COMMUNICATIONS
REGULATION
COMMISSION

COMMUNICATIONS REGULATION COMMISSION

A N N U A L R E P O R T
2018

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INTRODUCTION

The electronic communications sector is continuously changing under the influence of new technologies, competition, restructuring and globalisation. In this dynamic environment, regulation also evolves to meet the new challenges and raised expectations of all market players - both undertakings and users. Over the past year, as a direct participant in these processes, the Communications Regulation Commission (CRC, the Commission) stayed true to its mission - to work for the establishment of an effective competition, for higher investments in the sector, for the development of new technologies and for the protection of users in Bulgaria.

Undoubtedly, 2018 was a very important year for the European electronic communications sector. At the end of the year, the new European Electronic Communications Code harmonising the regulatory requirements of the related digital single market was finally adopted.

Over the past year, CRC worked actively for the fulfilment of its main priorities, among which is to ensure conditions for the entry of new technologies and services to the market through effective distribution and provision of the scarce resource - radio frequency spectrum (RFS), including a spectrum for the building of wireless broadband networks, and to make available to all citizens a broadband access of the highest possible speed and capacity. While conducting an active and transparent dialogue with stakeholders, CRC run public consultations to explore the interest in the perspectives for the use of the available free spectrum in the 2.6 GHz band and for the provision of the free resource in radio frequency bands 2 GHz and 2.6 GHz. In order to meet the growing need for next-generation (4/5 G) broadband network transmission, the regulator also analysed the opportunity to provide frequency resource in the 26 GHz band.

Taking into account the interest of the business and in order to encourage competition and innovations, the Commission adopted a draft amendment and supplement to the Tariff of fees collected by CRC under the Law on Electronic Communications (LEC). The regional principle of determining the fees in 3.6 GHz and 26 GHz bands was removed and the amount of the one-off and of the annual fee in the 2.6 GHz band was decreased.

With the amendment and supplement to the regulations concerning the radio frequency spectrum, the provisions of new decisions of the European Commission (EC/the Commission) and of the Electronic Communications Committee (ECC) on the harmonised use of radio frequency spectrum were transposed into the Bulgarian legislation.

With a view to ensure conditions for effective and harmonised use of radio frequency band 700 MHz, the so called "second digital dividend", CRC participated actively in the elaboration of a National Roadmap including detailed steps towards fulfilment of Bulgaria's obligations under Decision (EU) 2017/899 of the European Parliament and of the Council of 17 May 2017. In line with the tasks set under the National Roadmap adopted by Decision No 887/06.12.2018 of the Council of Ministers, the Commission took the necessary actions to free the 700 MHz band (radio frequency band 694-790 MHz) for digital television and to coordinate the allotments of the new digital terrestrial television which were successfully coordinated.

The Commission encourages the development of the market for electronic communications networks and services by applying regulatory measures to limit the possibilities for restriction of competition. In this regard, in 2018 was launched the third round of the procedure for determination, analysis and assessment of the market of wholesale local access provided at a fixed location (Market 3a) in compliance with the market list to Commission Recommendation of 9 October 2014 on the relevant product and service markets within the electronic communications sector susceptible to *ex ante* regulation.

In March 2018, the Law on Electronic Communications Networks and Physical Infrastructure (LECNPI) entered into effect, assigning new powers to the Communications Regulation Commission as a dispute resolution body. Thus, the laws applied by CRC have already become four - the Law on Electronic Communications (LEC), the Postal Services Act (PPA), the Law on Electronic Document and Electronic Trust Services (LEDETS), and the Law on Electronic Communications Networks and Physical Infrastructure (LECPNI).

This annual report was prepared by the Communications Regulation Commission pursuant to Art. 38 of the LEC. It presents an overview of the work performed by CRC in 2018 and outlines the main directions in its forthcoming activity.

I. STATE, DEVELOPMENT AND PROSPECTS OF THE ELECTRONIC COMMUNICATIONS MARKET

1. Volume and structure of the Bulgarian electronic communications market

1.1. Market volume

According to data from the CRC register, as of 31.12.2018, a total of 1,120 undertakings were registered at CRC with the intention to provide public electronic communications. In implementation of Art. 5 of the General Requirements[1] and Decision No 49 of 24.01.2019 of CRC, a total of 1,010[2] of the undertakings registered as of 31.12.2018 have submitted to the Commission an annual activity report for 2018 (the share of undertakings having submitted reports makes up 90.2% of those registered as of the said date).

In 2018, 849 undertakings performed their activity, including 18 undertakings which suspended their activity on providing public electronic communications during the year and submitted a report pursuant to Art. 5a of the General Requirements (as of 31.12.2018, those undertakings were removed from the CRC register). In comparison to the previous reporting period (2017), an increase was observed in 2018 both in the number of undertakings registered at CRC for the provision of public electronic communications (by 1.5%) and in the number of undertakings actually carrying out activity during the year (increase by 0.8%).

In 2018, the total volume of the Bulgarian electronic communications market amounted to BGN 2.577 billion[3], with a considerable increase reported for the first year following a continuous downward period - by 5.5% as compared to the 2017 data.[4]

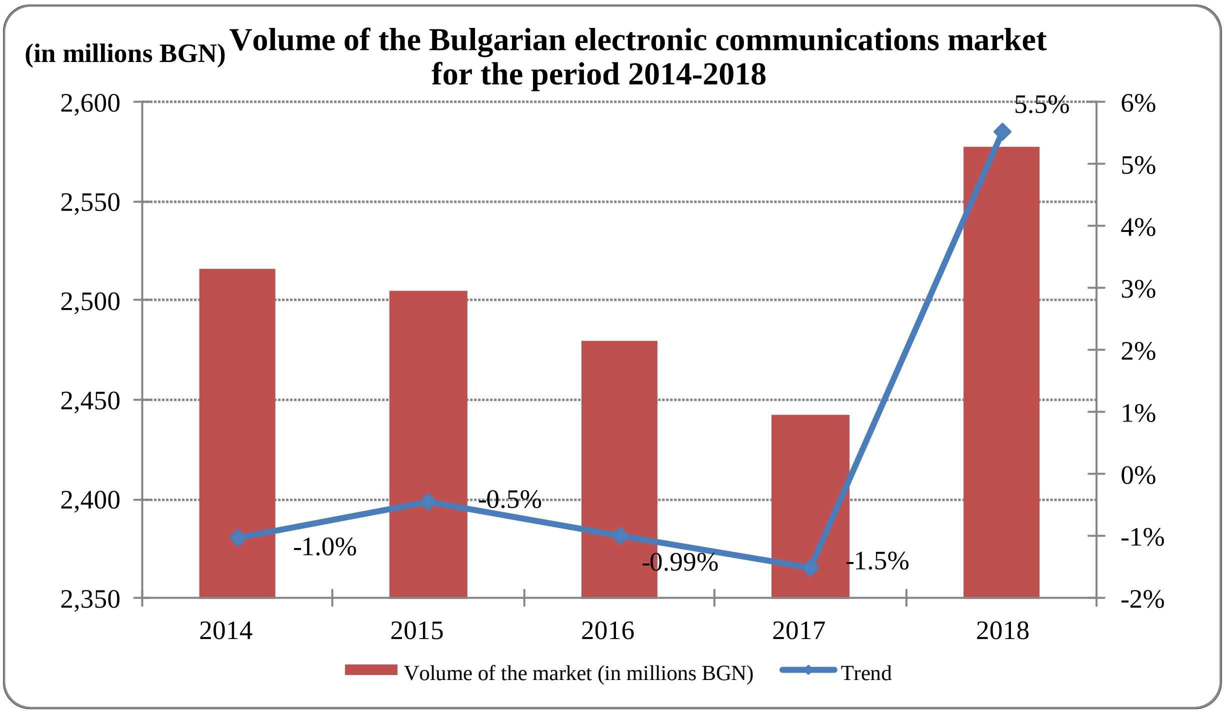
Figure 1 presents the dynamics in the volume of electronic communications market in the country for the period 2014-2018.

[1] General requirements for the provision of public electronic communications (prom. SG, no. 24 of 4 March 2008, amended SG, no. 102 of 28 November 2008, amended SG, no. 63 of 7 August 2009, amended SG, no. 19 of 8 March 2011, amended SG, no. 105 of 29 December 2011, amended and suppl. SG, no. 63 of 17 August 2012, amended and suppl. SG, no. 4 of 14 January 2014, amended and suppl. SG, no. 54 of 15 July 2016, amended and suppl. SG, no. 90 of 10 November 2017, amended and suppl. SG, no. 90 of 30 October 2018, amended SG, no. 10 of 1 February 2019).

[2] The data is based on the information submitted to CRC as of 17.05.2019.

[3] Including revenues from undertakings that suspended their activity in 2018.

[4] The data for 2017 have been updated.



Note: *The data for 2017 have been updated.*

Source: Data submitted to CRC

Figure 1

The share of the total volume of the public electronic communications market constituted 2.4% of the total GDP[5] of Bulgaria for 2018. Notwithstanding the growth in the total volume of the public electronic communications market, a decrease of 0.1 percentage points was observed in its share of the total GDP versus 2017, when it amounted to 2.5%. The said decrease is due to the greater increase of Bulgaria's GDP as compared to the growth in the electronic communications market volume.

1.2. Market structure

Information on revenue from the provision of public electronic communications in Bulgaria by segments, determined according to the type of services, is provided in Table 1.

In the present year, considering the significant impact of bundled services on the total market volume and on the separate segments, revenue information was restructured by segments. To this end, revenue from bundled services[6] which were reported in the Annual Reports from 2010 through 2017 as a separate segment ("Bundled services"), are in the present Annual Report distributed[7] in "Voice services", "Data transfer and Internet access" and

[5] Calculated at current prices. Source: NSI: http://www.nsi.bg/bg/content/2206/%D0%B1%D0%B2%D0%BF-%D0%BF%D1%80%D0%BE%D0%B8%D0%B7%D0%B2%D0%BE%D0%B4%D1%81%D1%82%D0%B2%D0%B5%D0%BD-%D0%BC%D0%B5%D1%82%D0%BE%D0%B4-%D0%BD%D0%B0%D1%86%D0%B8%D0%BE%D0%BD%D0%B0%D0%BB%D0%BD%D0%BE-%D0%BD%D0%B8%D0%B2%D0%BE

[6] Installation fees and monthly subscription fees from the provision of two or more of the following services: fixed Internet access, fixed telephony service, mobile telephony service, mobile Internet access or pay TV;

[7] The breakdown of revenue from bundled services (installation fees and monthly subscription fees for fixed and mobile telephony services, Internet access and television) by types of services included in the bundle is made and presented in the Annual questionnaires by the undertakings which have submitted the information. The breakdown was made based on evaluation of the prices of standalone services having close or similar characteristics (e.g.:

"Transmission and/or distribution of radio and TV programmes services" segments, while the "Bundled services" segment was removed. The above restructuring was made with the purpose of presenting information on the total amount of revenue from the provision of the main services as a whole, regardless of whether they are used as standalone services or in a bundle.

To achieve data comparability, Table 1 presents the relevant re-calculations for 2016 and 2017, as the revenue part of the "Bundled services" segment has been added to each segment in accordance with the 2016 and 2017 Annual Reports.

Table 1

Structure of the public electronic communications market in Bulgaria according to the type of services provided for the period 2016 – 2018

Public electronic communications services	**Revenues**		
	2016	**2017** [1]	**2018**
	(in millions BGN)		
1. Voice telephony services	1,337.972	1,264.695	1,204.420
1.1. Fixed voice service through geographic numbers from the NNP, Carrier Selection service and public payphones	172.640	136.744	117.875
1.2. Mobile telephony service through numbers from the NNP	1,153.572	1,115.949	1,069.931
1.3. Other voice services[2]	11.759	12.002	16.614
2. Leased lines services	26.597	23.212	20.147
3. Data transfer and/or Internet access services	709.554	750.475	887.172
4. Transmission and/or distribution of radio and/or TV programmes services	350.087	347.292	403.914
5. Other services[3]	55.759	56.650	61.450
TOTAL	**2,479.969**	**2,442.323**	**2,577.104**

[1] The data for 2017 have been updated

[2] Includes revenue from the provision VoIP (voice IP service where no NNP numbers (geographic or non-geographic) numbers are used, the service quality is not guaranteed, and the user must use/have Internet access through the respective device – computer/telephone)

[3] The segment includes revenues from the provision of duct network access, satellite systems access service, shared use, including provision of towers, masts, dark fibre, co-location services other than those provided for interconnection and other servicese

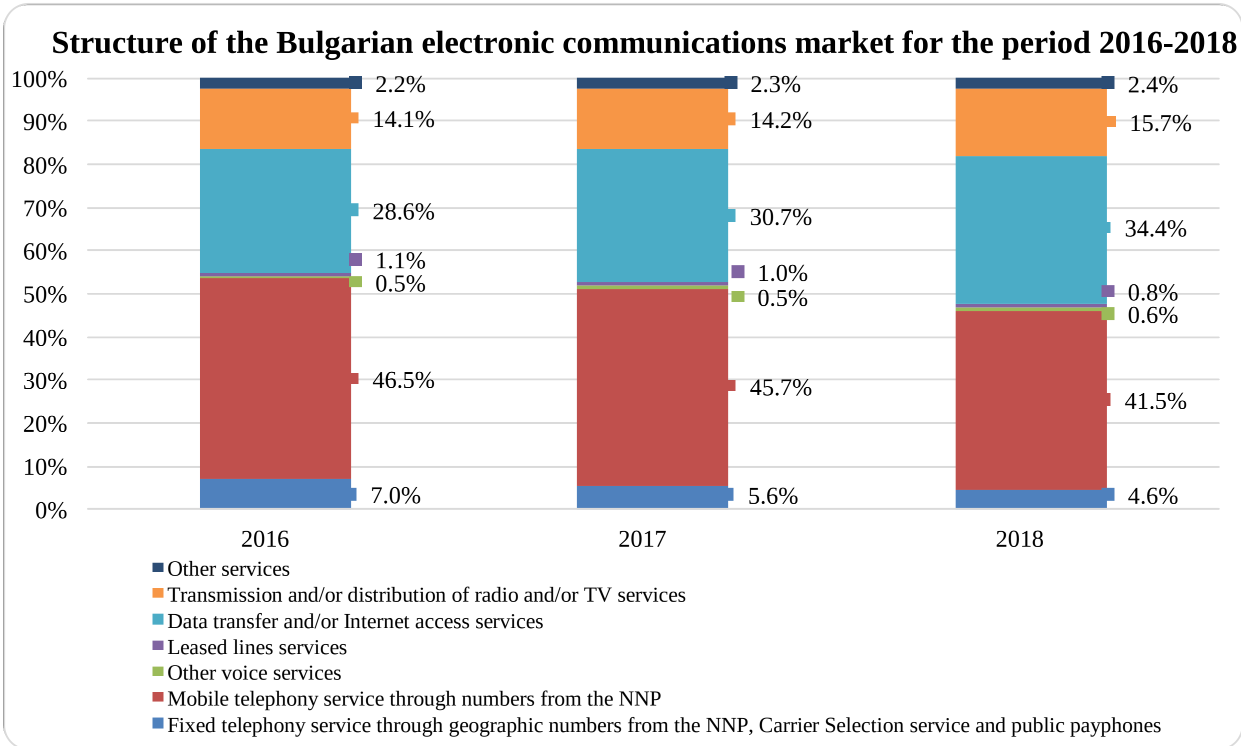
Source: Data submitted to CRC

minutes to national fixed and/or mobile networks, Internet download speed, number of television programmes, etc. included in the monthly subscription fee) of services included in the bundled service.

In 2018, the total volume of the electronic communications market continued to be determined mainly by revenue from voice services and data transfer and/or Internet access services.

