

STATISTICS REPORT FOR TELECOM, MEDIA AND BROADCASTING SECTOR AS OF THE FOURTH QUARTER (OCTOBER-DECEMBER) OF THE YEAR 2022

Disclaimer: Information provided in this report is subject to alteration in case of any revision or update deemed necessary.

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REPORT SUMMARY

This report compiles the information from telecom operators, 4G wholesaler, Internet Service Providers (ISPs), Media and Broadcasting operators as per their license obligations for the period starting from 1st October to 31st December 2022.

Table 1: Key ICT indicators

INDICATORS	Q3 2022	Q4 2022	% change between Q3-22 and Q4-22
SUBSCRIPTIONS			
Mobile subscriptions	10,871,158	11,002,078	1.20
Fixed subscriptions	11,305	10,327	-8.65
Mobile (SIM) penetration rate (%)	82.49	83.06	0.68
Fixed telephone penetration rate (%)	0.086	0.078	-9.12
VOICE TRAFFIC IN MINUTES			
On-Net Voice Traffic	6,490,444,980	5,695,180,516	-12.25
Outgoing Off-Net Voice Traffic	1,636,543,118	1,182,716,011	-27.73
International Outgoing mobile voice traffic	6,852,038	9,489,809	38.50
International Incoming mobile voice traffic	24,593,555	25,004,862	1.67
ROAMING SUBSCRIBERS			
Roaming-in (Foreign subscribers)	1,605,480	987,759	-38.48
Roaming-Out (Own subscribers)	1,150,719	1,162,539	1.03
ROAMING TRAFFIC			
Total incoming minutes for roamers	75,206,339	88,475,915	17.64
Total outgoing minutes for roamers	2,773,447	2,777,589	0.15
SMS TRAFFIC			
On-net SMS	824,284,609	895,238,932	8.61
Outgoing Off-net SMS	57,277,332	93,040,571	62.44
Outgoing International SMS	1,094,313	1,068,306	-2.38
Incoming International SMS	1,895,007	1,534,277	-19.04
DATA/INTERNET			
Internet subscriptions	8,266,729	8,327,287	0.73
Internet subscriptions per 100 inhabitants	62.73	62.86	0.21
Equipped international internet bandwidth (Mbps)	178,032	187,954	5.57
Used international internet bandwidth (Mbps)	90,234	108,273	19.99
MEDIA AND BROADCASTING			
Number of Television stations	19	19	0.00
Number of Radio FM stations	29	29	0.00
Active Pay TV subscribers	85,486	124,496	45.63
Registered Pay TV subscribers	418,978	436,365	4.15

1. MOBILE TELEPHONE SERVICES

1.1. Mobile subscriptions

In the fourth quarter of the year 2022, the operators providing mobile telephone services were MTN Rwanda Ltd and Airtel Rwanda Ltd. The number of active mobile subscriptions reported at the end of December 2022 were 11,002,078 SIM cards. The Table 2 shows the comparison of active mobile subscriptions per operator.

Name of operator	December 2021		December 2022			Quarterly	
	Postpaid	Prepaid	Total	Postpaid	Prepaid	Total	Variation
MTN Rwanda Ltd	123,340	6,831,183	6,954,523	142,053	6,946,853	7,088,906	1.93%
Airtel Rwanda Ltd	4,910	3,943,556	3,948,466	7,395	3,905,777	3,913,172	-0.89%
Total	128,250	10,774,739	10,902,989	149,448	10,852,630	11,002,078	0.91%
Source: Operators' reports							

Table 2: Comparison of active¹ mobile subscriptions per operator by contract type

Source: Operators' reports

As of December 2022, the number of active mobile subscriptions in the country decreased to 11.00 million from 10.90 million active SIM cards reported at the end of December 2021. The active mobilecellular telephone (SIM cards) subscriptions per 100 people have also decreased from 84.16% for the end of December 2021 to 83.02% as of December 2022.

The Figure 1 displays the trends of active mobile subscriptions and penetration rates.

¹ Active mobile subscriptions refer to the number of SIM cards which generated revenues to the operator within 90 days.

