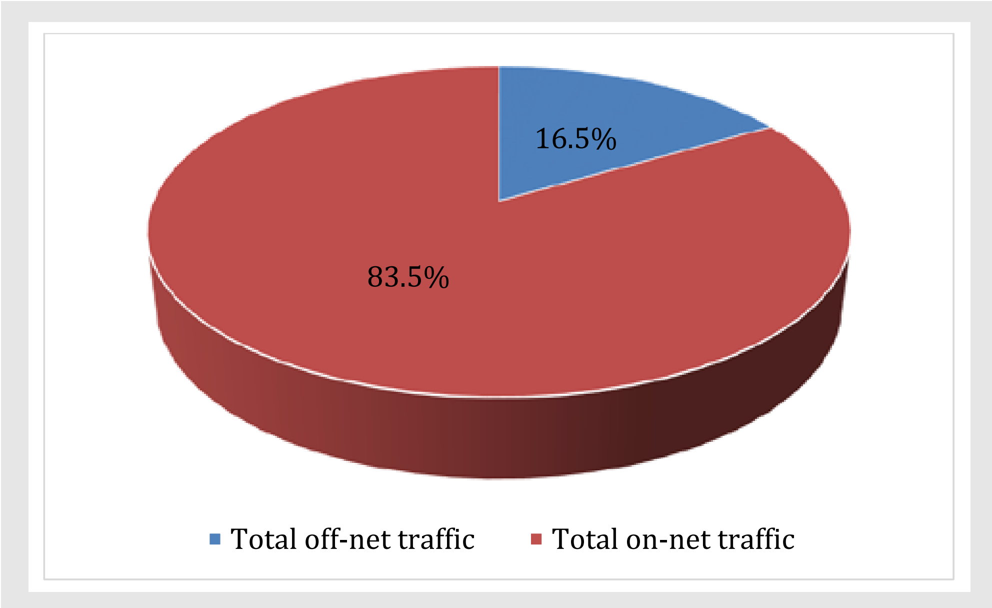
Table 11: Total Volume of Domestic Voice Traffic in Minutes per Operator

Mobile Operator		2013	2014	2015	2016	2017
MTN	Traffic	16,946,391,666	17,138,442,070	23,634,976,840	31,184,751,056	43,842,841,382
	Share (%)	*49.9*	*45.9*	*54.3*	*61.6*	*71.7*
Vodafone	Traffic	8,785,437,729	11,713,249,370	11,829,125,976	11,679,786,800	11,236,871,661
	Share (%)	*25.9*	*31.4*	*27.2*	*23.1*	*18.4*
Tigo	Traffic	3,761,472,016	4,688,927,509	4,558,278,719	4,245,289,115	3,483,638,837
	Share (%)	*11.1*	*12.6*	*10.5*	*8.4*	*5.7*
Airtel	Traffic	3,596,708,425	2,907,740,095	3,052,735,231	3,247,652,993	2,507,664,075
	Share (%)	*10.6*	*7.8*	*7.0*	*6.4*	*4.1*
Glo	Traffic	803,313,658	858,770,700	425,471,141	224,026,298	113,183,248
	Share (%)	*2.4*	*2.3*	*1.0*	*0.4*	*0.2*
Expresso	Traffic	53,696,184	49,974,235	18,346,665	5,291,716	
	Share (%)	*0.2*	*0.1*	*0.0*	*0.0*	*0.0*
Total Voice Traffic		33,947,019,677	37,357,103,979	43,518,934,571	50,586,797,979	61,184,199,203

Source: NCA, 2017

Total off-net traffic generated by the Mobile Network Operators for the year 2017 was 10.1 billion minutes, representing 16.5% of the total volume of domestic voice traffic, whereas total on-net traffic in 2017 was 51.1 billion minutes which is 83.5% of the total volume of traffic (Figure 15).

Figure 15: Distribution of total off-net and on-net domestic voice traffic in 2017



Source: NCA, 2017

Table 12: Distribution of domestic voice traffic by on-net and off-net

Mobile Operator		2013	2014	2015	2016	2017
Off-net Traffic						
MTN	Traffic	2,765,469,671	2,990,357,556	3,278,316,982	3,888,100,628	4,255,926,640
	Share (%)	*28.5*	*28.9*	*32.1*	*36.8*	*41.9*
Vodafone	Traffic	2,417,056,558	2,565,813,087	2,572,753,320	2,512,061,216	2,462,670,975
	Share (%)	*24.9*	*24.8*	*25.2*	*23.8*	*24.4*
Tigo	Traffic	1,768,191,821	2,275,971,248	2,233,038,216	2,027,185,998	
	Share (%)	*18.2*	*22*	*21.8*	*19.2*	*16.7*
Airtel	Traffic	2,029,130,863	1,793,543,356	1,751,541,058	1,926,288,336	1,623,850,598
	Share (%)	*20.9*	*17.4*	*17.1*	*18.3*	*16*
Glo	Traffic	674,485,611	668,220,349	370,668,817	194,139,275	96,413,007
	Share (%)	*7*	*6.5*	*3.6*	*1.8*	*1.0*
Expresso	Traffic	41,040,799	39,829,979	15,854,009	4,853,648	
	Share (%)	*0.4*	*0.4*	*0.2*	*0*	*0*
Total Off-net Traffic		9,695,375,323	10,333,735,575	10,222,172,402	10,552,629,101	10,129,943,968

Mobile Operator		2013	2014	2015	2016	2017
On-net Voice Traffic						
MTN	Traffic	14,180,921,995	14,148,084,515	20,356,659,858	27,296,650,428	39586914742
	Share (%)	*58.5*	*52.4*	*61.1*	*68.4*	*77*
Vodafone	Traffic	6,368,381,171	9,147,436,284	9,256,372,656	9,167,725,584	8,774,200,687
	Share (%)	*26.3*	*33.9*	*27.8*	*23*	*17.2*
Tigo	Traffic	1,993,280,195	2,412,956,261	2,325,240,503	2,218,103,117	1,792,848,277
	Share (%)	*8.2*	*8.9*	*7*	*5.6*	*3.5*
Airtel	Traffic	1,567,577,561	1,114,196,738	1,301,194,173	1,321,364,656	883,813,477
	Share (%)	*6.5*	*4.1*	*3.9*	*3*	*1.7*
Glo	Traffic	128,828,047	190,550,351	54,802,324	29,887,024	16,478,053
	Share (%)	*0.5*	*0.7*	*0.2*	*0.1*	*0.0*
Expresso	Traffic	12,655,384	10,144,256	2,492,656	438,069	
	Share (%)	*0.1*	*0*	*0*	*0*	
Total On-net Traffic		24,251,644,354	27,023,368,405	33,296,762,169	40,034,168,879	51,054,255,236

Source: NCA, 2017

4.4 International Inbound and Outbound Voice Traffic

Total volume of inbound[15] international traffic in the year 2017 was 0.49 billion minutes, which is 16.9% lower than the volume generated (0.59 billion minutes) in 2016 (Figure 16). Outbound[16] international traffic also declined to 0.58 billion minutes at the end of 2017 (Figure 16). Both inbound and outbound international traffic have been declining for the past four years.