Although revenue from voice telephony services (fixed, mobile and other voice services) continued to drop both in absolute (by 4.8% for a one-year period) and in relative value (by 5.1 percentage points), their share in the total volume of the public electronic communications market in 2018 preserved its leading position with 46.7%. The data transfer and/or Internet access services that took up 34.4% of the total market volume ranked second. The relative share of revenue from this market segment within the market structure increased by 3.7 percentage points compared to 2017.

Figure 2 presents the dynamics in the relative shares of revenue from electronic communication services within the structure of the electronic communications market for the period 2016 – 2018.



Source: Data submitted to CRC

Figure 2

As compared to the year before, revenue in three market segments registered a growth in 2018, namely:

✓ ”Data transfer and/or Internet access“ – 18.2%; over a one-year period, the relative share of the segment grew by nearly 4 percentage points. This growth is mainly due to the ”Data transfer and/or Internet access via mobile terrestrial networks“ group, as its revenue was up by 32.8%;

✓ “Transmission and/or distribution of radio and TV programmes services” rose by 16.3%. This is due both to the considerable increase of revenue from IPTV (by 46.1% compared to 2017) and to the increase (by 13.4% versus 2017) of revenue from satellite television;

✓ “Other services” registered a growth of 8.5%. The major increase here was observed in the “Access to satellite systems” service, the revenue from which grew by 14.6% compared to 2017, and in the ”Co-location and other forms of shared use”, including the provision of access to towers, masts, etc. (by 12.4% since 2017). Revenues from the “Provision of access to duct” service, included in this segment, also registered a growth of 4.2%.

The segments that reported a drop in their volume during the reporting period are:

✓ “Voice telephony services” reported a drop for another consecutive year – 4.8% in absolute value, the most significant decrease being observed in the fixed telephony service – 13.8%. In this segment, however, a considerable growth of revenue from VoIP was observed (by 66.8% versus 2017).

✓ “Leased lines services” continued to register a decrease which amounted to 13.2% in 2018 as compared to 2017.

1.2.1 Bundled services

Even though revenues from bundled services in Table 1 and in Figure 2 above are not presented as a separate segment of the market structure, it should be noted that they continue to play a key role in the electronic communications market in Bulgaria. In 2018, for another consecutive year, consumption of bundled services in Bulgaria increased - as of 31.12.2018, 46% of fixed telephony service subscribers, 66% of mobile telephony service subscribers, 35% of fixed Internet access subscribers, 82% of mobile Internet access subscribers, and 32% of pay TV subscribers used the service in a bundle with other electronic communications services. As a result, the total volume of revenue (from installation fees and monthly subscription fees) gained from bundled services reached BGN 1,041.267 million,[8] which represents a growth of 17.6% compared to the revenue in the previous year.

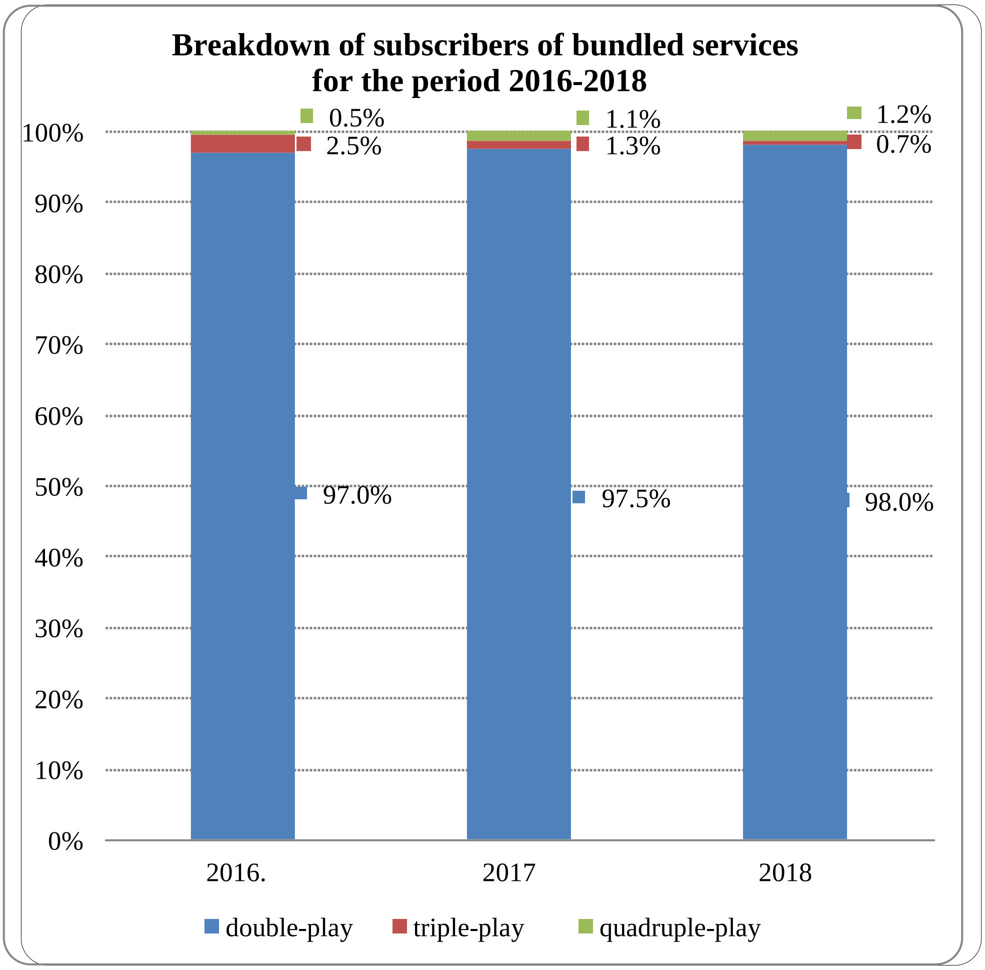
According to the data submitted to CRC in 2018, two undertakings have launched activity for the provision of a bundled service - double-play package including fixed Internet access and television. In this way, in 2018, the total number of undertakings providing bundled services amounted to 89, which is by 5 less in comparison with the previous year (94 in 2017).

Subscribers of bundled services

The number of subscribers of bundled services toward the end of 2018, according to the data submitted by the undertakings providing public electronic communications in Bulgaria, increased compared to the previous year by 14.5% to reach 6.14 million. As a result, in the period 2017-2018, the value of the “penetration by population”[9] indicator also grew by 11.7 percentage points, thus reaching 87.7%.

The breakdown of subscribers by types of bundled services, according to the number of electronic communications services included, in Bulgaria is presented in Figure 3.

[8] The data are included in the total volume of the electronic communications market, distributed by services but presented with a view to achieving comparability with previous years.
[9] This indicator was calculated as the ratio between the total number of subscribers of bundled services and the number of population as of 31.12.2018, according to NSI data (population by districts, municipalities, place of residence and sex: www.nsi.bg)

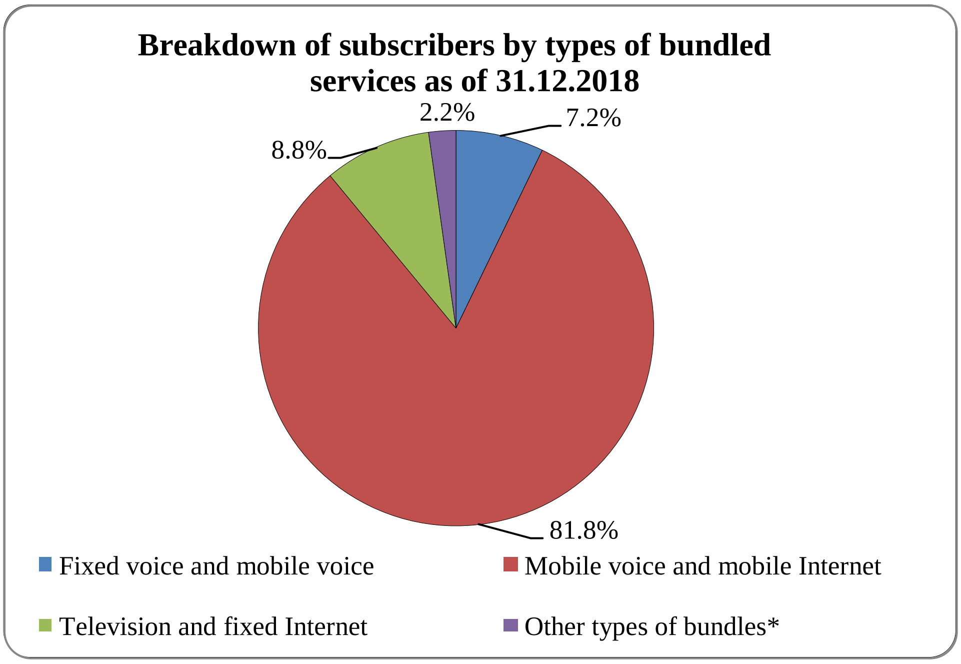


Source: Data submitted to CRC

Figure 3

The data presented in Figure 3 confirm the upward trend in the share of packages including two electronic communications services (double-play packages) which has been observed during the recent years. In 2018, double-play packages covered 98.0% of the total number of subscribers of bundled services, as the number of subscribers to this kind of packages increased by 15.0% compared to the 2017 data. The interest toward quadruple-play packages continued to increase, registering a growth of 24.8% compared to 2017. In 2018, as it was the case the year before, the number of subscribers of triple-play packages dropped significantly (by 37.1%), mainly as a result of the reduction (by 46.1%) in the number of subscribers of the "fixed voice, TV and fixed Internet access" package. This also affects the share of triple-play packages in the total number of subscribers in which a decline of 0.6 percentage points against 2017 was registered, at the expense of an increase in the share of double- and quadruple-play packages.

Figure 4 presents the breakdown of subscribers by the most preferred bundled services in 2018.



Note: *"Other types of bundles" include the subscribers of bundled services, the share of which does not exceed 2% of the total number of subscribers of bundled services.*

Source: Data submitted to CRC

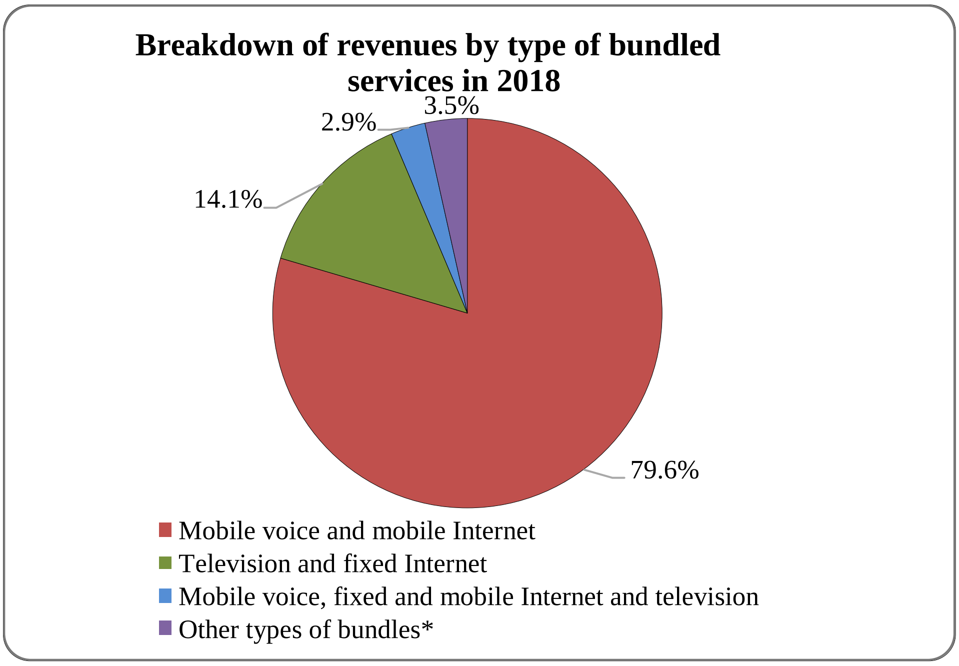
Figure 4

The number of subscribers of the most preferred bundled service – "Mobile voice and mobile Internet access" - grew by 19.7% as compared to 2017, reaching 5.021 million at the end of 2018. In 2018, 81.8% of the subscribers of bundled services used double-play bundled service including mobile voice and mobile Internet access, registering an increase of 3.6 percentage points in relative value. The number of subscribers of the second most used bundle ("Television and fixed Internet access") dropped by 7.7% to arrive at 538 thousand in 2018. "Fixed voice service and mobile voice service" bundle, with a relative share of 7.2% of the total number of bundled services subscribers, was used by 441 thousand subscribers, up by 2.3% versus 2017. Despite their still insignificant share (below 2%), a growth was observed in the triple-play package including mobile voice, fixed and mobile Internet (by 84.0%) and in the quadruple-play package including mobile voice, fixed and mobile Internet and television (by 30.3%).

Revenue from bundled services

Revenue from bundled services amounted to BGN 1,041.267 million in 2018, registering a growth of 17.6% year-on-year. The highest share (95.1%) in the total volume of revenue from these services continued to be held by double-play services which, as compared to 2017, reported a growth of 18.2% in absolute value and by 0.4 percentage points in relative value. The share of revenue from triple-play bundles continued its downward trend in 2018 (by 1.4 percentage points), which is a consequence of the reported 35.3% drop in absolute value. Revenue from quadruple-play bundles was up by 68.7% versus 2017, reaching 3.1% of the total volume of revenue in the segment.

Figure 5 presents the breakdown of revenue by types of bundled services in 2018.



Note: "Other types of bundles" include revenue from packages, the share of which does not exceed 2% of the total revenue from bundled services.

Source: Data submitted to CRC

Figure 5

In 2018, the share of revenue from double-play service including mobile voice service and mobile Internet access grew by 2 percentage points from 2017 to reach 79.6% of the total volume of the segment, and the registered growth of revenue in absolute value was 20.6%. The revenue from double-play bundled service "television and fixed Internet" reported an increase of 9.4% versus 2017; however, there is a decline of 1.0 percentage point in their share in total revenue as compared to 2017. In 2018, the downward trend in the revenue from triple-play bundled service including fixed voice, television and fixed Internet continued, with the share of revenue from this bundled service already dropping below the set threshold of 2%. The place of this bundle was taken by the quadruple bundled service "mobile voice, fixed and mobile Internet and television", with a smoothly growing share since 2015 to reach 2.9% in 2018. In absolute value, the revenue from this bundle grew by 74.4% for a one-year period. The highest growth in revenue in 2018, compared to 2017, was reported in triple-play bundle "mobile voice, fixed and mobile Internet" – 79.6%, which, however, still makes up a negligible share of the total revenue (0.2%).

Summary

In 2018, the following trends were observed in the "Bundled services" segment:

- the consumption of double- and quadruple-play bundles continued to grow at the expense of triple-play bundles;

- once again, the most preferred bundled services were those that included mobile service – 90.4% of the total number of subscribers used bundles with mobile voice included, while 83.1% of the subscribers used bundles with mobile Internet included;

- the growth in the total volume of revenue from bundled services was mainly due to the higher revenue generated from bundles with mobile service included (mobile voice and/or mobile Internet).

1.2.2 Investments

In 2018, 430 undertakings (403 in 2017) invested in the building and maintenance of public electronic communications networks BGN 438.060 million out of the planned BGN 382.713 million in 2017, which shows that the investments made were by 14.5% more than those planned for 2018.

During the year, BGN 147.031 million were invested in fixed networks for the provision of electronic communication services, of which BGN 86.782 million (by BGN 13.223 million more than the previous year) were invested in next-generation access (NGA) networks. This leads to an increase of 2 percentage points of the share of NGA network investments in the total investment volume, which was 19.8% for 2018. In 2018, the number of undertakings that have invested in next-generation access networks increased by 25 compared to 2017 (193 undertakings in 2018 compared to 168 undertakings in 2017).