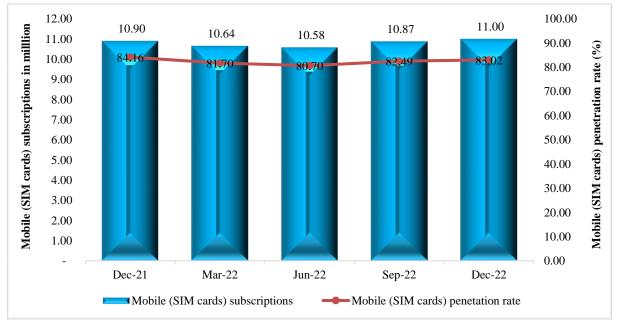


Figure 1: Trend of mobile subscriptions and penetration rate² from Q4 2021 to Q4 2022

Source: Operators' reports

1.2. Market share for mobile (SIM cards) subscriptions

At the end of December 2022, the market shares in terms of active SIM cards for MTN Rwanda Ltd increased by 0.6 percentage points up to 64.4% whereas that for Airtel Rwanda Ltd dropped by the same margin reaching 35.6% in comparison to December 2021 publications.

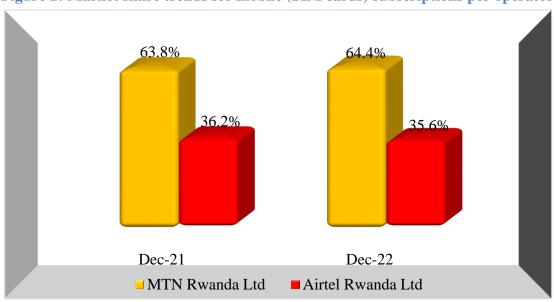


Figure 2: Market share trends for mobile (SIM cards) subscriptions per operator

 $^{^{2}}$ Mobile (SIM cards) penetration rate (%) is computed with reference to the sum of active SIM cards over the Rwandan population published by National Institute of Statistics of Rwanda.

1.3. Mobile Voice, and SMS tariff structure

During the quarter under review, the average standard tariff for calling by mobile phone within a telecom operator was 40 Frw/Min while also 40 Frw/Min was between telecom operators, 90 Frw/Min in One Area Network Countries, and 51 Frw/Min to call in US, Canada, China, and India.

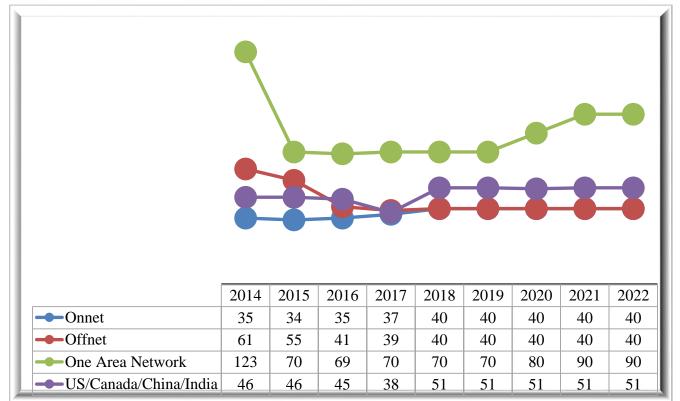
Destination	MTN Rwanda Ltd	Airtel Rwanda Ltd	Average
Onnet	45	35	40
Offnet	45	35	40
One Area Network	90	90	90
US/Canada/China/India	51	51	51

Table 3: Mobile telephone voice tariff (in Frw) per minute per operator as of December 2022

Source: Operators' reports

In the fourth quarter 2022, the standard average tariff for calling by mobile telephone within a telecom operator, between telecom operators, and to call in US, Canada, China, and India was 40 Frw/Min, 40 Frw/Min, and 51 Frw/Min respectively. The standard average voice tariff for calling in One Area Network Countries was 90 Frw/min.





In the fourth quarter 2022, the average tariff for sending a message within a telecom operator, between telecom operators, in ONA countries, and international was 8.5 Frw, 20.5 Frw, 42.5 Frw, and 79.5 respectively. A subscriber on Airtel Rwanda's network can send a short text message to its Africa sister companies 'subscribers at 26 Frw.