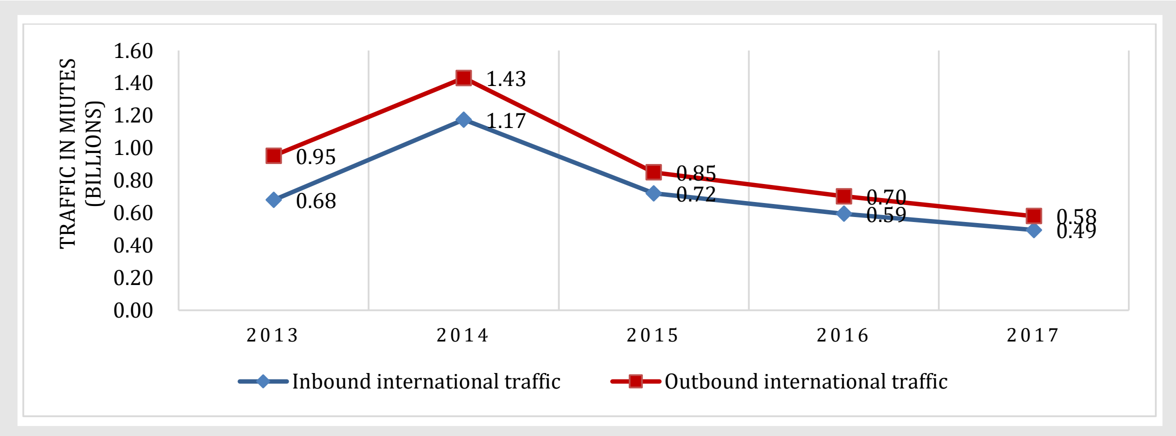
[15] Inbound international traffic comprise all traffic (phone) that originates from outside Ghana to recipient in Ghana. When you receive a call on your mobile phone in Ghana from someone who is calling from another country other than Ghana, it is counted as inbound international traffic.
[16] Outbound international is the phone calls that are generated in Ghana to recipients abroad

Table 13: International Incoming and Outgoing Traffic

Traffic	2013	2014	2015	2016	2017
Inbound international traffic					
Traffic	679,483,448	1,174,003,486	719,702,636	594,721,824	494,209,745
Share(%)	41.7%	45.1%	45.9%	45.8%	46.0%
Growth(%)		72.8%	-38.7%	-17.4%	-16.9%
Outbound international traffic					
Traffic	951,505,493	1,431,497,571	849,053,748	702,405,599	580,197,745
Share(%)	58.3%	54.9%	54.1%	54.2%	54.0%
Growth(%)		50.4%	-40.7%	-17.3%	-17.4%
Total (Incoming and Outgoing)	1,630,988,941	2,605,501,057	1,568,756,383	1,297,127,423	1,074,407,490

Source: NCA, 2017

Figure 16: International voice traffic (billions of minutes) 2013 to 2017



Source: NCA, 2017

4.5 Mobile Data subscriptions

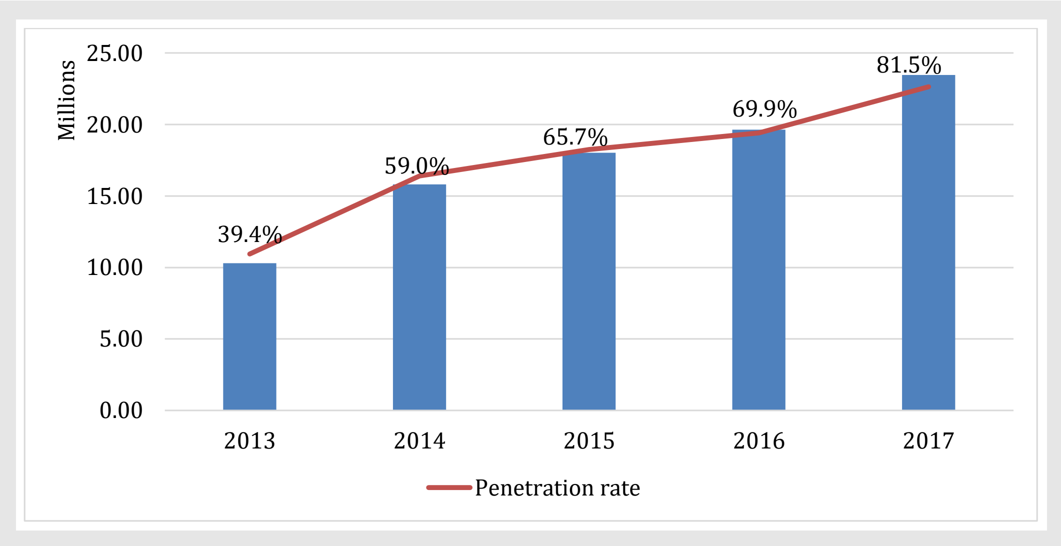
Total mobile data subscriptions in Ghana increased to 23.46 million in 2017 with a penetration rate of 81.5% (Figure 17). The expansion in 3G and 4G coverage, growth in mobile phone usage, mobile content creation, and the surge in internet-based activities are among the key drivers of the exponential growth in mobile data subscriptions. All the mobile network providers offer at least 3G connectivity to their subscribers.

Table 14: Mobile Data Subscriptions and Penetration Rate

Mobile Data Subscriptions	2013	2014	2015	2016	2017
Mobile Subscriptions	10,304,466	15,805,925	18,031,188	19,642,152	23,464,150
Growth Rate (%)	n/a	53.4	14.1	8.9	19.5
Net Addition	n/a	5,501,459	2,225,263	1,610,963	3,821,998
Population	26,144,981	26,779,409	27,429,232	28,094,823	28,776,565
Penetration rate (%)	39.4	59.0	65.7	69.9	81.5

Source: NCA, 2017

Figure 17: Mobile Data Subscriptions (millions) and penetration rate



Source: NCA, 2017

4.5.1 Mobile internet data subscriptions per operator

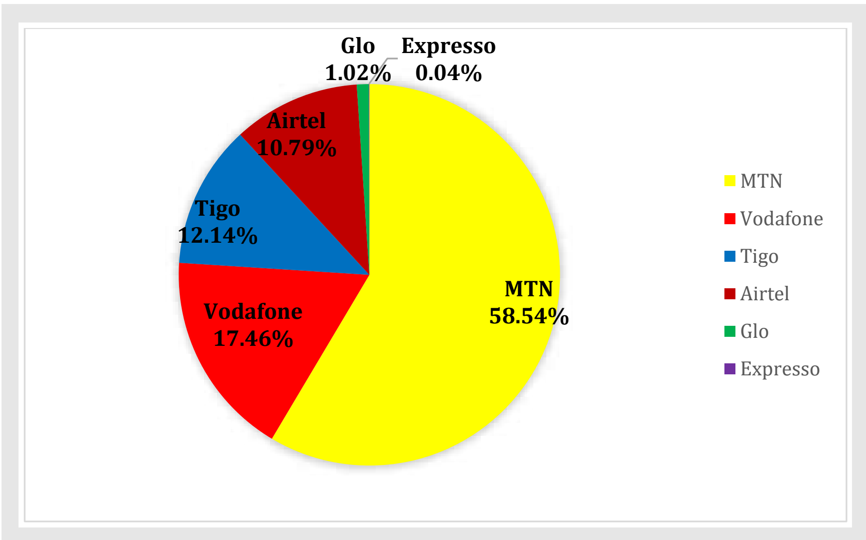
MTN is the market leader with internet data subscriptions of 13.7 million representing 58.5% market share, followed by Vodafone with 4.1 million data subscriptions with 17.5% market share (Table 15). Tigo had 2.85 million subscriptions on its network with a market share of 12.1%, and Airtel, the fourth largest operator had 2.5 million subscriptions with market share of 10.8%. Glo had a total subscription of 0.24 million at the end of 2017 representing 1% of the market, and Expresso had the least market share of almost 0% with total of 10,151 subscriptions (Figure 18).