In 2018, the investments in mobile networks were 24.5% of the total investments of the undertakings, registering a drop of 14.2 percentage points for a one-year period. The investments made amounted to BGN 107.187 million - by 8.3% less than the investments in mobile networks planned by the undertakings for 2018.

2. Voice telephony services

The “Voice telephony services” segment includes the following services: fixed telephony service through geographic numbers from the National Numbering Plan (NNP), access to public telephony service through the “Carrier Selection” service, telephony services via public payphones, mobile telephone service through numbers from the NNP (including SMS[10] and MMS[11]) and other voice services (VoIP[12] services, provision of voice service through commercial representation, etc.).

Table 2 presents summarised information on the reviewed segment in 2018, namely: the number of undertakings which provided services in this market segment, the number of their subscribers/lines that used voice telephony services, and the revenue from services provided.

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[10] Short message service
[11] Multimedia messaging service
[12] Voice IP service where no NNP numbers are used, the service has no guaranteed quality and the user must use/have Internet access through the respective device - computer/telephone.

Table 2

Number of undertakings, subscribers/lines and revenue by type of voice telephony services provided in 2018

Service	Number of undertakings providing the service as of 31.12.2018	Number of subscribers/lines as of 31.12.2018		Revenue (in millions BGN, excl. VAT)	
		Total [1]	including bundled service subscribers	Total [2]	including bundled services
1. Fixed telephony service	///	///	///	**117.875**	**8.855**
1.1. Fixed telephony service through numbers from the NNP and Carrier Selection service	25	1,080,760*	495,704	117.491	8.855
1.2. Telephony service through public payphones	3	6,340**	///	0.384	///
2. Mobile telephony service through numbers from the NNP	4	8,387,160	5,550,008	**1,069.931**	**550.714**
3. Other voice services	25	///	///	**16.614**	///
Total		///	///	**1,204.420**	**559.570**

[1] Including subscribers of bundled services

[2] Including the share of revenue from the provision of voice services bundled with other electronic communication services

* Number of lines of fixed telephony service subscribers

** Number of public payphones/telephone booths

Note: *The symbol /// used in this document means that the information is not applicable to the indicated parameter or is confidential.*

Source: Data submitted to CRC

At the end of 2018, the number of undertakings which declared activity on providing fixed telephony service amounted to 25, which was by one undertaking more than at the end of 2017.[13] The undertakings which provided services from the "Mobile telephony service through NNP numbers" group also increased by one, and so the number of active undertakings as of 31.12.2018 was four. At the end of 2018, other voice services were provided by 25 undertakings, compared to 28 the year before. The number of undertakings providing telephony service through public payphones/telephone booths remained unchanged - a total of 3 undertakings, including the "Bulgarian Telecommunications Company" EAD (BTC).

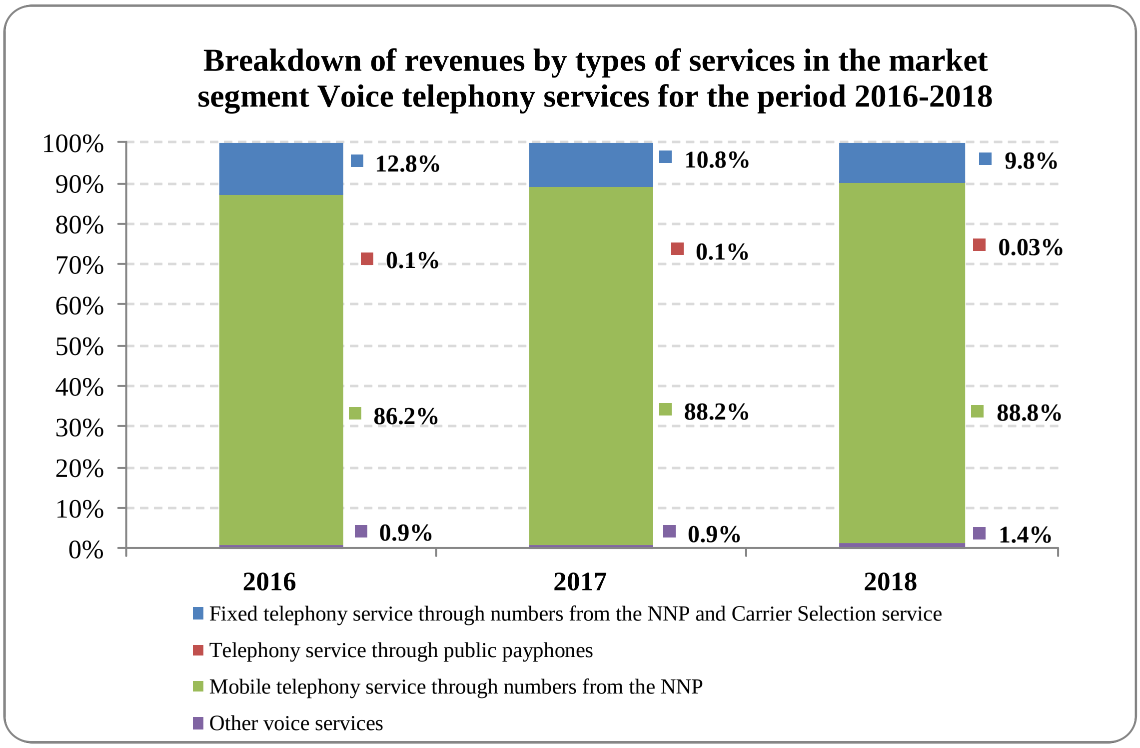
In 2018, the total volume of revenue generated from voice telephony services with revenue from bundled services included amounted to BGN 1,204.420 million, registering a decline (by 4.8%) compared to the preceding year 2017 when the volume of the segment amounted to BGN 1,264.695 million.[14]

The downward trend in revenue generated in the "Voice telephony services" segment continued for another consecutive year, as in 2018 it was provoked by a decline in the revenue from almost all groups of services included in the segment. An exception was made by the total revenue from other voice services where an increase of 38.4% was reported, mainly due to the

[13] Detailed information on the provision of fixed and mobile telephony services is presented in section 2.1 and section 2.2.
[14] The 2016 and 2017 indicators were recalculated to include the revenue from installation fees and monthly subscription fees for fixed and mobile telephony service provided bundled with other electronic communication services.

growth in the provision of VoIP services in 2018 by 66.8% compared to the year before. In the remaining groups, the decrease compared to 2017 was as follows: 13.7% drop in revenue from fixed telephony service through NNP numbers and the Carrier Selection service; 4.1% drop in revenue from mobile telephony service and 40.3% drop in revenue from public payphones/telephone booths.

Figure 6 shows the distribution of revenue from different services in the segment volume for the period 2016 - 2018.



Source: Data submitted to CRC

Figure 6

In 2018, no significant change was observed in the structure of the “Voice telephony services” market segment, presented as revenue by types of services included in the segment. The highest share in the total segment volume was held by mobile telephony service (88.8% versus 88.2% for the previous year), followed by revenue from fixed telephony service through NNP numbers and the Carrier Selection service (9.8% versus 10.8% in 2017).

2.1. Fixed telephony service

Market players

At the end of 2018, the total number of undertakings authorised by CRC[15] to provide access to fixed telephony service through primary assigned resource - geographic numbers - and access to public telephony service through the Carrier Selection service was 24. A total of 11 undertakings were registered for their intention to provide public electronic communication services through resale of fixed telephony service through secondary assigned numbers.

[15] Undertakings authorised to use an individually assigned scarce resource - numbers from the National Numbering Plan (NNP) - for the provision of fixed telephony service.

At the end of 2018, a total of 19 undertakings provided access to fixed telephony service to end-users through primary assigned resource – geographic numbers – which is by one undertaking less than in 2017, since Vestitel BG AD ceased its activity on the provision of fixed telephony service in 2018. Four undertakings declared that they provided activity on resale of fixed telephony service through secondary assigned numbers. Two of the authorised undertakings provided only wholesale services ("transit" and "physical interconnection") related to the provision of fixed telephony service. As a result, at the end of 2018, the number of active undertakings providing fixed telephony service totalled 25, as 23 of them provided access to fixed telephony service through geographic numbers to subscribers, including resale through secondary assigned numbers.

In 2018, the major providers of fixed telephony service to end-users (retail service) were BTC, A1 Bulgaria EAD (A1) and Telenor Bulgaria EAD (Telenor).

Table 3

Market share of undertakings providing retail fixed telephony service

Undertaking	2017		2018	
	Share based on number of subscr. lines	Share based on revenue	Share based on number of subscr. lines	Share based on revenue
BTC	61.7%	84.6%	60.7%	84.0%
A1 BULGARIA EAD	23.1%	6.6%	23.7%	7.7%
TELENOR BULGARIA EAD	13.4%	5.5%	13.5%	5.2%
All other	1.9%	3.4%	2.2%	3.2%

Source: Data submitted to CRC

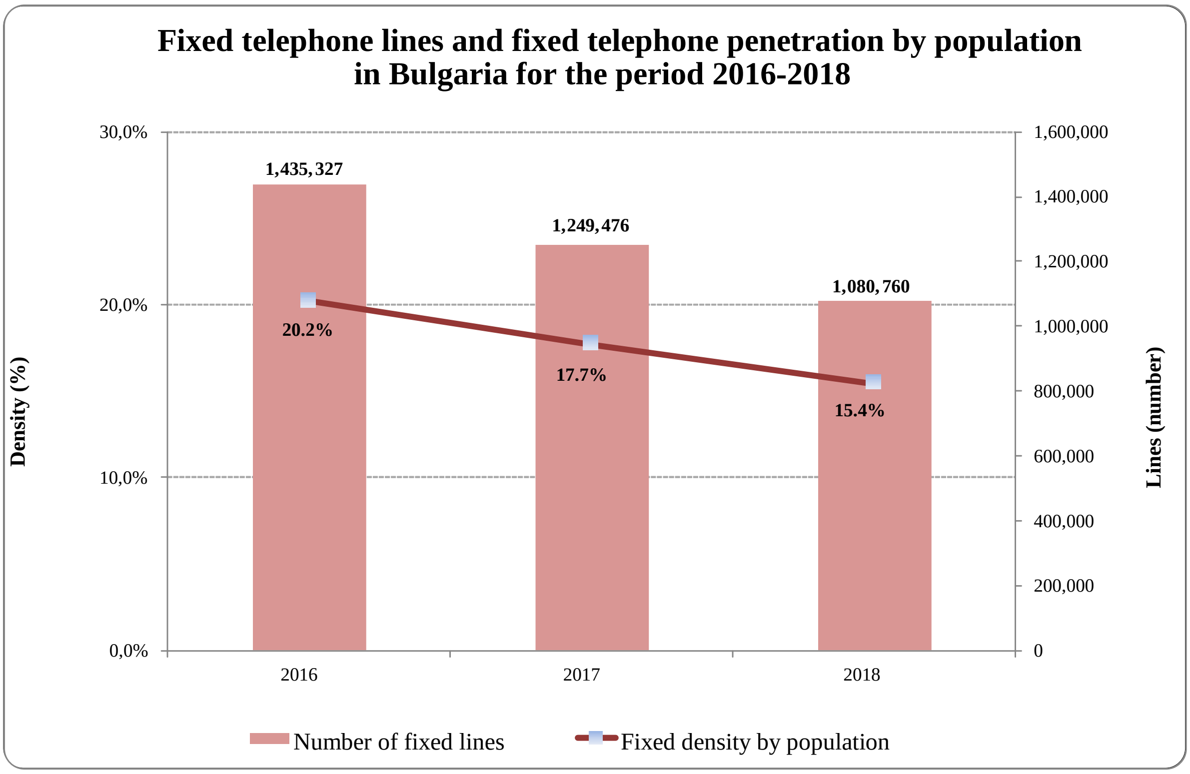
As is evident from the data presented in the table, in 2018, compared to 2017, no significant change was observed in the market shares of undertakings forming about 98% of the market, measured by the number of fixed telephone lines of fixed telephony service subscribers and about 97% of revenue generated from retail services. In 2018, BTC continued to hold the largest market share based on fixed telephone lines, registering a decline of 1.0 percentage point since 2017, followed by A1 and Telenor which reported an insignificant increase of 0.6 percentage points and 0.1 percentage points, respectively, over a one-year period.

No significant changes in the market shares were reported based on revenue from the provision of fixed telephony service to end subscribers, including the part of revenue from the provision of the service bundled with other electronic communication services – BTC registered a year-on-year drop of 0.6 percentage points compared to 2017. The market share of A1, calculated based on retail revenue, rose by 1.1 percentage points compared to the year before, while that of Telenor was down by 0.3 percentage points.

Telephone lines of fixed telephony service subscribers

According to the information submitted by the undertakings with regard to their activity on the provision of access to the fixed telephony service to end-users in 2018, there was a decrease in the number of fixed telephone lines for yet another year. The decline in 2018, compared to 2017, was 13.5%, which is by 0.6 percentage points more than the decrease in 2017, compared to 2016 (12.9%). This was due not only to the decreased number of fixed telephone lines of the undertaking by 14.9%, but also to the drop in the total number of fixed telephone lines of subscribers of the alternative undertakings by 11.2%.

Figure 7 presents information on the variation in the number of fixed telephone lines and the fixed density by population for a three-year period.



Source: Data submitted to CRC

Figure 7

The decreasing interest of voice services users in the fixed telephony service leads to a year-on-year drop in the number of fixed telephone lines, with a total registered decline in this indicator of 24.7% for the three-year period under review (2016-2018). As a result of the decline in the total number of fixed telephone lines, the value of the fixed telephone density by population indicator also decreased in 2018, reaching 15.4%.[16]

Consumption (traffic) of fixed telephony service

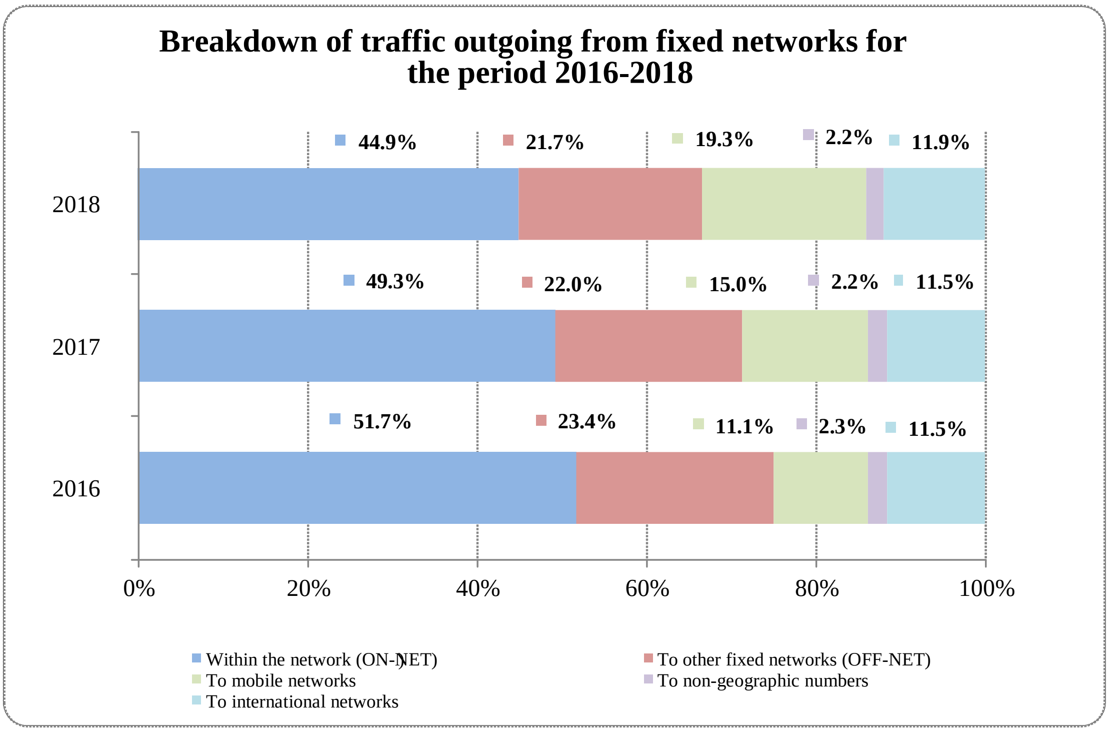
The annual decline in the number of fixed telephony subscribers, as expected, resulted in a decrease in the total consumption of the service. In 2018, the volume of outgoing traffic (in minutes), originated by the users[17] for national (local and long-distance calls, calls to mobile networks and non-geographic numbers) and international calls amounted to 636.07 million minutes, down by 17.9% compared to 2017 – to compare with, the decrease in the previous one-year period was by 19.9%.