SMS Tariff	MTN Rwanda Ltd	Airtel Rwanda Ltd	Average
Onnet tariff	12	5	8.5
Offnet tariff	26	15	20.5
ONA	45	40	42.5
Rest of the World	80	79	79.5

Source: Operators' reports

1.4. Mobile traffic statistics

1.4.1. Mobile outgoing and incoming international voice traffic

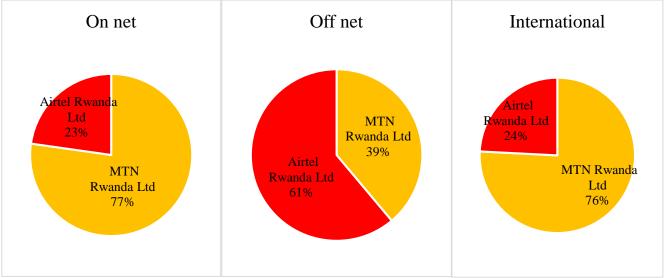
In the fourth quarter of 2022, the total volume of minutes originating within mobile networks were 5.6 billion minutes, the total minutes originating from mobile networks to other domestic networks were 1.1 billion minutes, and the total minutes from mobile networks to international networks were 9.4 million minutes. The number of minutes from international networks to local mobile networks were 25.0 million minutes.

Table 5: Outgoing and incoming traffic per operator as of the 4 th quart	er 2022
-------------------------------------------------------------------------------------	---------

Voice traffic	MTN Rwanda Ltd	Airtel Rwanda Ltd	Total		
	Outgoing	, minutes			
On net	4,399,047,390	1,296,132,261	5,695,179,651		
Off net	459,774,882	722,654,870	1,182,429,752		
International	7,183,894	2,292,319	9,476,213		
Incoming minutes					
International	10,015,364	14,989,008	25,004,372		

1.4.2. Market shares for mobile outgoing voice traffic

In the 4th quarter 2022, the 77% of the total on net minutes generated by mobile networks were from MTN Rwanda Ltd and 23% from Airtel Rwanda Ltd. The off-net minutes 'market shares for MTN Rwanda Ltd and Airtel Rwanda Ltd were 39% and 61% respectively. The 76% of minutes from local mobile networks to international networks were generated by MTN Rwanda Ltd whereas the remaining 24% were for Airtel Rwanda Ltd.





1.4.3. Average calling time (Minutes/call)

During the fourth quarter 2022, the average minutes per call within mobile telecom networks were 2.2, average minutes per call to call other domestic networks were 1.3 while the average minutes per call from Rwanda mobile networks to international networks were 2.5. The average minutes per call from international networks to Rwanda mobile networks were 2.9.

Table 6: Average minutes per call per operator in the 4 th quarter 2022						
Voice traffic	MTN Rwanda Ltd	Airtel Rwanda Ltd	Combined			
	Average outgoing minutes per call					
On net	2.2	2.3	2.2			
Off net	1.9	1.1	1.3			
International	2.7	2.2	2.5			
Average incoming minutes per call						
International	2.0	4.4	2.9			

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Source: Operators' reports

1.4.4. Outgoing and incoming international SMS traffic

In the fourth quarter 2022, the total volume of SMS traffic originating within mobile networks were 895.2 million SMS, the total SMS traffic originating from mobile networks to other mobile networks were 93.0 million SMS and the total SMS traffic from mobile networks to international networks were 1.0 million SMS. The number of SMS from international networks to Rwanda were 1.5 million SMS.

Table 7: SNIS traffic (in numbers) as of the fourth quarter 2022						
Destination	MTN Rwanda Ltd	Airtel Rwanda Ltd	Total			
Outgoing SMS						
On net	817,002,761	78,236,171	895,238,932			
Off net	28,496,421	64,544,150	93,040,571			
International	979,750	88,556	1,068,306			
Incoming SMS						
International	540,823	993,454	1,534,277			

 Table 7: SMS traffic (in numbers) as of the fourth quarter 2022

Source: Operators' reports

1.4.5. Market shares for outgoing on net, off net and international SMS traffic

In the 4th quarter 2022, the 91% of the total on net SMS were for MTN Rwanda Ltd and 9% of Airtel Rwanda Ltd. The 69% of off net SMS were for Airtel Rwanda Ltd and the 31% of MTN Rwanda Ltd. The 92% and 8% of SMS from local mobile networks to international networks are generated by MTN Rwanda Ltd and Airtel Rwanda Ltd respectively.