Table 15: Mobile Internet Data Subscriptions per Operator (2013 to 2017)

Mobile Network Operator		2013	2014	2015	2016	2017
MTN	Subscriptions	4,876,302	8,004,721	8,634,914	10,226,520	13,736,988
	Market Share (%)	*47.3*	*50.6*	*47.9*	*52.1*	*58.5*
Vodafone	Subscriptions	1,596,053	2,868,249	3,316,343	3,474,090	4,097,805
	Market Share (%)	*15.5*	*18.1*	*18.4*	*17.7*	*17.5*
Tigo	Subscriptions	1,577,348	2,097,167	2,732,863	2,725,489	2,848,021
	Market Share (%)	*15.3*	*13.3*	*15.2*	*13.9*	*12.1*
Airtel	Subscriptions	1,915,300	2,130,033	2,879,431	2,902,009	2,532,873
	Market Share (%)	*18.6*	*13.5*	*16.0*	*14.8*	*10.8*
Glo	Subscriptions	301,283	668,424	419,459	277,372	238,312
	Market Share (%)	*2.9*	*4.2*	*2.3*	*1.4*	*1.0*
Expresso	Subscriptions	38,180	37,331	48,178	36,672	10,151
	Market Share (%)	*0.4*	*0.2*	*0.3*	*0.2*	*0.0*
Total		10,304,466	15,805,925	18,031,188	19,642,152	23,464,150

Source: NCA, 2017

Figure 18: Internet Data Subscriptions Market Share per Mobile Network Operator 2017

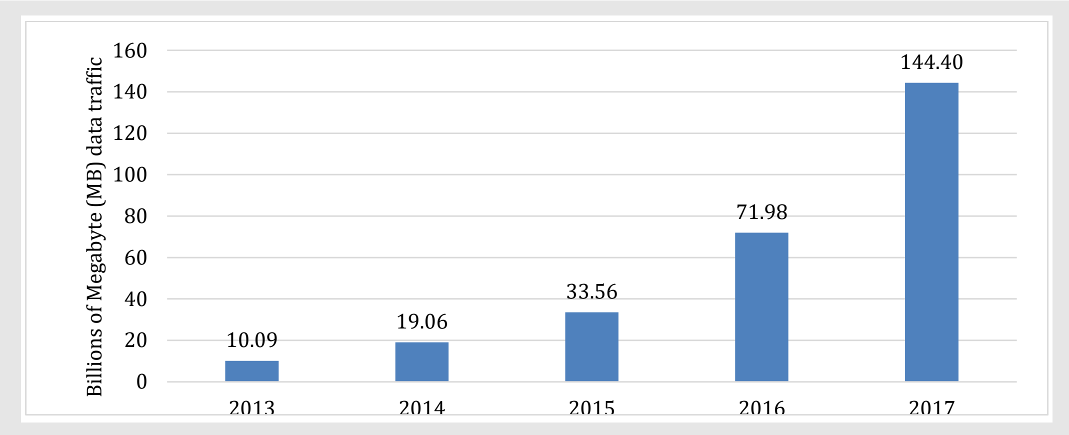


Source: NCA, 2017

4.6 Mobile Internet Data Traffic

Total volume of mobile data traffic generated by all the mobile network operators in 2017 amounted to 144.40 billion megabyte (MB), with a growth rate of 100.1% compared to 71.98 billion megabytes in 2016 (Figure 19). Data traffic is surging drastically, because of the increase in the uptake of internet-enabled devices and services.

Figure 19: Mobile Data Traffic in Billions of Megabyte (MB) from 2013 to 2017



Source: NCA, 2017

4.6.1 Mobile data traffic in megabyte (MB) per operator

MTN generated about 52.3% of the total data traffic generated in 2017, followed by Vodafone which generated 21.9% of the traffic (Table 16). Airtel generated the third largest volume of internet traffic (14.5%) with Tigo having a share of 8.2% of the traffic generated. Glo generated the rest of the 3.1% of the total volume of traffic in the market. Expresso did not submit data on the total traffic generated.

Table 16: Total Volume of internet data traffic in megabyte (MB) per operator

Mobile Network Operator		2013	2014	2015	2016	2017
MTN	Data Traffic (MB)	2,717,285,221	7,756,388,025	12,516,113,284	31,846,288,192	75,455,990,513
	Market Share (%)	*26.9*	*40.7*	*37.3*	*44.2*	*52.3*
Vodafone	Data Traffic (MB)	1,911,166,939	3,806,551,373	10,095,526,716	17,791,093,515	31,619,137,935
	Market Share (%)	*18.9*	*20*	*30.1*	*24.7*	*21.9*
Tigo	Data Traffic (MB)	3,461,504,742	4,387,421,704	2,828,858,446	5,855,058,096	11,859,039,560
	Market Share (%)	*34.3*	*23*	*8.4*	*8.1*	*8.2*
Airtel	Data Traffic (MB)	1,653,087,630	2,784,277,322	7,995,667,000	14,831,407,635	20,967,265,424
	Market Share (%)	*16.4*	*14.6*	*23.8*	*20.6*	*14.5*
Glo	Data Traffic (MB)	7,137,404	70,332,895	82,975,022	1,659,745,592	4,500,688,049
	Market Share (%)	*0.1*	*0.4*	*0.2*	*2.3*	*3.1*
Expresso	Data Traffic (MB)	341,019,348	255,711,769	41,578,980	-	-
	Market Share (%)	*3.4*	*1.3*	*0.1*	-	-
Total		10,091,201,285	19,060,683,087	33,560,719,448	71,983,593,031	144,402,121,481

Source: NCA, 2017

4.7 Mobile Money Services

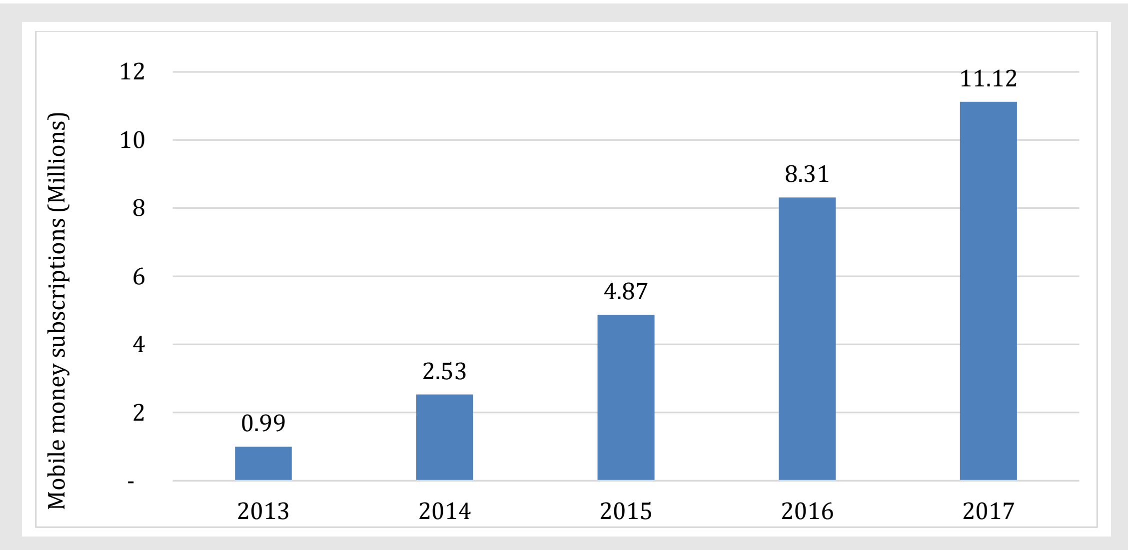
Total active mobile money[17] subscriptions at the end of 2017 was 11.1 million, which represents annual growth rate of 33.8% compared to 8.3 million subscriptions in 2016 (Table 17). The total mobile money subscriptions have been increasing steadily since 2013 (Figure 20). The volume and value of cash transactions conducted via mobile money has equally expanded consistently over the past five years. The total value of mobile money transactions at the end of 2017 was GHC 155.8 billion (Table 17).