Over the last years, the development of the fixed telephony service found is characterized in the increasing telephone traffic volume included in the monthly subscription

[16] The “fixed density by population” indicator was calculated as the ratio between the total number of active telephone lines as of 31.12.2018 and the number of population as of 31.12.2018, according to NSI data (population by districts, municipalities, place of residence and sex: http://www.nsi.bg/bg/node/2972);
[17] Includes traffic originated by subscribers of fixed telephony services (including the Carrier Selection service), as well as traffic originated from public payphones/booths.

fees. The traffic from calls which was paid by subscribers beyond their monthly subscription made up only 15.3% of the total generated traffic, as its share dropped by 2.5 percentage points over a one-year period. That, in addition to the steady trend towards decrease in the consumption of the service in general, led, as expected, to the discontinued use of the Carrier Selection service. Only one undertaking declared that it provided that service in 2018 with symbolic consumption, as measured in volume by the generated traffic and realised revenue.

The structure of consumption, with a view to call destinations, did not change significantly in 2018 compared to the previous years. Figure 8 displays the breakdown of the total volume of traffic generated from fixed networks.



Source: Data submitted to CRC

Figure 8

Similarly to the previous years, the major part of the total traffic originated in 2018 was formed by the traffic within the network (on-net) - 44.9%. For yet another year, the traffic volume decreased considerably – by 25.2% compared to the year before, with a decrease of 23.6% for the period 2016-2017. A decline was also observed in the volume of traffic generated from calls to other fixed networks (off-net) - by 19.1%, and in international calls - by 14.3%. A growth was once again registered only in calls to mobile networks - by 5.6% in 2018 versus 8.1% the year before. This was greatly due to the increased volume of this type of traffic, included in the fixed telephony service subscriptions. According to the data submitted by the undertakings providing fixed telephony services, in 2018, 80.5% of the total traffic was from consumption included in subscriptions, registering a growth in this indicator compared to the previous year when its value was 71.3%.

All in all, in 2018, 84.7% of the total traffic generated by subscribers of fixed telephony service represented minutes included in the monthly subscriptions. The increase of this share inevitably affects the structure of revenue from fixed telephony service.

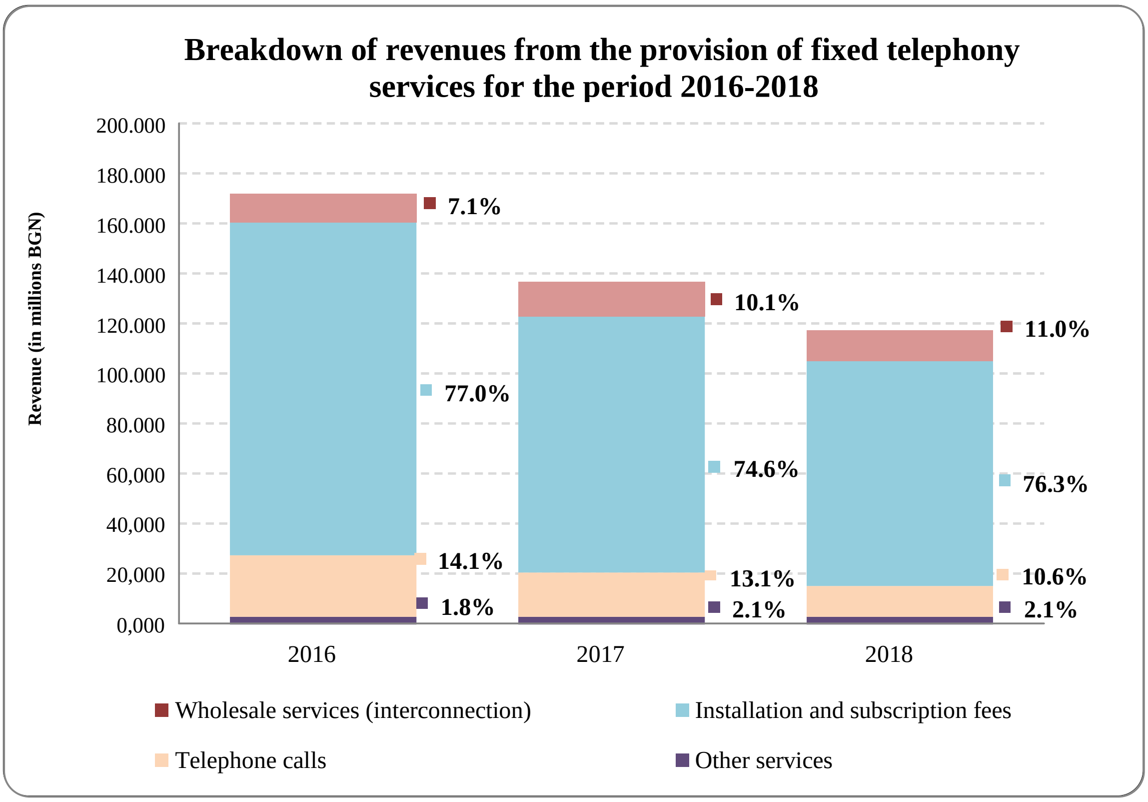
Revenue from fixed telephony service

In 2018, the total volume of revenue generated from the provision of fixed telephony service[18] amounted to BGN 117.875 million, registering a decline of 13.8% compared to 2017, with 20.8% for the preceding one-year period.

The main changes reported in terms of revenue generated from fixed telephony service in 2018 are as follows:

- drop in the volume of revenue generated from the provision of access to the fixed telephony service (installation and subscription fees) of 11.9% compared to 2017;
- due to the increasing share of consumed "free minutes" included in the monthly subscription fees, as well as due to the year-on-year drop in consumption, the revenue generated from traffic beyond subscription fees registered a decline of 30.2% versus 2017;
- decrease in the volume of revenue from wholesale services (including interconnection services - origination, termination, transit and physical interconnection) by 6.2%.

The figure below displays the breakdown (structure) of total revenue from fixed telephony service by main groups for the period 2016-2018.



Source: Data submitted to CRC

Figure 9

As it is evident from the data, in the period 2016-2018, the structure of the fixed telephony service market did not change significantly – installation and subscription fees from the provision of the service to end-users, both as a standalone service and as part of a bundled service, formed the main part of the total revenue from fixed telephony service (76.3% in 2018). As a result of the decreased consumption of the service and the adding of a considerable number

[18] Including revenue from calls through the Carrier Selection service and public payphones/booths.

of minutes to the subscription plans, the revenue from telephone calls traffic is decreasing year by year which also reflects on their share in the total revenue volume which was 10.6% in 2018.

Public payphones

According to data provided by the undertakings, at the end of 2018, the number of public payphones and telephone booths in the country registered yet another decline (by 4.5%) on a yearly basis and reached 6,340. The traffic generated from public payphones and booths formed as little as 0.3% of the total traffic from the fixed voice telephony service. In 2018, its volume stayed approximately at the level of the previous year, as even a small growth of 6.1% was observed.

As a whole, the traffic, revenue and number of maintained public payphones and telephone booths was almost entirely generated from the BTC's activity arising from the obligations of the undertaking in its capacity as universal service provider.[19]

Summary

In 2018, for yet another year, the decreasing interest of users in the fixed telephony service resulted in a decrease in the values of all basic parameters, as follows:

- decline in the total number of fixed telephone lines, including when the service is used in a bundle with other electronic communication services;
- the decreased consumption of the service, combined with the increasing share of minutes included in subscription plans, led to a drop in the revenue from the provision of fixed telephony service.

2.2. Mobile telephony service

Market players

In 2018, the total number of undertakings authorised by CRC[20] to provide the mobile telephony service was 5: A1, BTC, Bulsatcom EAD (Bulsatcom), Telenor and Ti.Com AD. The data submitted to CRC reporting their activity in 2018 show that 4 of the undertakings actually offered and provided the service in the market in 2018 - A1, BTC, Bulsatcom and Telenor. With its Decision No 510/14.09.2017, CRC transferred the authorisations of Max Telecom OOD to Ti.Com AD. Ti.Com AD did not provide mobile telephony service in 2018.

As is evident from the data presented in the table below, as of 31.12.2018, A1 continued to hold the largest market share in the mobile telephony service segment by number of subscribers. In 2018,[21] the largest market share based on revenue from the provision of retail mobile telephony service was held by Telenor. The market share of Bulsatkom , both by number of subscribers and by revenue, was symbolic.

[19] Detailed information on the provision of universal service is presented in section 8.

[20] Undertakings authorised to use an individually assigned scarce resource - numbers from the NNP - for the provision of mobile telephony service.

[21] Market shares were calculated based on revenue from the provision of retail mobile telephony service (revenue from retail service provided standalone and the part of revenue provided bundled with other electronic communication services). In the 2010-2017 Annual Reports of CRC, market shares based on revenue were calculated based on revenue from the provision of wholesale mobile telephony service and revenue from retail service provided standalone, excluding the part of revenue provided bundled with other electronic communication services).

Table 4

Market share of undertakings providing retail mobile telephony service

Undertaking	2017		2018	
	Share based on number of subscribers	Share based on revenue	Share based on number of subscribers	Share based on revenue
A1 BULGARIA EAD	39.3%	36.5%	39.4%	34.0%
TELENOR BULGARIA EAD	32.9%	37.6%	32.9%	38.9%
BTC	27.8%	25.9%	27.7%	27.0%
MAX TELECOM OOD	0.0%*	0.02%	///	///
BULSATCOM EAD**	0.0%	0.0%	0.01%	0.01%
TI.COM AD***	0.0%	0.0%	0.0%	0.0%

*As of 31.12.2017, the undertaking had no subscribers of mobile telephony service.
**The undertaking did not provide mobile telephony service in 2017.
***The undertaking did not provide mobile telephony service in 2017 and in 2018.

Source: Data submitted to CRC

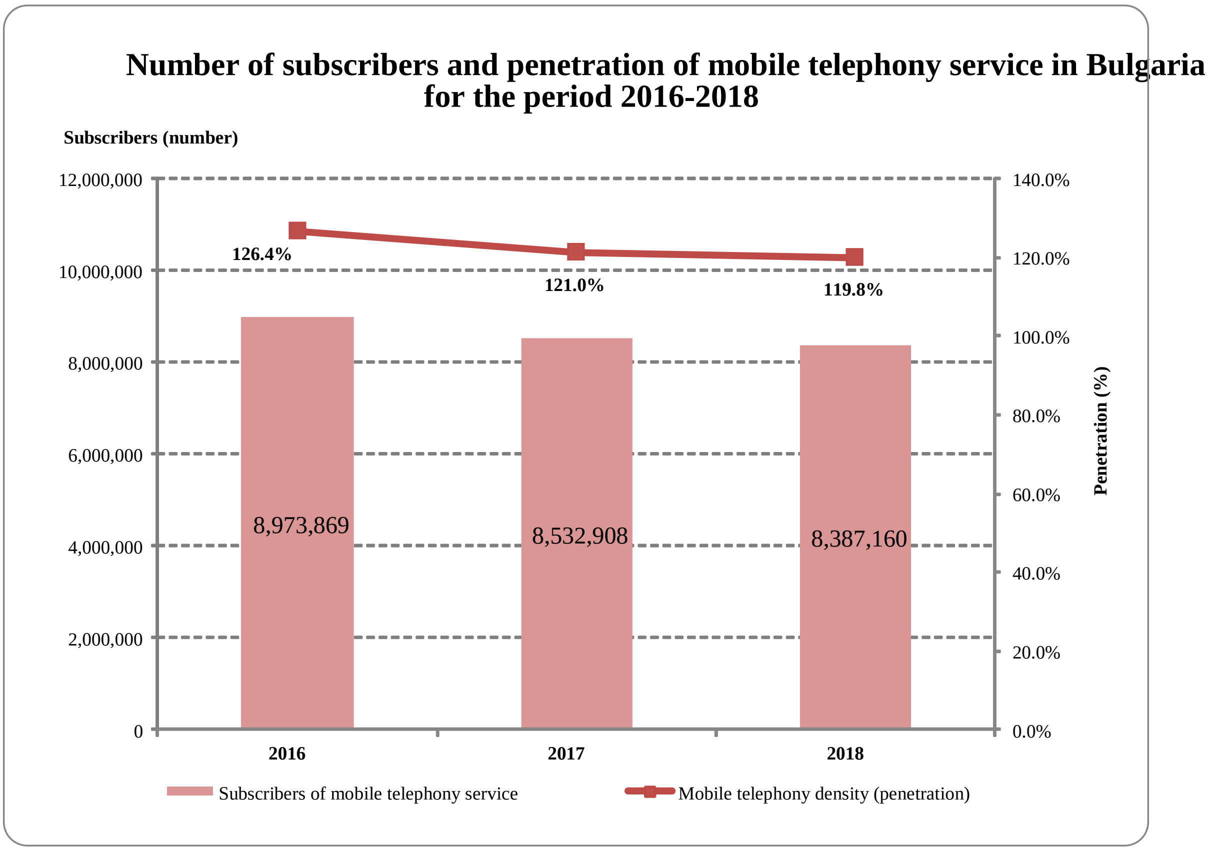
The data presented in Table 4 show that fluctuations in the market shares of A1, Telenor and BTC in 2018 were insignificant and did not lead to rearrangement of the positions in the segment compared to the previous year 2017:

- the relative share of A1, calculated on the basis of number of subscribers, rose by 0.1 percentage points for a one-year period, while the one calculated on the basis of revenue fell by 2.5 percentage points.
- the relative share of Telenor, calculated on the basis of number of subscribers, remained unchanged for a one-year period, while the one calculated on the basis of revenue was up by 1.3 percentage points.
- the relative share of BTC, calculated on the basis of number of subscribers, dropped by 0.1 percentage points for a one-year period, while the one calculated on the basis of revenue rose by 1.1 percentage points.

Subscribers of mobile telephony service

As of 31.12.2018, the number of subscribers of mobile telephony service (number of unique SIM cards) amounted to 8,387,160, registering a slight drop for a one-year period (by 1.7% less than in 2017; as of 31.12.2017, the number of subscribers was 8,532,908). According to the data submitted to CRC by the undertakings, the drop continued to be mainly provoked by a decrease in the number of prepaid cards (down by 7.7%) and an insignificant decline in the number of postpaid subscribers (by 0.5%). The figure below presents information on the number of subscribers of mobile telephony service and service penetration (“mobile telephone density”) among the population for the period 2016-2018.[22]

[22] The “mobile telephone density” indicator was calculated as the ratio between the number of subscribers of mobile telephony services as of 31.12.2018 and the number of population as of 31.12.2018, according to NSI data (population by districts, municipalities, place of residence and sex: http://www.nsi.bg/bg/node/2972).