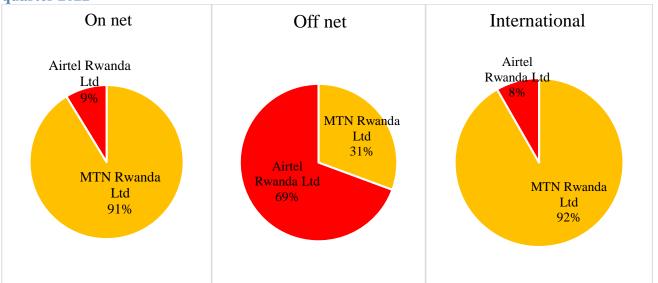


Figure 5: Outgoing on net, off net and international SMS traffic market share as of the fourth quarter 2022

2. ROAMING

2.1. Roaming subscribers

The international roaming subscribers recorded in the 4th quarter of the year 2022 stood at 0.9 million foreign subscribers roamed on local networks whereas 1.1 million Rwanda subscribers roamed on foreign networks.

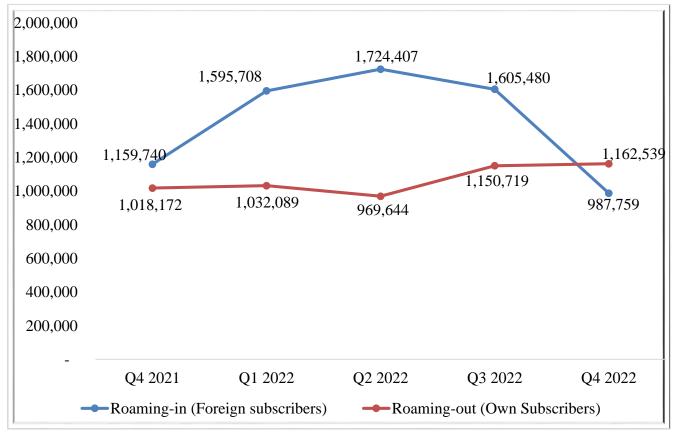
Table 8: International roaming subscribers as of the 4th quarter 2022

Destination	MTN Rwanda Ltd	Airtel Rwanda Ltd	Total				
Roaming-in (Foreign subscribers)	774,217	213,542	987,759				
Roaming-out (Own Subscribers)	848,336	314,203	1,162,539				
Source: Operators' reports							

Source: Operators' reports

During the 4th quarter 2022, the number of roamers-out increased to 1,162,539 from 1,150,719 subscribers representing an increase of 1.0% whereas the number of roamers-in decreased up to 987,759 from 1,605,480 subscribers in compared to the previous quarter, which is equivalent to 38.5%.





2.2. Roaming traffic

In the fourth quarter 2022, the total volume of outgoing traffic generated by foreign subscribers roaming in Rwanda was 1.4 million minutes and the total minutes generated by Rwanda mobile networks 'subscribers roamed outside the country was 1.3 million minutes. On the other hand, the total incoming traffic on foreign subscribers roamed in Rwanda was 19.7 million minutes whereas the incoming minutes to Rwanda subscribers roamed on foreign networks was 68.6 million.

Destination Foreign subscribers roaming on local Own subscribers roaming on foreign networks networks MTN Airtel Total MTN Airtel Total 3,081,951 16,697,039 19,778,990 67,515,513 1,181,412 68,696,925 Incoming Outgoing 909.862 519.333 1,429,195 1,348,394 1,239,953 108,441 Total 3,991,812 17,216,372 21,208,185 68,755,467 1,289,853 70,045,320

Table 9: Outgoing and incoming roaming traffic (in minutes) as of the fourth quarter 2022

Source: Operators' reports

3. FIXED TELEPHONE SERVICES

3.1. Fixed telephone subscriptions

In the fourth quarter 2022, the operators offering fixed telephone services were Liquid Telecom Ltd, MTN Rwanda Ltd, Airtel Rwanda Ltd and BSC Ltd that offers voice-over-IP (VoIP) subscriptions only.

Table 10: Fixed telephone subscriptions as of December 2022

Name of Operator	Fixed telephone subscriptions	Fixed telephone penetration rate $(\%)^3$
MTN Rwanda Ltd	163	
Airtel Rwanda Ltd	8,113	
Liquid Telecom Ltd	790	0.0780
BSC Ltd	1,261	
Total	10,327	

Source: Operators' reports

As of December 2022, the number of fixed telephone subscriptions have decreased to 10,327 from 11,893 recorded at the end of December 2021. The fixed telephone subscriptions per 100 people have also decreased up to 0.0780% from 0.0918% as of December 2021.