Table 17: Mobile Money Subscriptions and total transactions

Transactions	2013	2014	2015	2016	2017
Active mobile money subscribers	991,780	2,526,588	4,868,569	8,313,283	11,119,376
Total Volume of Transactions	40,853,559	113,179,738	266,246,537	550,218,427	981,564,563
Total Value of Transactions (GHC million)	2,652.47	12,123.89	35,444.38	78,508.90	155,844.84

Source: Bank of Ghana, 2017

Figure 20: Mobile Money Subscriptions



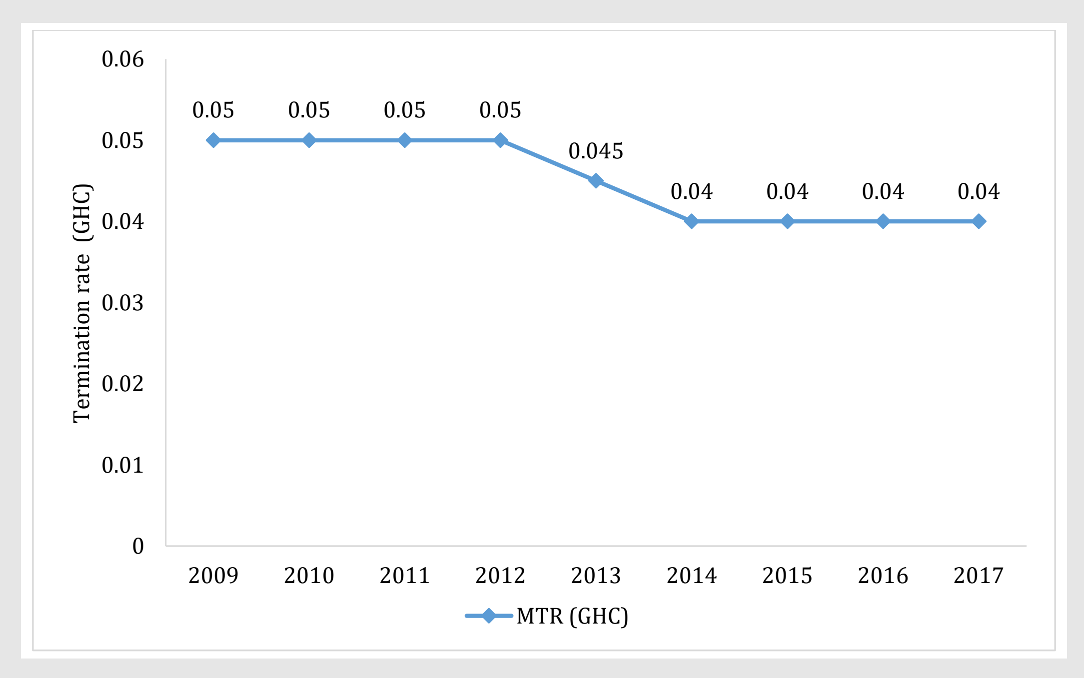
Source: Bank of Ghana, 2017

4.8 Mobile Termination Rate (MTR)

Mobile termination rate[18] (MTR) for off-net calls per minute of traffic was GHC 0.04 at the end of 2017. The wholesale mobile termination rate is charged when you make a phone call to a recipient on a different mobile network or from a fixed line to mobile network and vice versa.

[17] Mobile money[17] is a value added service (VAS) offered by the mobile network operators in Ghana, complementary to their core business of mobile telephone services providers.
[18] Termination rates are the charges which one telecommunications operator charges another for terminating calls on its network.

Figure 21: Mobile Termination Rate (MTR) in GHC

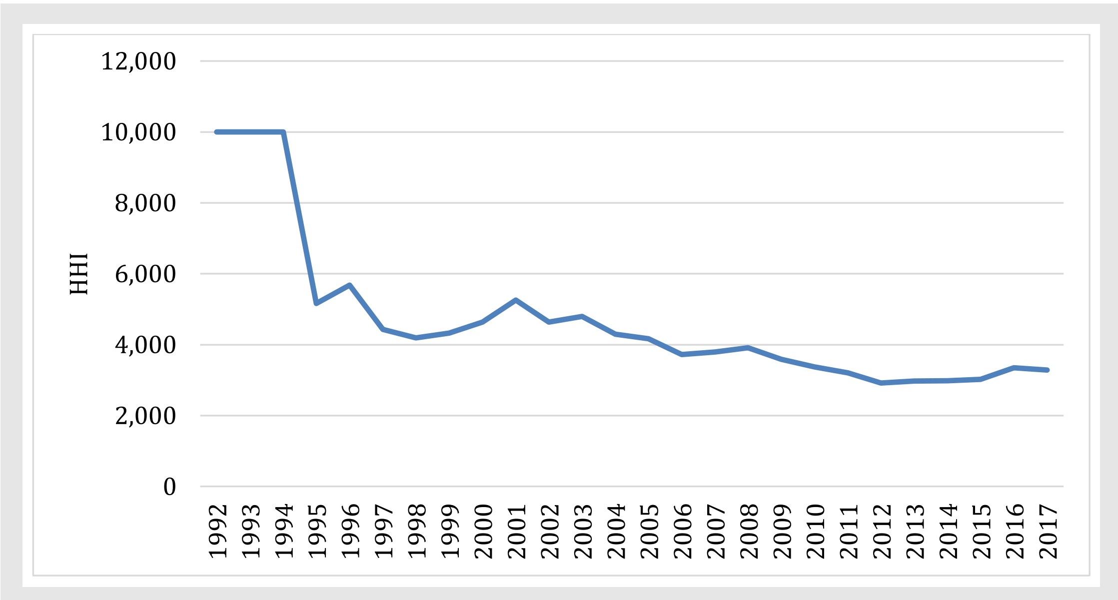


Source: NCA, 2017

4.9 Competition in the Mobile Telecommunications Sector

The Herfindahl-Hirschman Index[19] (HHI) estimate for the year 2017 was 3,268 indicting the mobile telecoms industry in Ghana is fairly concentrated (Figure 22). The HHI of the telecoms sector in Ghana have been computed for the past two decades using the market shares of the various operators. The market concentration has declined significantly over the past two decades (Figure 22).

Figure 22: Herfindahl-Hirschman Index (HHI) of the Mobile industry in Ghana



Source: NCA; Mobile Network Operators, 2016

[19] The Herfindahl-Hirschman Index (HHI) is one of the tools used to assess market concentration. It is calculated by squaring the market share of each firm in an industry, and then summing the squared figures. The index ranges from close to 0 to 10,000. The HHI for a pure monopoly would be 10,000 and perfect competitive market has HHI close to zero. The HHI helps market regulators to analyse market competition to effectively formulate best market policies to protect the integrity of the market.

4.10 Mobile Number Portability (MNP)

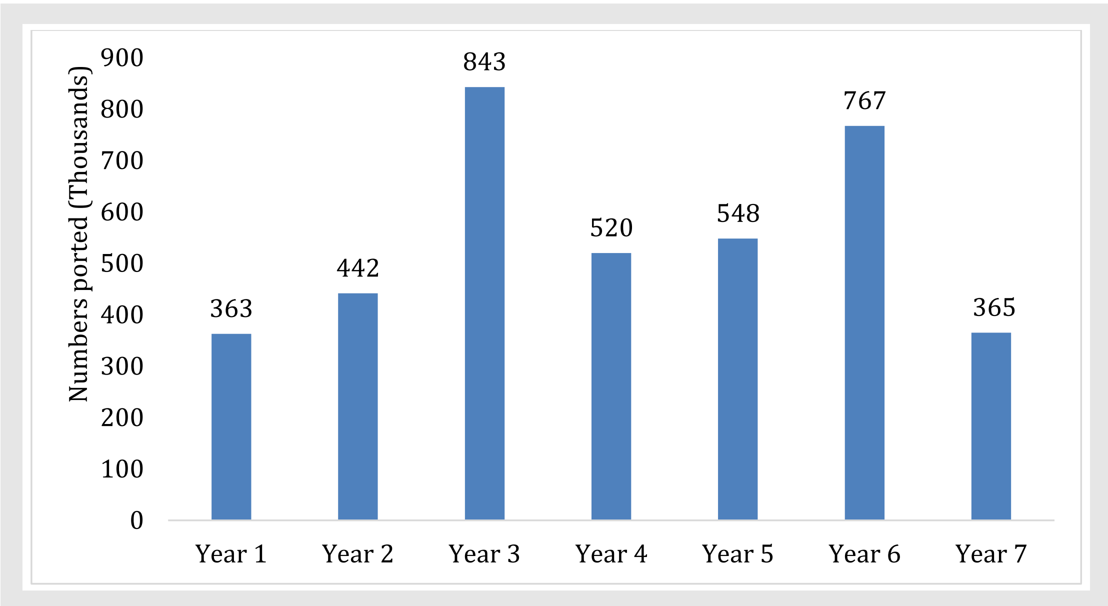
At the end of the sixth year of mobile number portability[20] (MNP) implementation in 2017, a total of 3.8 million mobile phone numbers were successfully ported from one mobile network to another (Table 18). The total mobile phone numbers ported represents 10.4% of the 36.7 million total active mobile voice subscriptions in Ghana. There were fluctuations in the mobile number portability trend since July 2011 (Figure 24).