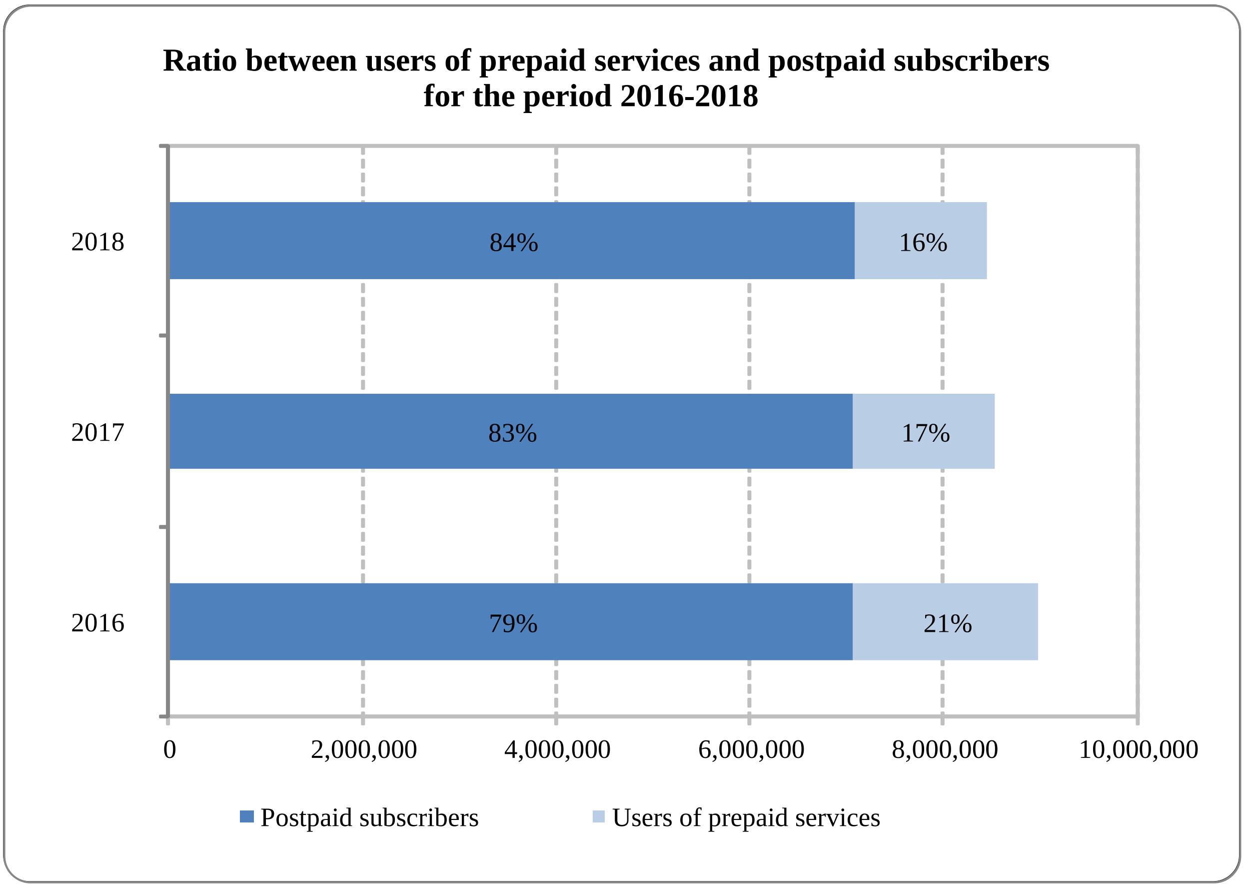


Source: Data submitted to CRC

Figure 10

At the end of 2018, penetration of mobile telephony service in Bulgaria reached 119.8%. As compared to the previous two years, in 2018, there was a delay in the downward trend in the number of subscribers of mobile telephony service, as a result of which, as evident from the data presented in Figure 10, the drop rate in the “mobile telephony density” indicator also slowed down and the decline registered in the last year was 1.2 percentage points.

Figure 11 below presents data about the ratio between the subscribers of prepaid mobile telephony service and postpaid subscribers. Unlike the considerable drop in the number of prepaid cards (by 22.5% versus 2016) which was observed in 2017, the decrease registered in 2018 had a much slighter negative impact on their relative share which was down by only 1 percentage point (to 16%) compared to 2017. Accordingly, the share of postpaid subscribers reached 84% of the total number of subscribers of mobile telephony service in the country at the end of 2018.



Source: Data submitted to CRC

Figure 11

The reasons for the decline registered in 2018 in the number and relative share of prepaid cards (Figure 8) are complex; on the one hand, there was the residual effect from the measures undertaken by mobile operators in 2017 in accordance with the LEC and the Counter-Terrorism Law[23] to deactivate prepaid SIM cards of users who had over 10 cards registered in their name, and on the other hand, there was migration from prepaid to postpaid service.

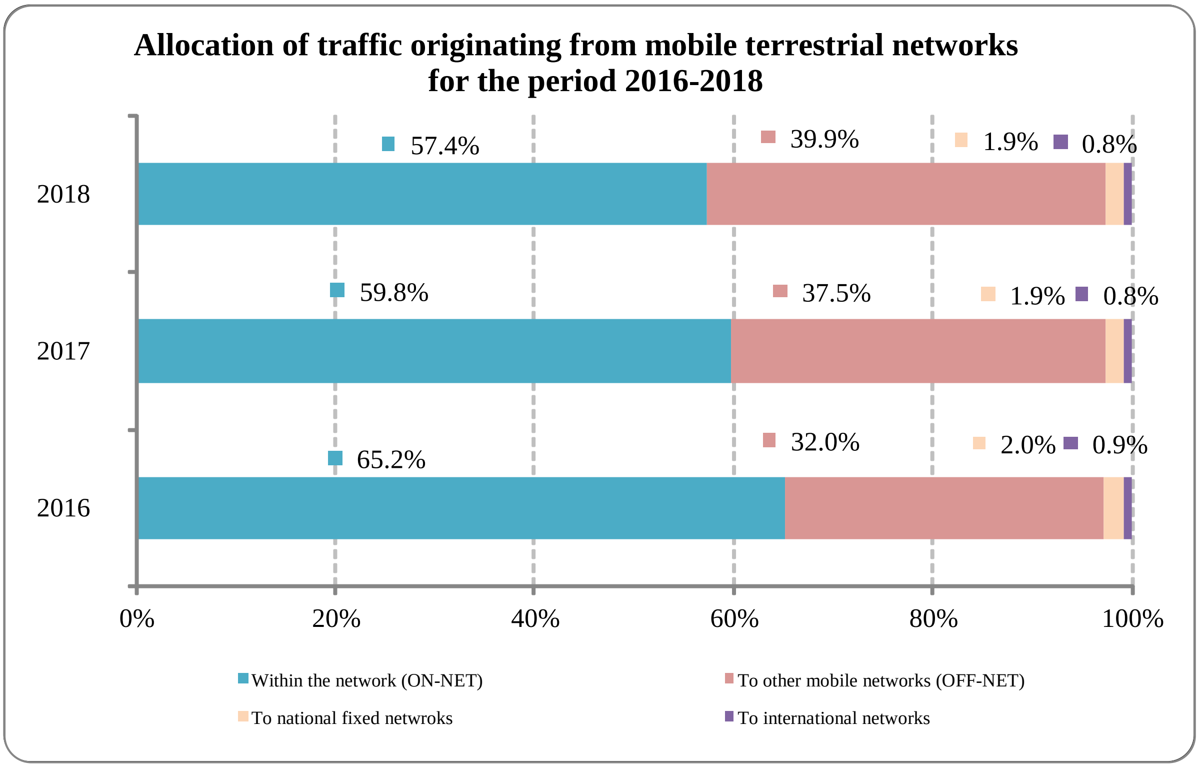
Consumption (traffic) of mobile telephony service

In 2018, the total volume of outgoing traffic[24] (in minutes) amounted to 19,372.17 million minutes, registering a growth of 2.8% compared to 2017. The reported growth in the consumption of mobile telephony service was due to an increase in minutes of calls originated to other mobile networks in the country (by 9.4%), to fixed networks in the country (by 2.3%), and to networks abroad (by 3.5%). On-net traffic continued to drop, registering a decline of 1.4% in 2018 versus 2017. The share of consumption (number of call minutes) in the total consumption of mobile telephony service by subscribers with prepaid SIM cards (4.1%) and by postpaid subscribers (95.9%) remained unchanged compared to their share of consumption

[23] Art. 138d of the LEC (SG, no. 103 of 27 December 2016): Undertakings providing public telephony services through fixed and/or mobile terrestrial networks do not have the right to register and/or activate in the name of one user more than 10 telephone numbers through which prepaid telephone services are provided.
[24] Including outgoing traffic generated by mobile telephony service subscribers within a mobile network (on-net traffic), to other mobile networks in the country (off-net traffic), to fixed networks in the country and to networks abroad.

reported in the previous year 2017. Both subscriber categories registered a growth in the number of call minutes since 2017, with an increase of 2.8% in postpaid subscribers and 1.8% in subscribers with prepaid cards.

The data presented in Figure 12 show that on-net traffic continued to hold the largest share (57.4%) in the total volume of traffic generated on mobile networks in the country in 2018. However, it continued to decrease, registering a drop of 7.8 percentage points for the period 2016-2018. In absolute value (number of minutes), on-net traffic was down by 5.5% for the same period.



Source: Data submitted to CRC

Figure 12

The share of both traffic to fixed networks in the country and traffic to international networks remained unchanged compared to 2017 (Figure 12).

The reported drop in the share of on-net traffic was due to the increase in the share of off-net traffic generated to other mobile networks in the country. In 2018, off-net calls occupied 39.9% of the total traffic originated in mobile networks in the country and registered a growth of 7.9 percentage points for the period 2016-2018. In absolute value, an increase by 34.2% in the off-net traffic was reported for the said period. The growth of off-net consumption which continued to be observed in 2018 shows that there was still a strong competition present in the mobile voice telephony service market and that end-users were offered favourable terms for off-net calls.

As a result of the user-friendly regulation of roaming charges ("Roam Like At Home") within the EEA countries introduced in 2017, the number of call roaming minutes (roaming outgoing calls) actually consumed by Bulgarian undertakings subscribers continued to increase - by 57.2%, while that of incoming calls grew by 46.3%.

Short multimedia and text messages

The steady downward trend in the number of sent SMS and MMS, as observed in the preceding years, continued in 2018 as well. For 2018, the number of sent SMS amounted to 397 million (down by 15.1% compared to 2017), while the number of sent MMS was 4.5 million (by 4.5% less than in 2017).

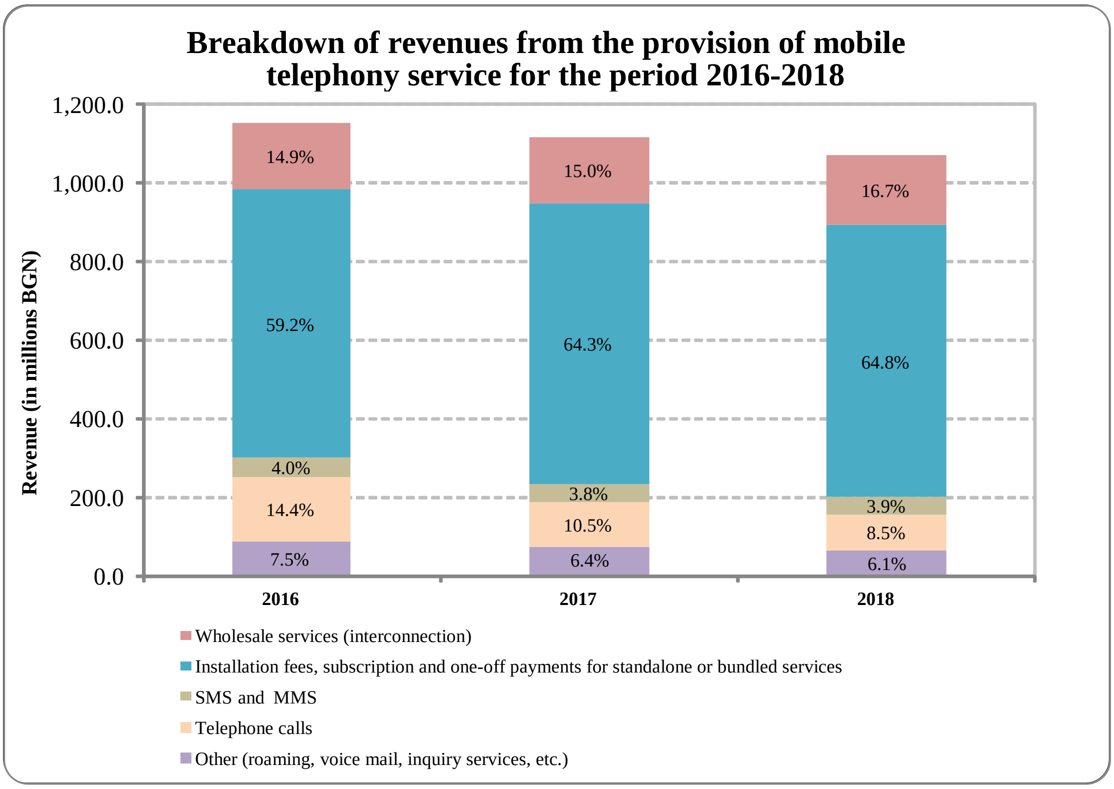
Although the above-mentioned regulation of roaming charges applies to roaming SMS as well, a drop in their consumption continued to be registered in 2018 - by 11.7%. The roaming MMS consumption for the same period grew 4 times.

Revenue from mobile telephony service

In 2018, revenue from the provision of mobile telephony service amounted to BGN 1,069.931 million, registering a drop for yet another year (by 4.1% as compared to the previous year 2017). The volume of revenue from the provision of retail mobile telephony service was BGN 891.367 million, while that of revenue from wholesale services amounted to BGN 178.564 million. The data available with CRC show that the decline in revenue from the provision of mobile telephony service registered in 2018 was entirely due to a drop in retail revenue - by 6.1%. As for revenue from wholesale services (interconnection), there was a growth of 6.9% versus 2017. The data analysis shows that the main reasons that have led to the registered decline in revenue from the provision of retail mobile telephony service were as follows:

- steady downward trend in the number of subscribers (by 26.1%) and in revenue (by 20.6%) from monthly subscription and installation fees from standalone provision of mobile telephony services, along with insufficient growth rate in the number of subscribers (by 18.2%) and revenue (by 6%) from the provision of the service bundled with other electronic communication services;
- in 2018, the volume of consumed "free-of-charge minutes" included in the monthly subscription fee reached 96.4% of the total consumption of the mobile telephony service, while the revenue from mobile calls dropped by 22.1% compared to the previous year 2017;
- even though the consumption of mobile telephony roaming service grew by 51.4% in 2018 versus 2017, the user-friendly regulation of "Roam Like At Home" charges of calls and SMS messages in the European Economic Area countries reflected on the revenue from mobile telephony roaming service and they dropped by 10.3%.

The figure below presents the breakdown (structure) of revenue from mobile telephony service for the period 2016-2018. The data displayed in Figure 13 show that revenue from monthly subscription and installation fees from both standalone and bundled provision of mobile telephony service retained their key role and, in 2018, they continued to occupy the largest share in the segment (64.8%). At the same time, the reported growth in 2018 in the total volume of wholesale revenue also had a positive effect on their share in the segment, reaching 16.7%. The share of revenue from telephone calls (8.5%) registered a decline for yet another year - by 2 percentage points.



Source: Data submitted to CRC

Figure 13

The remaining services in the segment did not register significant changes over a one-year period. The share of revenue from SMS and MMS messages registered an insignificant increase in 2018 (by 0.1 percentage point), while there was an insignificant drop in the share of revenue from other services (by 0.3 percentage points).