³ Fixed telephone penetration rate (%) is computed with reference to the sum of active numbers of analogue-fixed telephone lines and VoIP over the Rwandan population as projected by National Institute of Statistics of Rwanda.

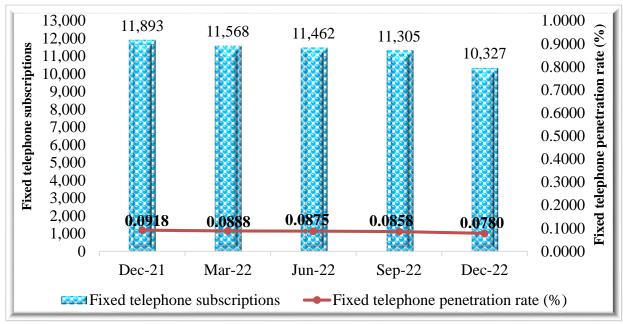


Figure 7: Trend of fixed telephone subscriptions and penetration rate

Source: Operators' reports

As of December 2022, the market shares in fixed telephone subscriptions for Airtel Rwanda Ltd decreased by 1.5 percentage points to 78.6%, and that for BSC Ltd increased by 1.6 percentage points to 12.2%. The market shares for Liquid Telecom Ltd decreased by 0.2 percentage points to 7.6% and that for MTN Rwanda Ltd have increased up to 1.6% in comparison to the publications of the 4th quarter of 2021.

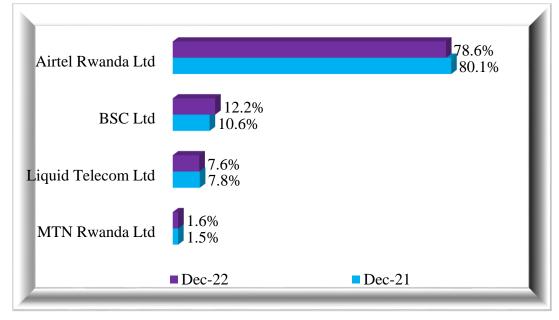


Figure 8: Market share trends for fixed telephone subscriptions per operator as of Dec-2022

3.2. Fixed telephone traffic

In the 4th quarter 2022, the total volume of minutes originating within operators by fixed telephone lines were 1.2 million minutes, the total minutes originating from one operator to other operators were 0.3 million minutes, and the total minutes from Rwanda fixed telephone lines to international networks were 24,529 minutes. The number of minutes from international networks to local fixed telephone lines were 11,548 minutes.

Voice traffic	MTN Rwanda Ltd	Airtel Rwanda Ltd	Liquid Telecom Ltd	Total		
Outgoing minutes						
On net	1,189,650	23,396	865	1,213,911		
Off net	42,728	22,966	286,259	351,953		
International	10,616	317	13,596	24,529		
Incoming minutes						
International	10,966	582	490	11,548		

Table 11: Outgoing mobile and fixed telephone incoming traffic as of 4th quarter 2022

Source: Operators' reports

3.3. Fixed telephone service tariff

In the fourth quarter 2022, the average tariff for calling by fixed telephone within telecom operator was 30 Frw, while calling across telecom operators was 36.7 Frw, and 196.1 Frw to call in One Area Network Countries.

Table 12: Fixed telephone service tariff structure (in Frw) per minute as of December 2022

Destination	Liquid Telecom Ltd	MTN Rwanda Ltd	Airtel Rwanda Ltd	Average
On net	10	45	35	30
Off net	30	45	35	36.7
One Area Network	408.28	90	90	196.1

4. INTERNET SERVICE PROVISION

4.1. Internet subscriptions⁴

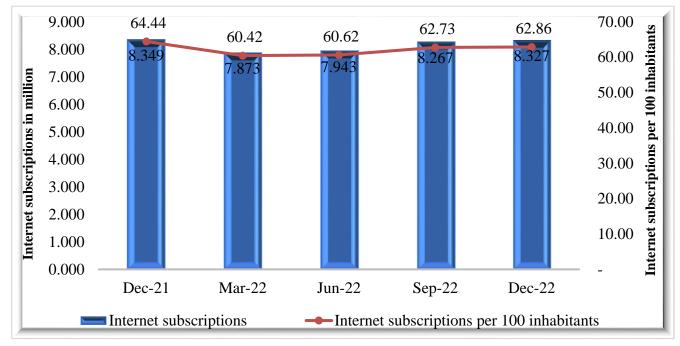
There were 8,279,430 active SIM cards connected to the internet within the last 90 days and 47,857 active fixed internet subscriptions recorded at the end of 4th quarter of year 2022. The table below shows the internet subscriptions per operator per technology.