Table 18: Yearly Mobile Number Portability (MNP)

Year	Period	Total No. of Ports	Cumulative Total Port	Growth Rate (%)
First Year (Y1)	July 7, 2011 - June 30, 2012	362,868	362,868	n/a
Second Year (Y2)	July 1, 2012 - June 30, 2013	441,576	804,444	22
Third Year (Y3)	July 1, 2013 - June 30, 2014	842,898	1,647,342	91
Fourth Year (Y4)	July 1, 2014 - June 30, 2015	519,944	2,167,286	-38
Fifth Year (Y5)	July 1, 2015 - June 30, 2016	548,000	2,715,286	5
Sixth Year (Y6)	July 1, 2016 - June 30, 2017	767,421	3,482,707	40
Seventh Year (Y7)	July 1,2017 - Dec 31,2017	365,130	3,847,837	-52

Source: NCA, 2017

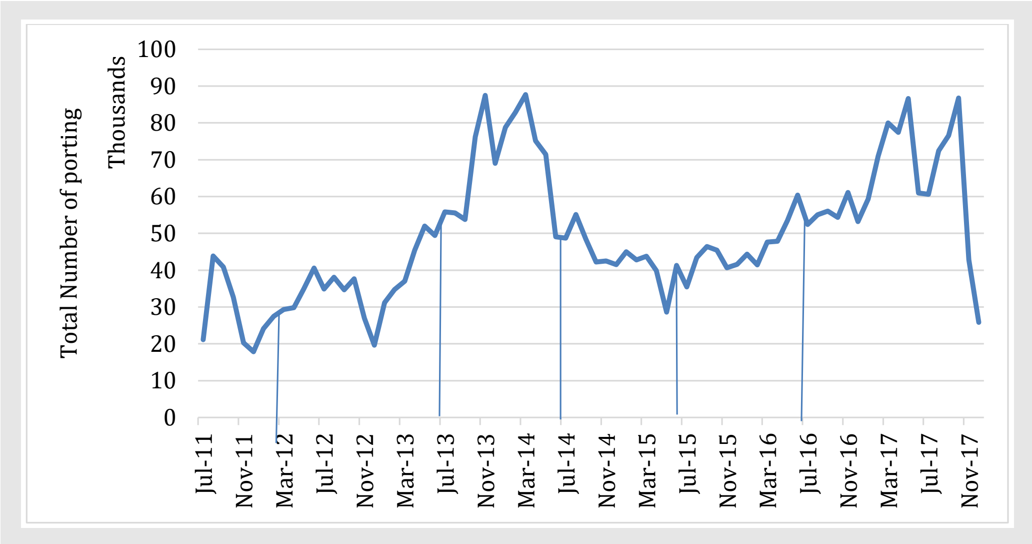
Figure 23: Total Number of Porting Incidence per year



Source: NCA, 2017

[20] Mobile Number Portability (MNP) is a service that makes it possible for a mobile telecom subscriber to change mobile service provider while retaining the same mobile phone number. It is aimed at liberalising the telecommunication sector to promote competition within the industry. Mobile Number Portability was launched successfully on 7th July, 2011 making Ghana the first country to successfully implement MNP within the West Africa sub-region.

Figure 24: Monthly MNP Porting Incidence since July 2011



Source: NCA, 2017

CHAPTER FIVE

INTERNET ACCESS

5.1 Introduction

This chapter provides information on internet[21] access and volumes of internet data traffic consumption in Ghana based on data received from the mobile network, fixed network and broadband wireless access (BWA) operators and other internet service providers.

5.2 Internet Access

There are two fixed broadband internet service providers in Ghana namely Vodafone and Airtel (now AirtelTigo). The total number of fixed broadband access from these two service providers at the end of 2017 was 56,810 as compared to the 2016 subscriptions of 86,596 recording a decline in growth of 34.40% (Table 19).

Table 19: Fixed Network Internet Access per Operator

Fixed Network Operators	2014	2015	2016	2017
Vodafone	60,289	73,464	85,190	55,627
Airtel	1,573	1,628	1,406	1,183
Total	61,862	75,092	86,596	56,810

Five mobile network service providers namely MTN, Vodafone, Tigo, Airtel and Glo provided data for the mobile broadband data access as presented in Table 20. The total mobile data access increased to 23,464,150 at the end of 2017 as compared to 19,642,152 in 2016 (Table 20). This represents a 194.58% growth in mobile internet access.

Table 20: Mobile Network Internet Access per Operator

Mobile Network Operator	2013	2014	2015	2016	2017
MTN	4,876,302	8,004,721	8,634,914	10,226,520	13,736,988
Vodafone	1,596,053	2,868,249	3,316,343	3,474,090	4,097,805
Tigo	1,577,348	2,097,167	2,732,863	2,725,489	2,848,021
Airtel	1,915,300	2,130,033	2,879,431	2,902,009	2,532,873
Glo	301,283	668,424	419,459	277,372	238,312
Expresso	38,180	37,331	48,178	36,672	10,151
Total	10,304,466	15,805,925	18,031,188	19,642,152	23,464,150

[21] **Internet access** is the ability of individuals and organizations to connect to the Internet using computer terminals, computers, and other devices; and to access services such as email and the World Wide Web. Various technologies, at a wide range of speeds have been used by Internet service providers (ISPs) to provide this service. Internet subscription and data usage has increased significantly afterwards due to advancement in technology, reduction in prices, availability of devices and ubiquitous digital evolution.

There are three Broadband Wireless Access providers in operation namely Surfline, Broadband Home (BBH) and Blu telecoms. As at the end of 2017, broadband wireless access was 87,639 from 104,402 in 2016 representing a 16.06% decline in growth.

Table 21: Broadband Wireless Access per Operator

Broadband Wireless Access	2015	2016	2017
Surfline	61,980	76,919	61,426
BBH	26,786	26,402	25,560
BLU	1,480	1,081	653
Total	**90,246**	**104,402**	**87,639**

The total number of internet data subscriptions from Fixed Networks, Mobile Networks and Broadband Wireless Access service providers at the end of 2017 was 23.6 million (Table 22). This represents a 23.03% compound annual growth rate from 10.3 million in 2013 to 23.6 million internet in 2017 (Figure 25). Internet access through mobile network operators dominates the internet market with over 90% market share (Table 22).

Table 22: Internet Access in Ghana (2013 - 2017)

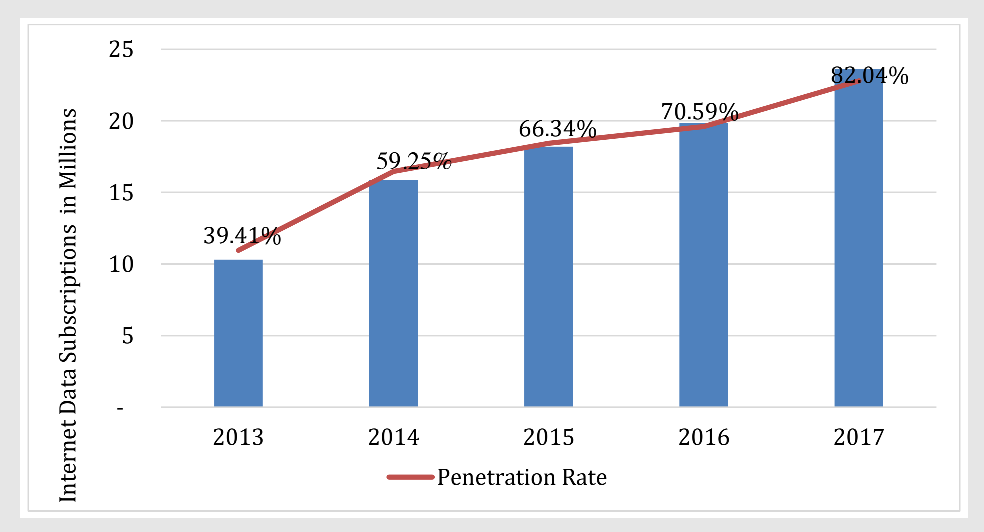
Year	Subscriptions from Mobile Network Operators	Subscriptions from Fixed Network Operators	Subscriptions from Broadband Wireless Access	Total Internet data subscriptions
2013	10,304,466	-	-	10,304,466
2014	15,805,925	61,862	-	15,867,787
2015	18,031,188	75,092	90,246	18,196,526
2016	19,642,152	86,596	104,402	19,833,150
2017	23,464,150	56,810	87,639	23,608,599

Source: NCA, 2017

Note: - means data not available

Internet penetration at the end of 2017 was 82.04%, based on the subscriptions of the fixed broadband, mobile network and broadband wireless access subscriptions (Figure 25).