Summary

The development of mobile telephony service in 2018 continued to be characterised by a strong competition among the three major players on the market segment - A1, Telenor and BTC, as the following more important trends and changes were observed:

- a slowed drop in the number of subscribers of mobile telephony service compared to the previous year 2017;
- a continuing downward trend in the amount of revenue from the provision of mobile telephony service;
- as compared to 2017, a growth in the revenue from wholesale services (interconnection) was registered;
- a continuing steady upward trend in the amount of total consumption of mobile telephony service and a growth of roaming minutes actually consumed by subscribers of the Bulgarian undertakings.

3. Leased lines services

The data about the total revenue from the provision of leased lines services in 2018, including revenue from the provision of international leased lines, confirmed the categorical trend towards shrinking of this market segment which has been observed in the last several years. The total revenue from the provision of the service in 2018 amounted to BGN 14.238 million,[25] registering a drop of 21.3% compared to revenue generated the year before.

Summarised information on the number of undertakings that provided leased lines services and on the volume of revenue generated from them is presented in Table 5 below:

Table 5

Number of undertakings, number of lines and revenue by type of leased lines provided in 2018

Service	Number of undertakings providing the service in 2018	Number of leased lines as of 31.12.2018	Revenue in 2018 (in millions BGN, excl. VAT)
1. Wholesale leased lines	**20**	**2,301**	**9.543**
1.1. National leased lines	16	2,055	6.131
1.2. International leased lines	9	246	3.412
2. Retail leased lines	**10**	**2,199**	**4.695**
Total	**23**	///	**14.238**

Source: Data submitted to CRC

Market players

According to the information submitted to the Commission, 23 undertakings (from 100 that have notified CRC of their intention to provide leased lines services, and entered in the public register as of 31.12.2018) were active in the market segment. Eight undertakings provided the service both in the retail and in the wholesale market, while nine undertakings provided the international leased lines service.

Tables 6 and 7 present the market shares of the major undertakings providing retail/wholesale leased lines in 2018.

[25] Including revenue from national wholesale and retail leased lines, as well as revenue from national sections of international leased lines. Excluding revenue from sections of international leased lines outside the territory of the country.

Table 6

Market shares of undertakings providing retail leased lines

Undertaking	2017		2018	
	Share based on number of retail lines	Share based on retail revenue	Share based on number of retail lines	Share based on retail revenue
BTC	74.9%	79.8%	74.7%	69.7%
A1 BULGARIA EAD	14.8%	7.7%	12.5%	9.7%
SOFIA COMMUNICATIONS EAD	8.1%	9.0%	8.3%	10.8%
All other	2,2%	3.4%	4.5%	9.7%

Source: Data submitted to CRC

In 2018, as opposed to 2017, the total market share (95.5%) based on number of retail lines of the three major undertakings dropped by 2.3 percentage points, with the most significant decrease registered in the share of A1 – by 2.3 percentage points. Based on retail revenue, the decline reported in the share of the three undertakings was higher - by 6.3 percentage points. As a result, the remaining players increased their share proportionally, both by revenue and by number of lines.

Table 7

Market shares of undertakings providing wholesale leased lines

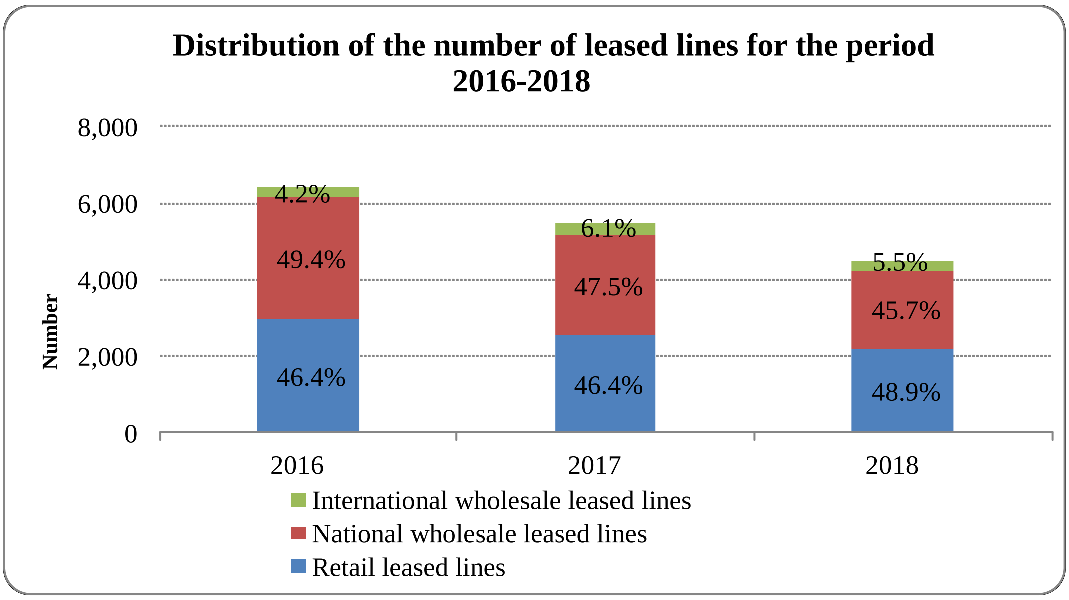
Undertaking	2017		2018	
	Share based on number of wholesale lines	Share based on wholesale revenue	Share based on number of wholesale lines	Share based on wholesale revenue
NOVATEL EOOD	28.5%	35.4%	25.1%	25.7%
SOFIA COMMUNICATIONS EAD	22.5%	8.9%	22.8%	9.6%
BTC	17.6%	28.5%	16.6%	33.8%
All other	31.4%	27.2%	35.5%	30.9%

Source: Data submitted to CRC

The situation of the wholesale leased lines was identical. The share of all remaining players increased, both by number of lines (by 4.1 percentage points) and by revenue (by 3.7 percentage points), thus occupying a growing market share compared to the three major undertakings.

Number of wholesale and retail leased lines

The total number of wholesale and retail leased lines provided continued to decrease, and the decline registered in 2018 year-on-year was by 17.9%. Although next-generation networks demand a growing volume of transmission medium and the fact that the leased line is exceptionally profitable in the presence of large traffic volumes, the consumer demand shifts towards a demand for new access products ensuring the required, and even higher, transmission quality, flexibility and adaptability with a view to the individual requirements, at a better price.



Source: Data submitted to CRC

Figure 14

The breakdown of leased lines is displayed in Figure 14. Due to the significant reduction in the number of wholesale leased lines compared to the year before (by 21.6%), an increase of 2.5 percentage points in the share of retail leased lines was registered in 2018, at the expense of the share of wholesale lines. The relative share of wholesale international leased lines did not change significantly.

Figures 15 and 16 present the distribution of the number of retail and wholesale leased lines provided for the period 2016 – 2018 by type of interface.

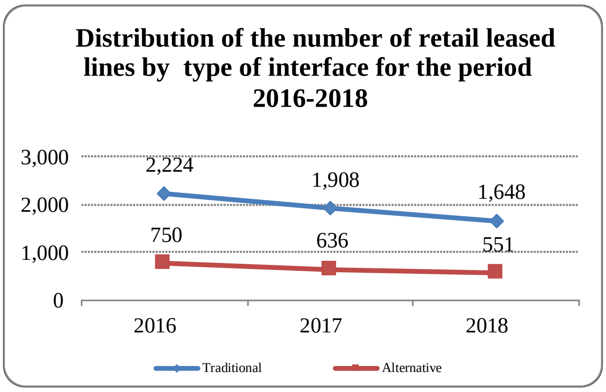


Figure 15

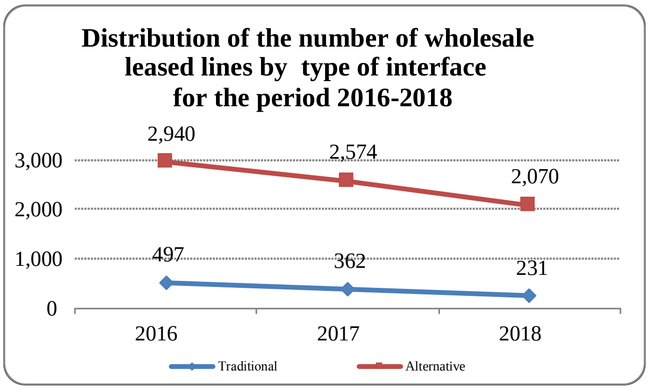


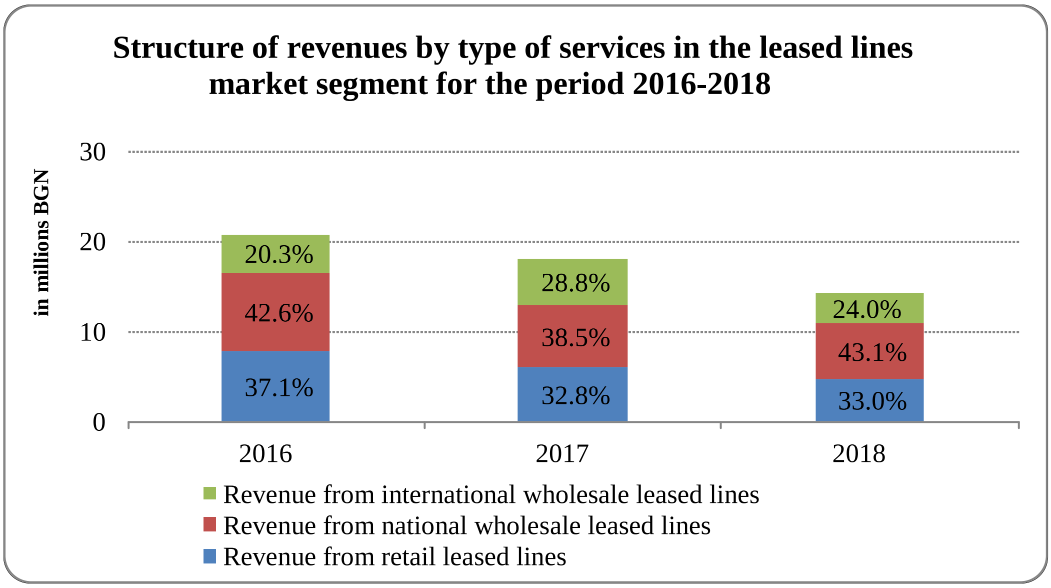
Figure 16

Source: Data submitted to CRC

The total decline in retail leased lines made up 13.6% in 2018, with traditional and alternative lines decreasing at nearly equal rates - by 13.6% and 13.4%, respectively. The reported drop in the number of wholesale leased lines was mainly the result of the drastic decline of 36.2% in the number of traditional wholesale lines. The number of wholesale alternative leased lines was down by 19.6%.

Revenue from leased lines

Figure 17 presents the structure of revenue generated from the provision of leased lines services (wholesale and retail) for the period 2016 -2018.



Source: Data submitted to CRC

Figure 17

The decline in the number of leased lines resulted in decreased revenue in the market segment. Figure 17 presents data confirming the observed downward trend in revenue but also showing a change in the ratio between them. In 2018, a decrease in revenue from all types of leased lines was reported for the first time, with the most significant drop registered in revenue from international leased lines - by 34.4%. The largest share in revenue continued to be held by revenue from wholesale national leased lines - 43.1%, registering an increase of 4.6 percentage points in the share of these lines in the total volume of the segment on a one-year basis. In absolute value, revenue from national wholesale leased lines was down by 11.9%. Revenue from retail leased lines also reported a drop - by 20.9%, with the share of this revenue preserving its level from the year before. A decrease in revenue both in absolute and in relative value was registered in international wholesale leased lines.[26] The share occupied by them in the total segment volume was down to 24.0% and forms a decrease of 4.8 percentage points.

Summary

In 2018, the leased lines services segment confirmed the following trends observed in the preceding years:

- decline in the number of leased lines, especially in the wholesale leased lines. The greatest drop was registered by wholesale traditional lines;
- decline in the total volume of leased lines as a result both from the decreasing number of lines and from the trend observed in the recent years towards replacement of traditional by alternative leased lines which are provided with analogous parameters at prices, considerably lower than the traditional ones;

[26] Including revenue from national sections of international leased lines, but excluding revenue from sections outside the territory of the country.

- migration to new access products, much more profitable for the user, which completely satisfy the requirements of the next-generation networks and services.

4. Data transfer and Internet access

The upward development of Internet access and data transfer services in the country was preserved in 2018 as well. During the year, the total volume of revenue generated from services included in the data transfer and Internet access segment amounted to BGN 887.172 million, registering an increase of 18.2% compared to the previous year.[27]

Table 8 presents summarised information about the number of undertakings which provided services in this market segment in 2018 as well as about the number of their subscribers/users and the revenue generated from them.

Table 8

Number of undertakings, subscribers/users and revenue by type of Internet access and data transfer services provided in 2018

Service	Number of undertakings providing the service in 2018	Number of subscribers/users as of 31.12.2018		Revenue (in millions BGN, excl. VAT	
		Total [1]	incl. bundled services subscribers	Total [2]	incl. revenue from bundled services
1. Retail Internet access and data transfer services	**651**	///	///	**850.038**	**361.346**
1.1. Internet access[3], incl.:	644	8,044,509	5,692,015	799.487	361.346
1.1.1. Fixed	643	1,903,815	670,607	276.242	65.390
1.1.2. Mobile [4]	5	6,220,041	5,100,755	523.246	295.955
1.2. Data transfer services	57	///	///	50.305	///
1.3. Other services (hosting, e-mail. etc.)	15	///	///	0.245	///
2. Wholesale services	**117**	///	///	**37.134**	///
2.1. Provision of capacity for Internet connectivity (Peering and Transit)	85	///	///	23.886	///
2.2. Data transfer services	16	///	///	4.584	///
2.3. Wholesale provision of Internet access via next generation networks (NGA)	49	///	///	5.986	///
2.4. Other wholesale services	9	///	///	2.678	///
Total	**679**	///	///	**887.172**	///

[1]Including bundled service subscribers

[2]Including revenue from bundled services

[3]The data on the total number of subscribers and revenue from Internet access services is based on the data received by CRC from 90.9% of the registered undertakings

[4]Mobile access via data cards or modems, bundled services with mobile Internet access included (including subscribers of data transfer plans, purchased in addition to voice plans via 3G and 4G UMTS/HSPA+/LTE mobile networks)

Source: Data submitted to CRC

[27] The data for 2017 have been updated.

Market players

As of 31.12.2018, the total number of undertakings registered at CRC for their intention to provide data transfer and/or Internet access services was 918, by 17 more than those registered the year before. The number of undertakings actually providing Internet access and data transfer services was 679,[28] also registering an increase since 2017[29] - by 19 undertakings. The undertakings providing retail services grew by 16 to reach 651 over a one-year period, while those providing wholesale services were up by 9, and so the number of undertakings providing wholesale services reached 117 in 2018.

In 2018, the major providers of fixed Internet access to end-users (retail service) were BTC, A1 and Bulsatcom.

Table 9

Market shares of undertakings providing retail fixed Internet access

Undertaking	2017		2018	
	Share based on number of fixed access subscribers	Share based on revenue from fixed access	Share based on number of fixed access subscribers	Share based on revenue from fixed access
BTC	26.8%	18.9%	27.1%	20.3%
A1 BULGARIA EAD	26.0%	18.6%	26.2%	19.7%
BULSATCOM EAD	8.7%	12.6%	8.9%	10.8%
All other	38.5%	49.9%	37.8%	49.2%

Source: Data submitted to CRC

As is evident from Table 9, the three largest undertakings to carry out activity on the retail market of fixed Internet access increased their market share by number of subscribers in 2018. The registered slight increase varied between 0.2 - 0.4 percentage points and did not lead to a change in the undertakings' positions in respect of market share by subscribers. The first two undertakings - BTC and A1 - retained their similar market shares by subscribers in 2018 as well. A growth was also registered in the market share of undertakings based on revenue from retail fixed Internet access, including the part of revenue generated from the provision of fixed Internet access bundled with other electronic communication services. BTC and A1 increased their market share based on revenue by 1.4 and 1.1 percentage points, respectively. Only the share of Bulsatcom reported a drop of 1.8 percentage points versus 2017. A slight decline of 0.7 percentage points was registered in the remaining undertakings, both based on subscribers of fixed access and on revenue.