Nome of an anotary	Fixed internet subscriptions		Mobile inte	Total internet		
Name of operators	Narrowband (≤256kbps)	Broadband (≥256kbps)	GPRS&EDGE	3G	4G	subscriptions
MTN Rwanda Ltd	85	7,667	3,553,044	1,709,863	210,604	5,481,263
Airtel Rwanda Ltd		1,347	1,802,054	889,233	17,655	2,710,289
Axiom Networks Ltd		132				132
4NetAfrica Ltd		2			89	91
BSC Ltd		3,329			17,258	20,587
Liquid Telecom Ltd		14,521				14,521
CBNET Ltd		17			625	642
G-MAX Ltd		5			1,034	1,039
ISCO ISP Ltd		20			479	499
NET LINK Ltd		4			705	709
Piramie INC		1			722	723
Simba Supermarket					138	138
KOPA Telecom		51			6,056	6,107
BK Techouse		138			709	847
FASTNET		10			2,972	2,982
Mango Telecom Ltd		25			61,472	61,497
RTN Ltd					1,822	1,822
Smart Broadband Ltd		1			964	965
TNSP		16			603	619
NETPRO Ltd					1,329	1,329
GVA Rwanda		20,486				20,486
Total subscriptions	85	47,772	5,355,098	2,599,096	325,236	8,327,287
Subscriptions per	0.00	0.36	40.43	19.62	2.46	62.86
100 inhabitants						

Table 13: Internet subscriptions per category as of December 2022

⁴ Internet subscriptions combine the number of active SIM cards (mobile internet) connected to the internet at least once within 90 days and active fixed internet subscriptions.

At the 4th quarter 2022, the total number of internet subscriptions dropped by 0.3% to reach 8.327 million from 8.349 million for the end of December 2021 whereas there was an increase of 0.7% compared to Q3 2022 publications. The internet subscriptions per 100 inhabitants for December 2022 increased by 0.13 percentage points up to 62.86% compared to September 2022.





As of December 2022, the fixed internet subscriptions increased by 49.6% in comparison to the 4th quarter 2021 publications. The 99.8% of total fixed internet subscriptions were subscribed to the speed greater or equal to 256 kbps whereas the 0.2% was below 256 kbps.

Table 14: Fixed internet subscriptions by speed

Speed	Fixed internet subscriptions					
	December 2021	December 2022				
< 256 kbps	87	85				
[256 kbps-2Mbps [1,618	1,604				
[2 Mbps -10 Mbps [4,367	4,772				
[10 Mbps-30Mbps [21,871	33,660				
[30 Mbps < 100Mbps [3,798	6,954				
≥ 100 Mbps	248	782				
Total	31,989	47,857				

Source: Operators' reports

⁵ Internet subscriptions per 100 inhabitants: This rate is the total internet subscriptions over the Rwandan population as projected by National Institute of Statistics of Rwanda.

During the fourth quarter 2022, the highest number of fixed internet subscriptions was connected to the fiber-to-the home/building, whereas the lowest fixed internet subscriptions are on satellite and DSL technology as shown in the below figure.

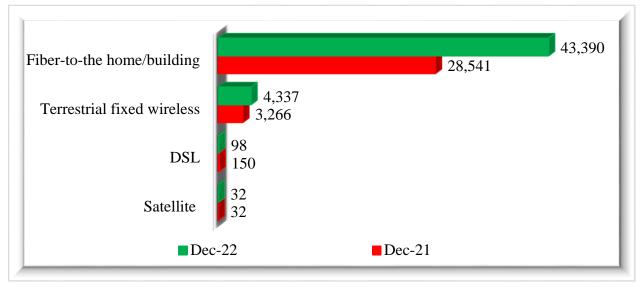


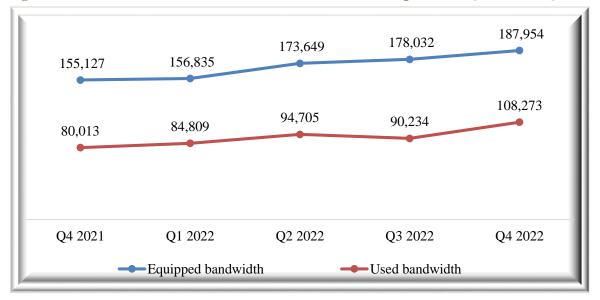
Figure 10: Fixed internet subscriptions by technology