Figure 25: Internet Data Subscriptions and Penetration Rate in Ghana



Source: NCA, 2017

5.3 Internet data traffic in Ghana[22]

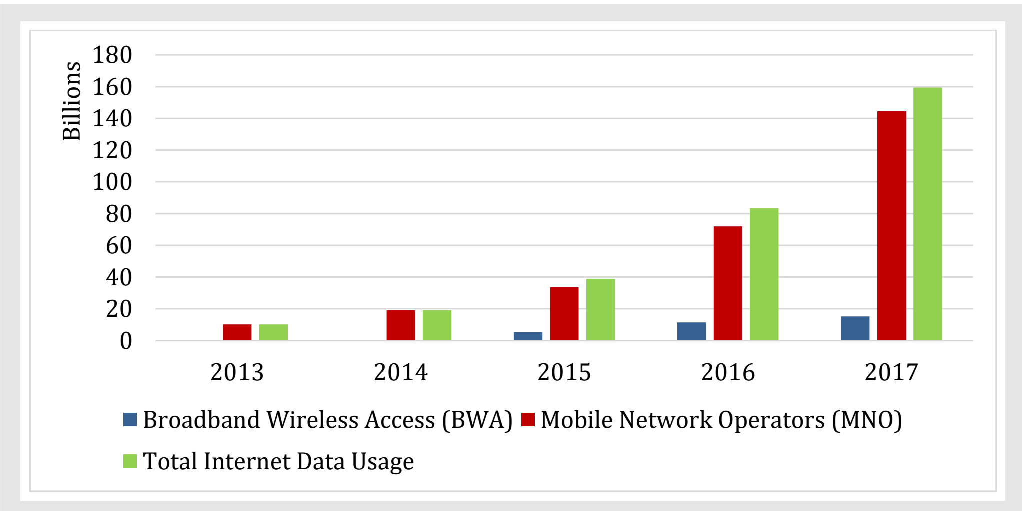
The total volume of internet traffic from the broadband wireless access and mobile network operators for the year 2017 was 159.5 billion megabyte (MB) (Table 23). The volume of internet traffic grew by almost hundred percent (91.2%) between 2016 and 2017. The growth in volume of internet data traffic has been consistent for the past five years, from 10 billion megabyte (MB) in 2013 to 156 billion MB of data traffic in 2017 which represent a compound annual growth rate of 99.4% (Figure 26).

Table 23: Total Mobile and Broadband Wireless Internet Data Usage in MB

Network Operator	2013	2014	2015	2016	2017
BWA	-	-	5,337,574,481.70	11,433,811,214.04	15,121,512,062
MNOs	10,091,201,285	19,060,683,087	33,560,719,448	71,983,593,030.73	144,402,121,480.56
Total	10,091,201,285	19,060,683,087	38,898,293,929	83,417,404,245	159,523,633,542

Source: NCA; Operators, 2017

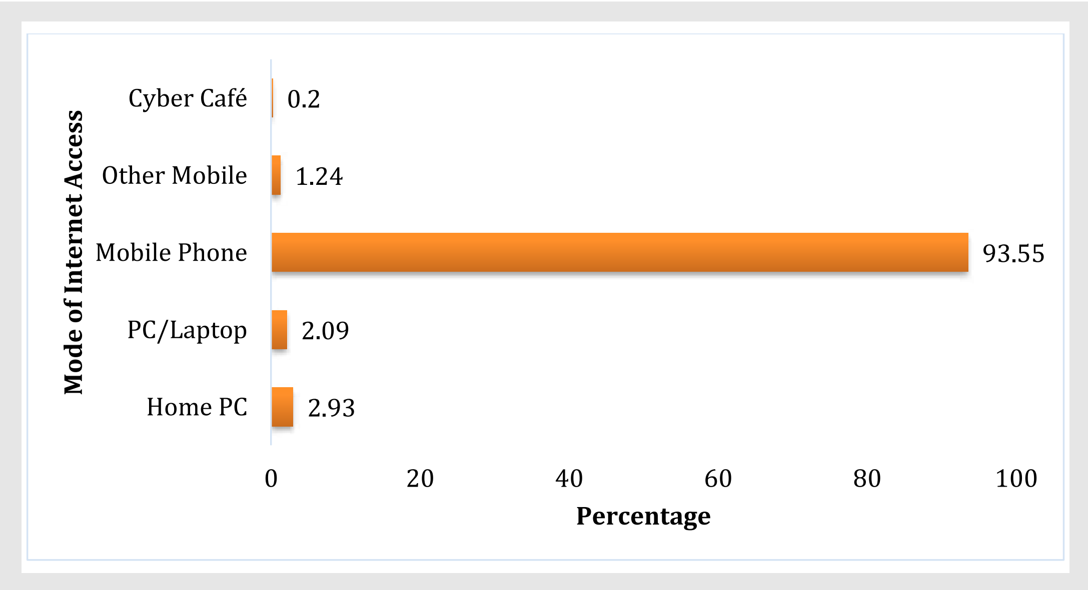
Figure 26: Total Mobile and BWA Internet Data in MB (Billion)



Source: NCA; Operators, 2017

A consumer satisfaction survey conducted by the NCA in 2016 indicate that 93.55% of the respondents access the internet through their mobile phone (Figure 27).

Figure 27: Mode of Internet Access



Source: NCA, 2016

5.4 Universal Mobile Telecommunications Services (UMTS)

The NCA took a regulatory decision on 7th September, 2017 to permit Mobile Network Operators (MNOs) with existing 2G Licences to deploy Universal Mobile Telecommunications Systems (UMTS), which is a 3G technology, in unserved and underserved communities across the country. The decision was expected to result in increased data access to areas which hitherto were not covered by MNOs with 3G services. UMTS is a third generation (3G) technology, deployed using the 900MHz frequency band which was originally assigned for the deployment of 2G services (GSM) in Ghana. The UMTS technology was originally authorised in the 2100MHz frequency band. The technology makes it easier for the mobile network operators to expand their data coverage with minimum costs especially as they can be deployed over a large area at less costs.

CHAPTER SIX

INFRASTRUCTURE TOWER INDUSTRY

6.1 Introduction

This section provides overview of the tower infrastructure companies[23] in Ghana. American Tower Company (ATC), Helios Tower Ghana Managed Services Limited (HTG) and Eaton Tower Ghana Limited are the three tower companies currently operating in Ghana (Table 24).

Table 24: Authorised Tower Companies

	Tower Company	Year of Authorisation
1	American Tower Company (ATC)	2011
2	Helios Tower Ghana Managed Services Limited (HTG)	2011
3	Eaton Tower Ghana Limited	2011

Source: NCA, 2017

6.2 Market Share of Tower Companies in Ghana

Data was received from all three tower companies namely ATC, Helios and Eaton. Total number of towers managed by the tower companies in Ghana as at the end of 2017 was 4,271. The 4,271 towers exclude all the towers held by non-tower infrastructure companies such as Glo mobile and Expresso telecom. ATC is the largest tower company in Ghana in terms of total number of towers, having a total of 2,216 towers representing 51.9 % of the total number of towers in Ghana (Table 25). Eaton Towers is the second largest with 1,277 towers representing 29.9% and the remaining 778 towers are managed by Helios with 18.2% market share.