In 2018, mobile Internet access was provided by all five mobile undertakings - A1, BTC, Bulsatcom, Telenor and Ti.Com. Table 10 presents their shares in the provision of mobile Internet in 2017 and 2018.

[28] Including undertakings that notified CRC for suspension of their activity in 2018 and declared revenue during the year.
[29] The data for 2017 have been updated.

Table 10

Market shares of undertakings providing retail mobile Internet access

Undertaking	2017		2018	
	Share based on number of mobile access subscribers	Share based on revenue from mobile access	Share based on number of mobile access subscribers	Share based on revenue from mobile access
BTC	35.8%	35.0%	34.8%	36.8%
A1 BULGARIA	29.6%	34.2%	32.8%	34.0%
TELENOR	34.5%	30.3%	32.4%	29.1%
BULSATCOM	0.04%	0.1%	0.03%	0.04%
MAX TELECOM	0.2%	0.4%	///	///
TI.COM*	0.0%	0.0%	0.03%	0.02%

*The undertaking did not provide mobile Internet access in 2017.

Source: Data submitted to CRC

As is evident from the data presented in the table, only the market share based on subscribers of A1 registered a growth compared to 2017 - by 3.2 percentage points. This was at the expense of the other two undertakings - BTC and Telenor - which registered a slight decline - by 1.0 and 2.1 percentage points, respectively. As for Bulsatcom, there was an insignificant decrease (0.01 percentage points). The said growth in the share of A1, calculated based on mobile access subscribers, was also manifested in the change in the undertakings' positions in 2018 versus 2017. In respect of market share based on revenue, including the part of revenue from the provision of mobile Internet bundled with other electronic communication services, only BTC reported an increase - by 1.8 percentage points. The remaining undertakings providing mobile Internet access registered a drop ranging from 0.06 to 1.2 percentage points based on revenue for 2018.

Subscribers of Internet access services

In 2018, the upward trend in the number of subscribers of Internet access services was preserved in the country. As of 31.12.2018, the total number of subscribers of retail Internet services (fixed and mobile Internet access) reached 8.045 million, up by 11.7% compared to the end of the previous year. The number of bundled services subscribers (with fixed and/or mobile Internet access included) also increased in the past year by 15.6% in absolute value to reach 5.692 million. In 2018, bundled services subscribers already made up 70.8% of the total number of subscribers, registering an increase of 2.4 percentage points year-on-year.

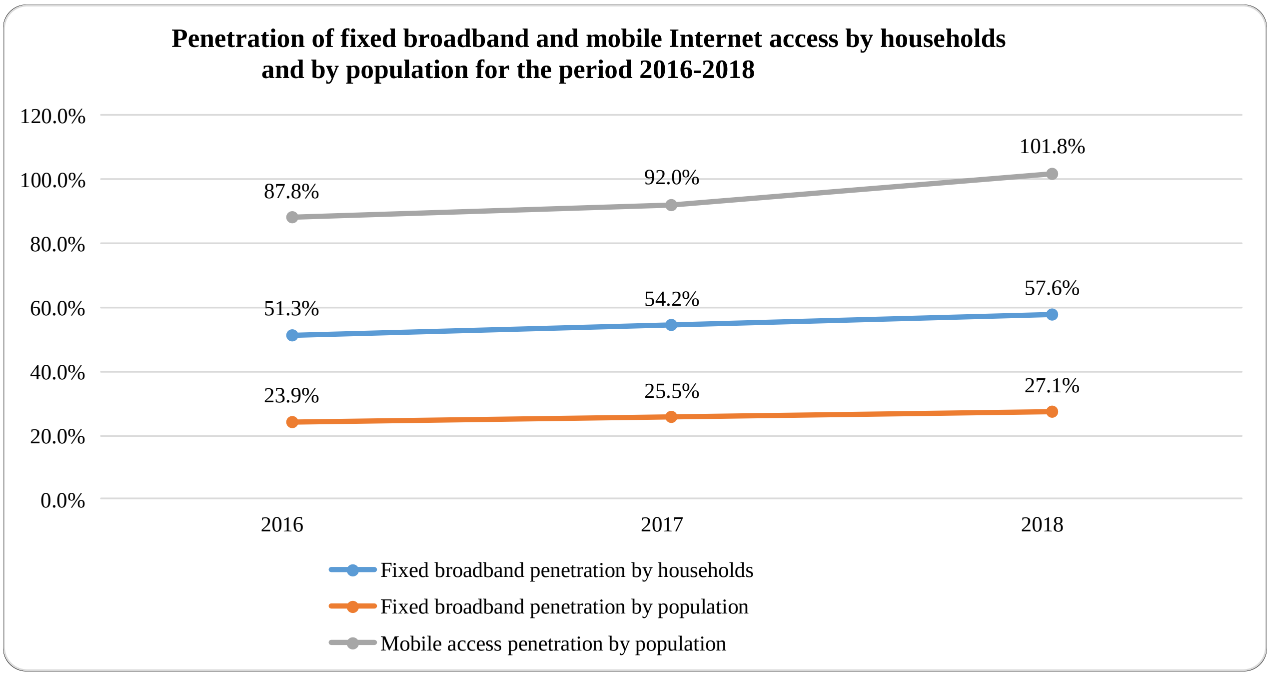
The number of subscribers of fixed Internet access (including services provided in a bundle)[30] preserved their steady growth rate. Over the past year, the number of subscribers rose by 5.6% to reach 1.904 million. The share of fixed access subscribers in the total number of Internet access subscribers continued to decrease, arriving at 23.7%, as it registered a decline of 1.3 percentage points over a one-year period.

[30] Including subscribers of ADSL, LAN, RLAN, CATV, FTTx, satellite access, fixed access via mobile network, as well as number of lines for retail Internet access via leased lines and dedicated access.

In 2018, the number of subscribers using mobile Internet access services[31] rose by 13.9% compared to the year before, reaching 6.220 million. Such increase was also due to the increase of 19.9% compared to the 2017 data on the number of subscribers of bundled Internet access which amounted to 5.101 million at the end of 2018. As a result of the reorientation of users towards the use of mobile Internet in a bundle, a decline of 7.1% since 2017 was reported in the number of subscribers using the service as a standalone service (via data cards and/or modem), and these subscribers dropped to 1.119 million at the end of 2018.

In 2018, mobile Internet access via LTE technology was provided by all five mobile operators in Bulgaria. The number of LTE subscribers for the last year reported another growth of 32.6% to reach 3.551 million as of 31.12.2018. The share of LTE subscribers was 57.1%, reporting a growth of 8.1 percentage points in relative value.

Figure 18 presents penetration[32] of fixed broadband Internet access by population and by households[33] as well as of mobile access[34] by population for the period 2016-2018.



Source: Data submitted to CRC

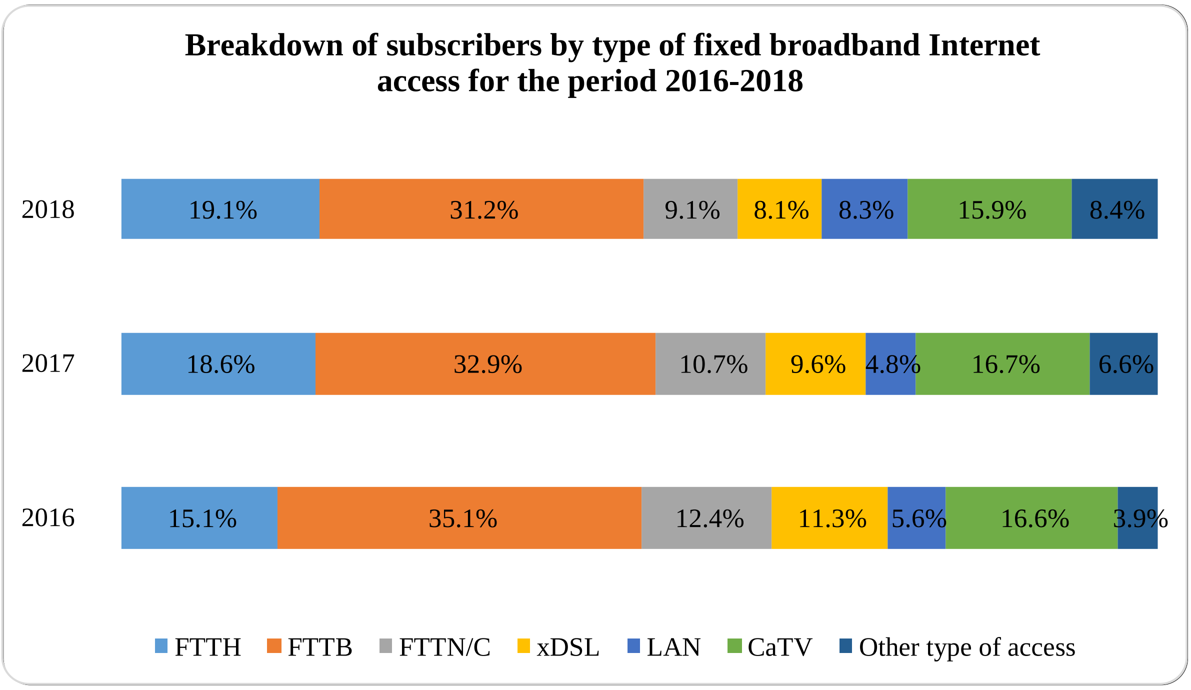
Figure 18

At the end of 2018, penetration of fixed broadband Internet access among households in the country was 57.6% compared to 54.2% at the end of the preceding year. The value of the "penetration of fixed broadband Internet access by population" indicator also increased to arrive at 27.1%, which represented a growth of 1.6 percentage points. As a result of the continued increase in the number of mobile Internet access subscribers, the "penetration of mobile Internet

[31] Standalone service via data cards or modems and bundled services with mobile Internet access included via 3G and 4G UMTS/HSPA+/LTE mobile networks (including data transfer packages, purchased in addition to voice plans).
[32] This indicator was calculated on the basis of data from the NSI assessment of the population in the country as of 31.12.2016, 31.12.2017 and 31.12.2018, as well as the 2011 census data concerning the number of households.
[33] Data on the number of residential subscribers at the end of the relevant year were used.
[34] These include: subscribers of bundled services with mobile Internet access included (including subscribers of data transfer bundles purchased in addition to voice plans), subscribers of standalone services via data cards or modems, as well as subscribers of mobile Internet access services provided without an individual subscription.

access by population" indicator also reported a growth of 9.8 percentage points compared to 2017, and for the period 2016-2018, this growth was 14.0 percentage points.

The breakdown of subscribers by type of fixed Internet access for the period 2016-2018 is shown in Figure 19.



Source: Data submitted to CRC

Figure 19

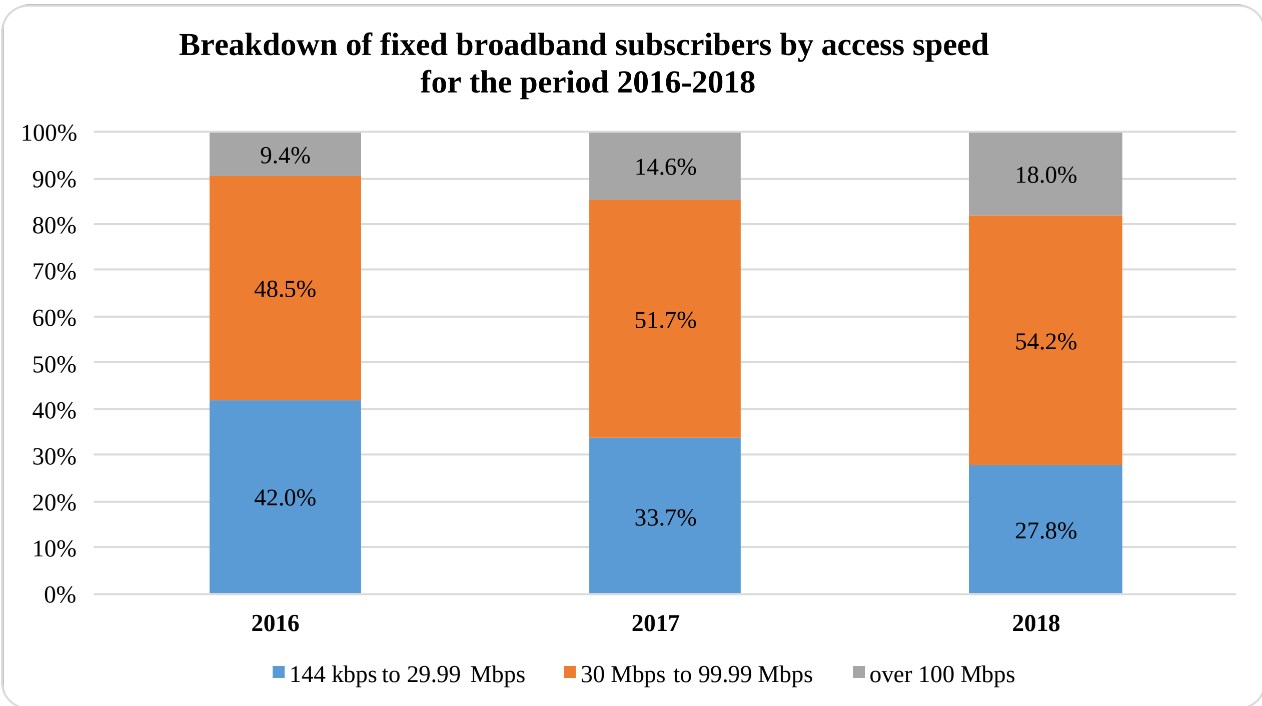
At the end of 2018, the majority of subscribers of fixed Internet access in Bulgaria continued to use access via fibre-optical networks (FTTH, FTTB and FTTN/C) – 59.4%. A slight drop of 2.8 percentage points was reported compared to 2017, however, for the period 2016-2018, the number of subscribers using access via fibre-optical networks grew by 6.0% in absolute value.

The share of CATV access subscribers (based on transmission and/or distribution of radio and TV programmes networks and DOCSIS standard) ranked next, as it remained relatively stable during the period 2016-2018. At the end of 2018, some 94.1% of the CATV subscribers used the DOCSIS 3.0 protocol, where the maximum speed to the subscriber may reach up to 200 Mbps, while at the end of 2016, the subscribers using DOCSIS 3.0 were 88.4% of the CATV access subscribers. The downward trend in the subscribers of xDSL access, provided only by BTC, continued in 2018 as well. Compared to the end of the previous year, the subscribers of that type of access decreased by 11.2%, and for the period 2016-2018, the drop was 19.6%. Migration of subscribers of BTC using optical ADSL access remained the same in 2018 as well, registering an increase of 12.1% in the number of BTC subscribers using fibre-optical networks over a one-year period. For the period 2016-2018, the growth was 29.7% in absolute value. In 2017, BTC began providing VDSL access in the country,[35] and at the end of 2018, the share of BTC subscribers who used VDSL in the total number of the undertaking's

[35] List under section 2.3 of Annex No. 2 to the Reference offer for conclusion of a contract for unbundled access to subscriber's line - https://www.vivacom.bg/bg/files/7119-spisyk-po-t-2-3-ot-prilojenie-2.pdf;

subscribers was 3.7% - by 2.5 percentage points more than in 2017. The share of the subscribers of LAN and other types of access in 2018, reached 8.3% and 8.4%, respectively. The most significant increase in the number of subscribers over the three-year period, as presented in Figure 19, was reported in the number of subscribers using other types of access (RLAN, fixed access via mobile networks, dial-up access, and satellite network access) - by 140.7%.