Source: Operators' reports

4.2. International internet bandwidth

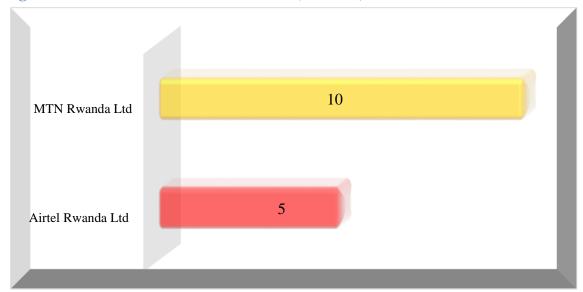
During the 4th quarter 2022, the total equipped international internet bandwidth available in the country was 187,954 Mbps whereas the average used internet bandwidth was 108,273 Mbps.

Figure 11: Trend of international internet bandwidth (Mbps) from Q4 2021 to Q4 2022



4.3. Mobile internet tariff

In the 4th quarter 2022, the standard tariff for mobile internet per MB was at 10 Frw on MTN Rwanda Ltd and 5 Frw on Airtel Rwanda Ltd network.





Source: Operators' reports

5. EMPLOYMENT IN TELECOMMUNICATION SECTOR

One thousand one hundred ninety-three (1,193) persons were employed in telecommunication sector at the end of December 2022; one thousand ninety-four (1,094) are permanent staff whereas ninety-nine (99) are temporary staff. There were also seven hundred seventy-six (776) outsourced staff employed by telecommunication sector. The table below illustrates the number of employed persons by operator.

Operator	Тур	e of contract		Gend	ler	Domest		Outsour
				F 1	20.1	foreign en		ced staff
	Temporary	Permanent	Total	Female	Male	Domestic	Foreign	
MTN Rwanda Ltd	6	332	338	115	223	332	6	489
Airtel Rwanda Ltd	0	117	117	14	103	114	3	196
Liquid Telecom Ltd	62	61	123	26	97	119	4	0
G-MAX	0	9	9	3	6	9	0	0
KOPA Telecom	1	18	19	5	14	19	0	0
Axiom Networks Ltd	0	26	26	8	18	24	2	0
4NetAfrica Ltd	0	1	1	0	1	1	0	0
TNSP	10	5	15	5	10	15	0	2
KTRN Ltd	3	107	110	21	89	107	3	0
Piramie INC	0	6	6	3	3	4	2	2
BSC Ltd	4	75	79	20	59	79	0	0
BCS Ltd	0	1	1	0	1	1	0	0
AC Group Ltd	0	38	38	10	28	38	0	0
FASTNET	1	9	10	3	7	10	0	2
ISCO ISP Ltd	0	2	2	1	1	2	0	0
SIMBA Supermarket	0	3	3	0	3	3	0	0
BK Techouse	6	43	49	9	40	48	1	0
Mango Telecom Ltd	0	139	139	72	67	138	1	0
NET LINK LTD	0	10	10	3	7	9	1	0
CBNET Ltd	2	1	3	1	2	3	0	0
RTN	0	19	19	6	13	19	0	0
Smart Broadband Ltd	0	4	4	0	4	4	0	0
NETPRO LTD	0	5	5	3	2	5	0	0
GVA Rwanda	4	63	67	17	50	65	2	85
Total	99	1,094	1,193	345	848	1,168	25	776

Table 15: Number of staff employed in telecommunication sectors as of December 2022

Source: Operators' reports

The three hundred forty-five (345) staff representing 29% of the total staff are female whereas 71% are male as shown in the figure below. The four hundred and three persons (388) representing 50% per cent of the total outsourced staff are female.

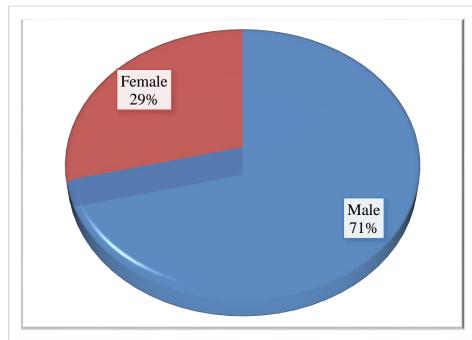


Figure 13: Telecom staff by gender as of December 2022

6. MEDIA AND BROADCASTING

The table below shows the cumulative number of licensed Television Stations, FM Radio Broadcasters, Online Media Houses, Pay TV operators, print media houses, International media houses, and Signal Distributors up to the end of December of the year 2022.