Table 25: Market Share of Tower Companies in Ghana (2017)

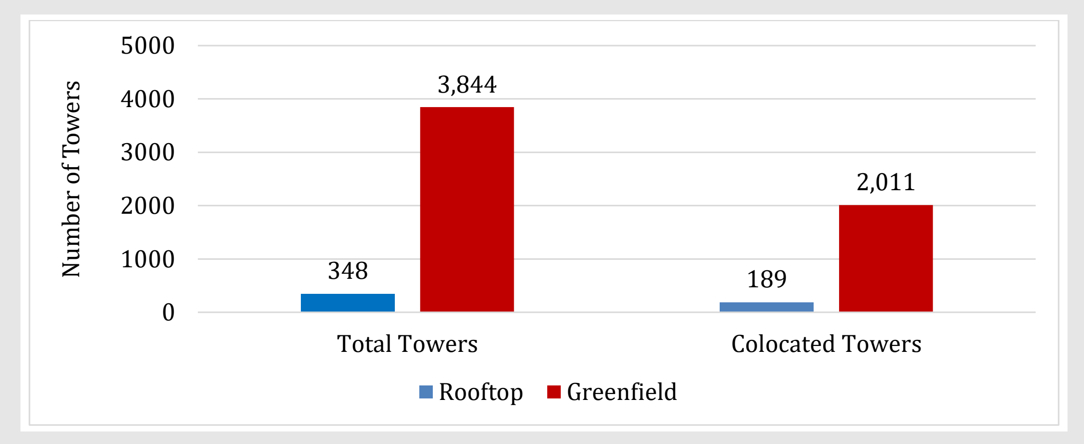
Tower Company		2013	2014	2015	2016	2017
Eaton Towers	Number of Towers	665	686	1,180	1,194	1,277
	Market Share (%)	*19.2*	*19.7*	*28.8*	*28.6*	*29.9*
American Towers	Number of Towers	2,065	2,057	2,172	2,224	2,216
	Market Share (%)	*59.6*	*59.2*	*52.9*	*53.2*	*51.9*
Helios Towers	Number of Towers	736	734	750	759	778
	Market Share (%)	*21.2*	*21.1*	*18.3*	*18.2*	*18.2*
Industry Total		3,466	3,477	4,102	4,177	4,271

Source: NCA; Tower Companies, 2017

Most of the towers in Ghana are Greenfield rather than Rooftop, and this is because of limited high rising buildings to accommodate these towers. As at the end of 2017, about 92 per cent of the towers in the industry were deployed at Greenfields (Figure 28).

[23] The infrastructure tower companies are communications entities that have been given the authorisation by NCA to build, erect, construct or otherwise acquire and own communication towers that are open to sharing by licensed network providers.

Figure 28: Number of Greenfield and Rooftop Towers in Ghana – 2017



Source: NCA; Tower Companies, 2017

6.3 Number of Towers and Tenancy Ratio on Towers in Ghana

The infrastructure tower industry in Ghana has expanded steadily over the past six years, with a compound annual growth rate (CAGR) of 4.32% (Table 26). In 2017, approximately 37 new towers were added and 255 new tenants.

Table 26: Yearly Total Number of Towers in the Industry

TOWER	2013	2014	2015	2016	2017	CAGR 2012 / 2017
Total number of greenfield towers	3,142	3,157	3,739	3,799	3,844	4.48%
Total number of rooftop towers	305	277	327	348	348	3.15%
Total number of towers	3,466	3,477	4,102	4,147	4,202	4.36%

Source: NCA, 2017

6.3.1 Tenancy Ratio on Towers in Ghana

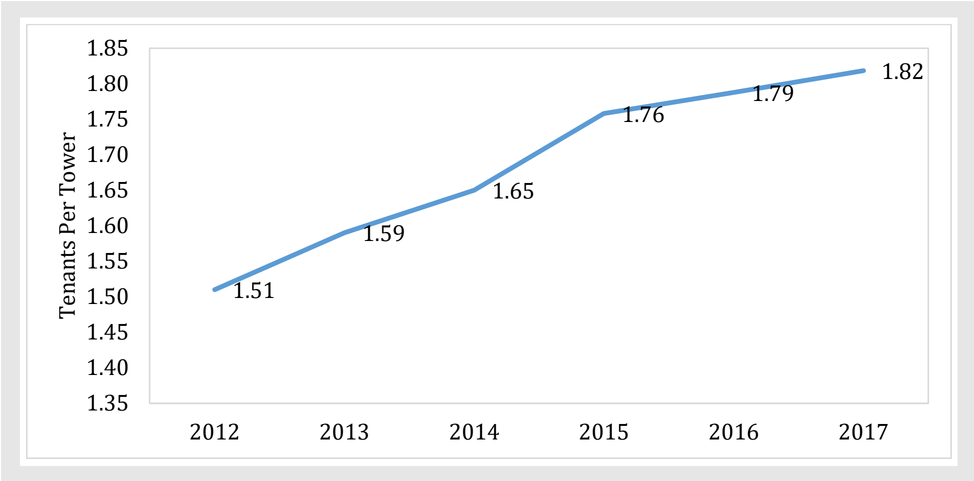
Tenancy ratio refers to the number of tenants, or operators, who have put up their antennae and other active infrastructure on the towers. Tower sharing has a huge potential to boost tenancy ratio i.e. the total number of tenants or occupants of a tower. Prior to the entrance of tower companies, the situation was one tower occupied by one tenant, and several towers clustered in one area creating aesthetic mess. The tenancy ratio of the telecom tower has since increased from 1.59 in 2013 to 1.82 in 2017 (Figure 29).

Table 27: Tenancy Ratio of Towers in Ghana

	2013	2014	2015	2016	2017
Total Number of Towers	3,466	3,477	4,102	4,177	4,271
Total Number of Tenants	5,524	5,752	7,212	7,467	7,765
Tenancy Ratio	1.59	1.65	1.76	1.79	1.82

Source: NCA, 2017

Figure 29: Tenancy Ratio of Towers in Ghana from 2012 - 2017

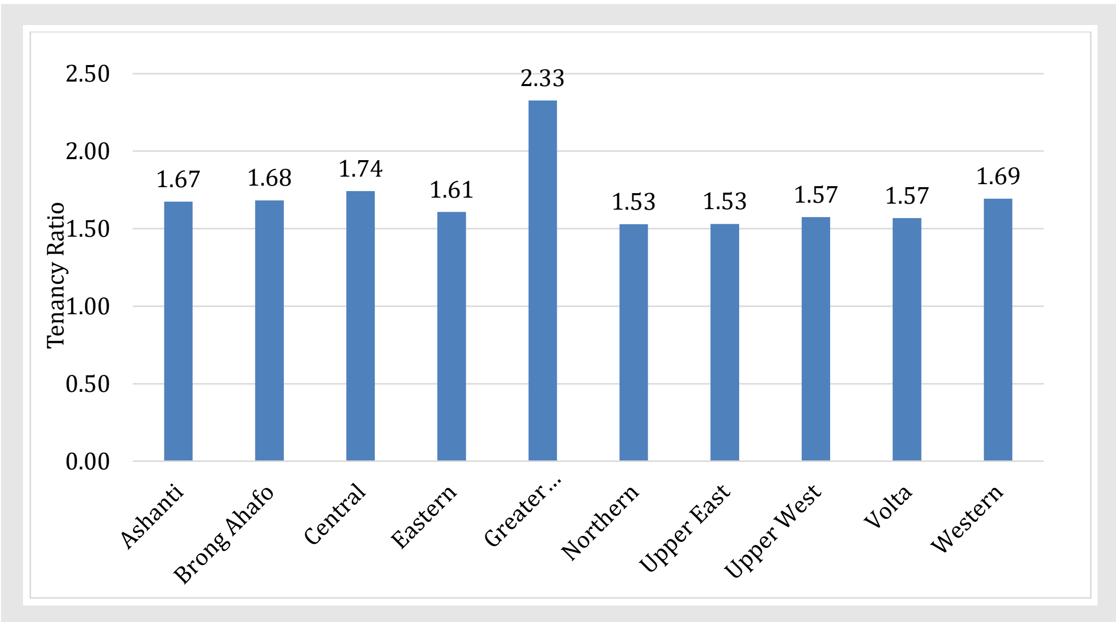


Source: NCA; Tower Companies, 2017

The regional distribution of towers based on tenancy ratio in 2017 was between 1.53 and 2.33 with a national average of 1.82. Greater Accra recorded the highest tenancy ratio of 2.33, which is higher than the national average of 1.82. The highest tenancy ratio of 2.33 recorded in Greater Accra Region is attributable to many reasons such as population and existence of many commercial activities within the Region (Figure 30)

Nine (9) regions out of ten (10), recorded tenancy ratio, lesser than the national average with Northern and Upper East regions accounting for the least ratio of 1.53 each.

Figure 30: Regional Distribution of Towers based on Tenancy ratio



Source: NCA; TowerCo,2017

APPENDICES

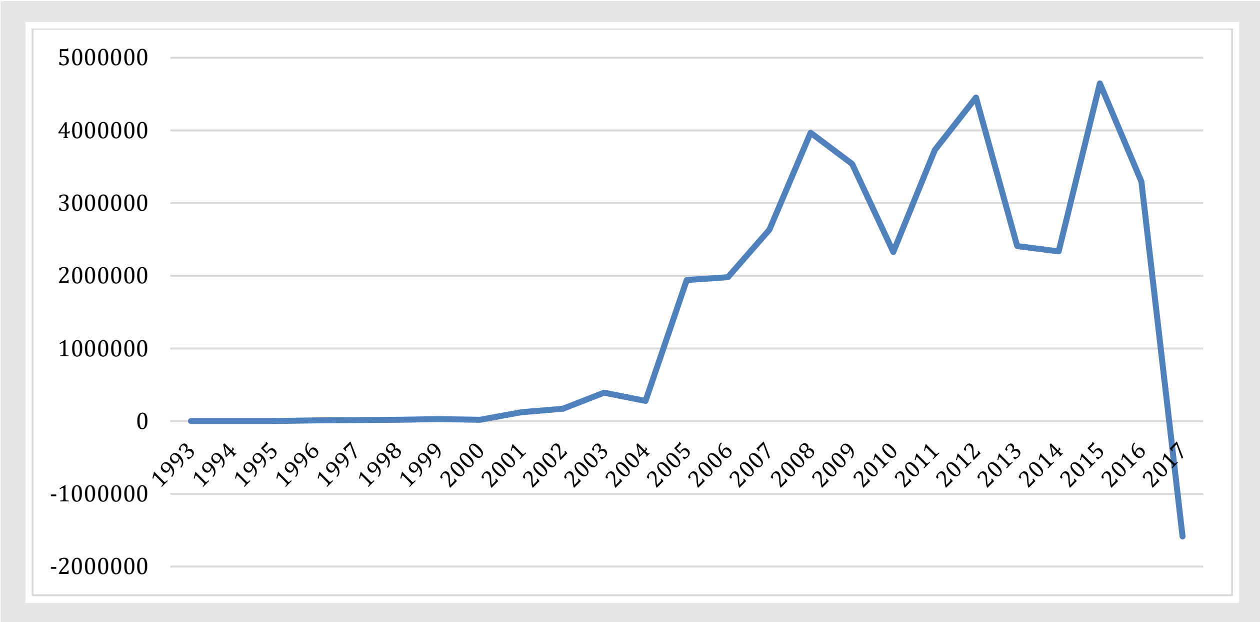
Appendix 1: Historical Frequency Modulation Radio Authorisations from 1985-2017

REGION	1985	1986	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
ASHANTI	0	0	2	3	6	9	11	12	12	12	25	29	31	33	34	34	34	35	35	35	41	47	50	53	63	65
BRONG AHAFO	0	0	0	0	2	3	5	8	11	12	17	18	19	20	22	23	24	28	29	32	43	45	52	57	67	74
CENTRAL	0	0	0	0	3	4	4	4	4	4	7	8	10	10	12	13	16	19	19	22	26	27	29	29	35	37
EASTERN	0	0	0	0	1	2	2	3	3	3	8	11	11	12	12	12	16	18	20	26	28	29	33	35	42	41
GREATER ACCRA	1	2	2	9	10	12	14	17	17	17	22	22	25	26	27	28	33	33	35	46	48	48	48	49	54	54
NORTHERN	0	0	0	0	7	7	7	7	7	7	10	11	11	12	12	12	13	18	18	22	28	30	39	40	48	54
UPPER EAST	1	1	1	1	2	2	2	2	2	2	3	3	3	3	4	4	5	8	8	8	10	11	13	16	18	22
UPPER WEST	0	0	0	0	1	1	1	1	1	3	3	4	4	4	4	5	5	5	5	7	9	14	14	17	22	22
VOLTA	0	0	0	0	4	4	4	4	4	4	6	6	6	6	6	6	10	13	15	21	29	34	39	45	52	56
WESTERN	0	0	5	6	6	8	8	8	8	9	18	18	21	21	23	24	28	29	30	36	48	52	64	72	81	86

Appendix 2: Historical mobile voice subscriptions from 1992 to 2017

Year	Tigo	Expresso	MTN	Vodafone	Airtel	Glo	Total	Growth (%)	Net Addition
1992	900	n/a	n/a	n/a	n/a	n/a	900	-	-
1993	1,700	n/a	n/a	n/a	n/a	n/a	1,700	88.89	800
1994	3,300	n/a	n/a	n/a	n/a	n/a	3,300	94.12	1,600
1995	3,600	2,500	n/a	n/a	n/a	n/a	6,100	84.85	2,800
1996	10,000	3,800	400	n/a	n/a	n/a	14,200	132.79	8,100
1997	16,853	5,000	6,100	n/a	n/a	n/a	27,953	96.85	13,753
1998	22,253	4,500	17,500	n/a	n/a	n/a	44,253	58.31	16,300
1999	32,806	3,220	34,000	n/a	n/a	n/a	70,026	58.24	25,773
2000	50,000	1,000	38,000	1,000	n/a	n/a	90,000	28.52	19,974
2001	35,000	7,000	150,000	20,000	n/a	n/a	212,000	135.56	122,000
2002	55,000	8,000	245,000	75,000	n/a	n/a	383,000	80.66	171,000
2003	150,000	38,000	510,000	77,000	n/a	n/a	775,000	102.35	392,000
2004	244,000	40,000	630,000	137,000	n/a	n/a	1,051,000	35.61	276,000
2005	600,000	90,000	1,750,000	550,000	n/a	n/a	2,990,000	184.49	1,939,000
2006	1,304,000	200,000	2,585,000	880,000	n/a	n/a	4,969,000	66.19	1,979,000
2007	2,023,091	289,066	4,016,132	1,275,764	n/a	n/a	7,604,053	53.03	2,635,053
2008	2,887,927	394,051	6,428,218	1,592,451	267,808	n/a	11,570,455	52.16	3,966,402
2009	3,420,354	262,259	8,000,946	2,132,119	1,293,238	n/a	15,108,916	30.58	3,538,461
2010	3,999,262	239,815	8,721,249	2,722,364	1,754,259	n/a	17,436,949	15.41	2,328,033
2011	3,921,754	186,751	10,156,112	4,275,521	2,625,705	n/a	21,165,843	21.39	3,728,894
2012	3,698,409	165,863	11,734,500	5,259,487	3,192,154	1,568,014	25,618,427	21.04	4,452,584
2013	4,021,225	133,663	12,929,528	6,048,792	3,395,263	1,498,011	28,026,482	9.4	2,408,055
2014	4,133,760	119,059	13,852,398	7,069,516	3,735,656	1,450,382	30,360,771	8.33	2,334,289
2015	4,850,034	125,263	16,254,984	7,612,059	4,796,645	1,369,402	35,008,387	*15.31*	*4,647,616*
2016	5,339,052	93,599	19,296,157	8,289,913	4,591,051	695,306	38,305,078	*9.4*	*3,296,691*
2017	5,217,875	23,264	17,832,546	9,028,161	3,986,163	627,752	36,715,761	*-4.15*	-1,589,317

Appendix 3: Mobile net additions from 1993 to 2017



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