6.1. Licensed media operators

In the fourth quarter of 2022, there was one (1) licensed signal distributors, four (4) pay TV operators, twenty-nine (29) FM radio stations, nineteen (19) television stations, fourteen (14) online media houses, nine (9) print media houses, and two (2) international media houses.

Category	Dec-2021	Mar-2022	June-22	Sep-2022	Dec-2022
Signal distributors	1	1	1	1	1
Pay TV operators	4	4	4	4	4
FM Radio stations	31	30	30	29	29
Television stations	19	21	21	19	19
Online media houses	24	14	14	14	14
Print media houses	32	8	9	9	9
International media houses	3	2	2	2	2

Source: RURA database

6.2. Pay TV subscriptions

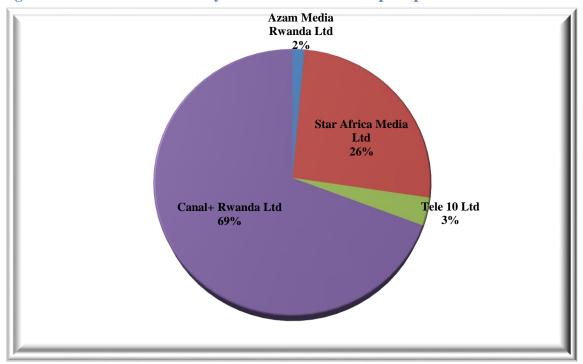
Registered Pay TV subscribers at the end of the fourth quarter 2022 were 436,365 whereas active subscribers were 124,496.

Table 17: Number of Pay TV subscribers as of December 2022

Name of Pay TV	Registered subscribers	Active ⁶ subscribers
Azam Media Rwanda Ltd	14,624	1,818
Star Africa Media Ltd	270,575	32,272
Tele 10 Ltd	4,332	4,231
Canal+ Rwanda Ltd	146,834	86,175
Total	436,365	124,496

⁶ Active subscribers are the customers that generated revenues to the Pay TV operators during the reporting period.

As of December 2022, the market shares for Canal+ Rwanda Ltd in active Pay TV subscriptions was 69%, 26% for Star Africa Media Ltd, 3% for Tele 10 Ltd, and 2% for Azam Media Rwanda Ltd.





Source: Operators' reports

6.3. Decoders sold

During the fourth quarter of the year 2022, the number of decoders sold by Pay TV operators have increased to thirty-three thousand three hundred forty-eight (33,348) from fifteen thousand one hundred twenty-two (15,122) recorded in the previous quarter.

Table 18: Trend of	f decoders sold	from 4 th quarter	2021 to 4 th	quarter of 2022
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Number of Decoders Sold	Q4 2021	Q1 2022	Q2 2022	Q3 2022	Q4 2022
Azam Media Rwanda Ltd	11	0	58	55	63
Star Africa Media Ltd	5,419	5,240	6,471	3,925	5,339
Tele 10 Ltd	262	240	319	311	1,914
Canal+ Rwanda Ltd	17,657	11,751	12,328	10,831	26,032
Total	23,349	17,231	19,176	15,122	33,348

6.4. Pay TV staff

The total number of staff employed by Pay TV operators as of December 2022 was one hundred fiftyeight (158) of which 51.3% are employed by Star Africa Media Ltd, 36.1% by Canal+ Rwanda Ltd, 9.5% by Tele 10 Ltd, and 3.2% are employed by Azam Media Rwanda Ltd. The fifty-five (55) staff representing 34.8% of the total staff are female.

Table 19: Number of staff employed by Pay TV operators as of December 2022

Operator	Staff per type of contract			Staff per gender		Domestic and foreign employees	
	Temporary	Permanent	Total	Female	Male	Domestic	Foreign
Azam Media Rwanda Ltd	0	5	5	2	3	4	1
Star Africa Media Ltd	0	81	81	20	61	74	7
Tele 10 Ltd	0	15	15	6	9	15	0
Canal+ Rwanda Ltd	8	49	57	27	30	49	8
Total	8	150	158	55	103	142	16