At the end of 2018, the subscribers of fixed broadband access using high-speed access via NGA networks[36] reached 83.3% of the total number of subscribers of fixed broadband Internet access. An increase of 2.0 percentage points, compared to the end of 2017, was registered. The upward development of the broadband Internet access via NGA networks had a positive effect on the speed of offered Internet services. The figure below presents the breakdown of the number of subscribers of fixed broadband Internet access according to the international download speed for the three-year period 2016-2018.[37]



Source: Data submitted to CRC

Figure 20

As a result of the increasing number of subscribers using optical connectivity and DOCSIS 3.0 cable access protocol, there was a growth in the number of subscribers using Internet access with minimum speed of 30 Mbps. At the end of 2018, more than half (54.2%) of the subscribers of fixed broadband access used high-speed access with international download speed from 30 Mbps to 99.99 Mbps, as their relative share increased by a total of 2.5 percentage points compared to the data for 2017 and by 5.7 percentage points compared to the end of 2016. The highest growth was observed in the share of users of ultra-high-speed access (over 100 Mbps), which rose by nearly 9 percentage points for the period 2016-2018. The number of

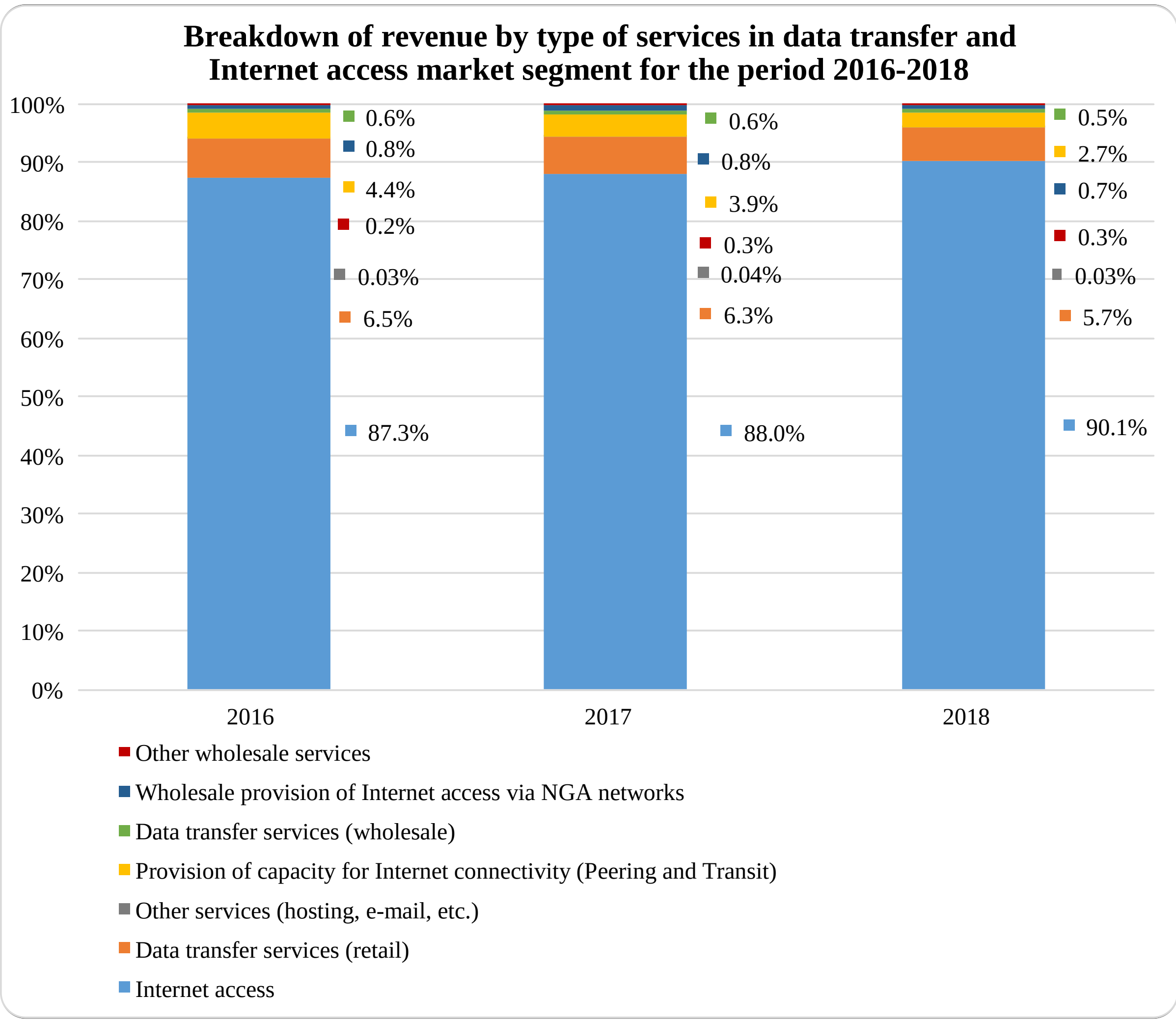
[36] Including optical (FTTB and FTTH), hybrid fibre-optical (FTTN/C with minimum speed of 30 Mbps), cable networks under the DOCSIS 3.0 standard, LAN and RLAN access with minimum speed of 30 Mbps, as well as fixed access via mobile networks with minimum speed of 30 Mbps.

[37] Not including subscribers using narrowband access due to their negligible number (0.003% of the total number of subscribers).

broadband access subscribers using speed of over 100 Mbps also grew in absolute value. Compared to 2017, 29.9% more subscribers used ultra-high-speed access (over 100 Mbps). An increase of 10.7% was observed in the number of subscribers using speed from 30 to 99.99 Mbps, while subscribers using speed up to 29.99 Mbps decreased by nearly 13%.

Revenue from data transfer and Internet access

In 2018, compared to 2017, revenues[38] from the data transfer and Internet access segment reached BGN 887.172 million. The registered increase of 18.2% compared to the 2017 data was due to the increased revenue from retail services which reported a growth of 20.0%. The total amount of revenue from retail services was BGN 850.038 million, of which BGN 799.487 million was revenue from Internet access services. Revenue from wholesale services amounted to BGN 37.134 million, registering a drop of 12.0% year-on-year. Figure 21 presents the breakdown of revenue generated for the period 2016-2018.[39]



Source: Data submitted to CRC

[38] Including revenues from standalone services for retail fixed and mobile Internet access, retail data transfer services and wholesale services (capacity for Internet connectivity, wholesale access services, wholesale provision of Internet access via next generation access networks (NGA), wholesale data transfer services and revenues from Internet access (fixed and mobile) provided bundled with other electronic communication services).

[39] The data for 2017 have been updated. The 2016 and 2017 data were recalculated to include the revenue from installation fees and monthly subscription fees for fixed and mobile Internet access bundled with other electronic communication services.

Figure 21

In 2018, no significant changes were observed in the total structure of revenue in the segment and it remained stable. The highest relative share (90.1%) continued to be held by revenue from retail Internet access services which registered a growth of 20.9% in absolute value in 2018, compared to 2017. This growth was the result of the significant increase of revenue from the provision of mobile Internet access compared to the year before. In 2018, versus 2017, the growth of the total revenue from the provision of mobile Internet access was significant – by 33.0%, and was by 24.1 percentage points higher than that in the previous one-year period. A considerable growth of 56.3% versus 2017 was reported in revenue from bundled services including mobile Internet access, while these services grew by over 80% for the period 2016-2018. The total revenue from the provision of fixed Internet access also registered a growth of 3.2%. This was mainly due to the increase in revenue from a standalone service[40] by 8.5%, at the expense of the provision of bundled services with fixed Internet access included which dropped by 10.9% versus 2017 and by 14.0% versus 2016.

Summary

No change was observed in the development trends of the data transfer and Internet access segment in 2018 versus 2017. The following was reported for yet another year:

- increase in the number of subscribers which is explained mainly with the growth in the number of subscribers with standalone mobile Internet access, as well as the number of subscribers using bundled services with fixed and/or mobile Internet access included;
- increase in the share of LTE subscribers in the total number of mobile Internet subscribers;
- continued increase in the share of subscribers using fixed high-speed and ultra-high-speed access within the total number of subscribers using fixed Internet access (as a result of migration to NGA networks);
- increase in the total volume of revenue in the segment due to the increased revenue from Internet access and mainly due to the increased revenue from bundled services with mobile Internet access included.

5. Transmission and/or distribution of radio and TV programmes services

In 2018, the volume of the "transmission and/or distribution of radio and TV programmes services" market segment reached BGN 403.914 million, registering a considerable growth of 16.3% since 2017.

Summarised information on the number of undertakings that provided transmission and/or distribution of radio and/or TV programmes services, the number of their subscribers/users, and on the volume of revenue generated from them, along with the structure of the segment, is presented in Table 11 and in Figure 19 below:

Table 11

[40] Including revenue from standalone Internet access, revenue from the sale of vouchers and cards, revenue from access via leased lines and dedicated access.

Number of undertakings, number of subscribers/users and revenue by type of transmission and/or distribution of radio and TV programmes services in the segment provided in 2018

Service	Number of undertakings providing the service in 2018	Number of subscribers/users as of 31.12.2018		Revenue (in millions BGN, excl. VAT)	
		Total [1]	incl. bundled services subscribers	Total [2]	incl. from bundled services
1. Retail distribution of radio and TV programmes[3]	**253**	**2,027,583**	**652,985**	**368.240**	**120.352**
1.1. Cable TV[4]	229	558,749	341,936	103.289	63.022
1.2. Satellite TV[4]	3	1,027,743	114,429	177.101	21.090
1.3. IPTV[4]	32	441,091	196,620	87.849	36.239
2. Terrestrial broadcasting of radio and TV programmes	**63**	///	///	///	///
3. Provision of transmission/distribution of radio and TV programmes	**12**	**175**	**///**	**35.673**	///
3.1. Transmission of radio and TV programmes services	6	65	///	6.838	///
3.2. Distribution of radio and TV programmes services, including wholesale IPTV and/or DVB-C service	8	110	///	28.836	///
Total	**///**	**///**	**///**	**403.914**	**///**

[1] Including bundled service subscribers.

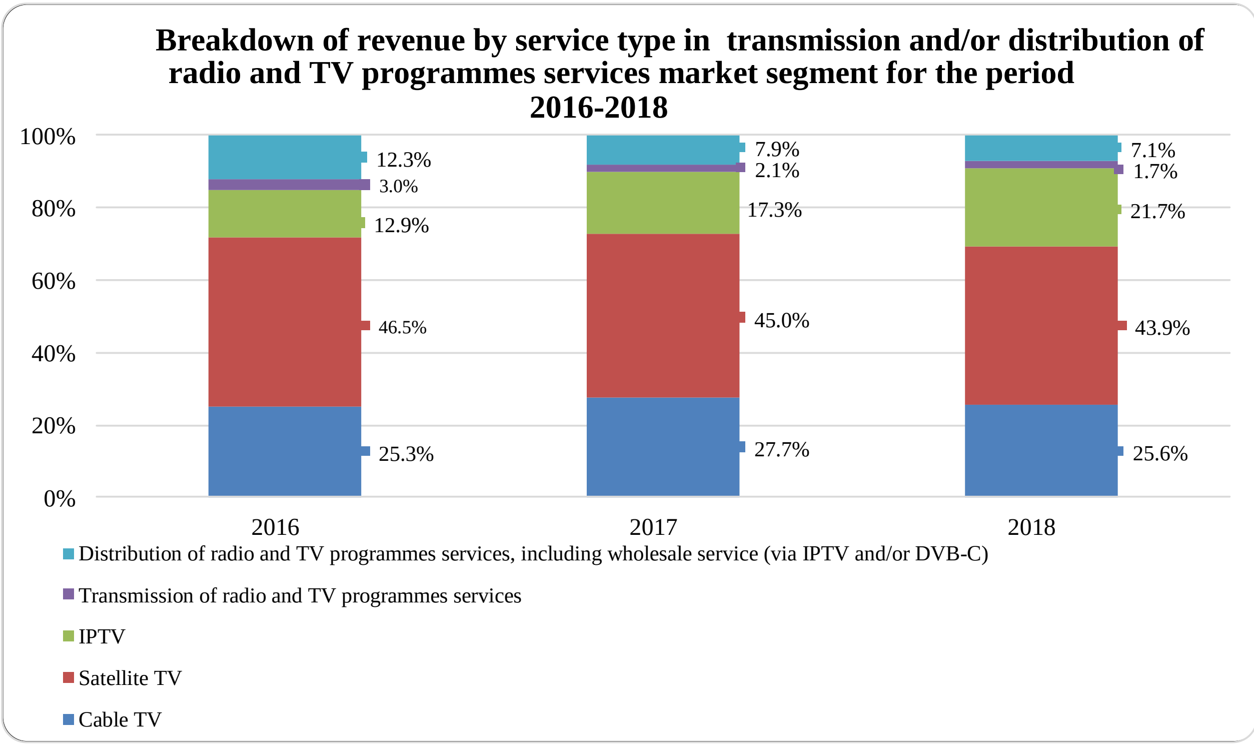
[2] Including revenue from bundled services.

[3] Data on the total number of subscribers and revenue from distribution of radio and TV programmes services are valid as of 17.05.2019 based on information received from 90.9% of the registered undertakings.

[4] Revenue from bundled services y TV platforms is measured based on the breakdown of bundled service subscribers by platforms.

Source: Data submitted to CRC

According to the data submitted by undertakings, there was a growth in revenue from all services in the segment during the one-year period under review, with the exception of wholesale transmission of radio and TV programmes services. The largest growth was observed in revenue from retail IPTV – 46.1%. Revenue from cable and satellite television grew by 7.2% and 13.4%, respectively, while wholesale distribution of radio and television programmes services, including wholesale service via IPTV and/or DVB-C, rose by 5.6% compared to the previous reporting period. A drop was only reported in revenue from wholesale radio and television programmes services, down by 7.5% compared to the 2017 data.



Source: Data submitted to CRC

Figure 22

In 2018, the largest share of the total volume of the segment (91.2%) continued to be occupied by revenue from the provision of retail radio and TV programmes services (Figure 22): cable television, satellite television and IPTV. For yet another year, revenue from satellite television held the highest share in the total segment volume, as this share dropped by 1.1 percentage points in relative value for a one-year period to arrive at 43.9%, followed by the share of revenue from cable television which fell by 2.1 percentage points over one year to reach 25.6% in 2018. The share of revenue from the provision of IP television registered the most significant growth in relative value compared to 2017 - 4.4 percentage points, reaching 21.7% of the total segment volume. The smallest share was held by revenue from wholesale services - 7.1% from distribution of radio and TV programmes services, including wholesale service via IPTV and/or DVB-C, and 1.7% from wholesale transmission of radio and TV programmes services, respectively.

5.1. Retail distribution of radio and TV programmes

Market players

The number of undertakings providing services related to retail distribution of radio and TV programmes services decreased by 2.4% to arrive at 253[41] in 2018 (Table 11), as the observed downward trend reported in the last several years continued.

As of 31.12.2018, the total number of undertakings registered in CRC for the provision of cable television was 308, as the number of undertakings that actually provided this service was 229 (by 7 less than in 2017). For yet another year, the number of cable operators dropped as

[41] Including undertakings that notified CRC for suspension of their activity in 2018 and declared revenue during the year.

a result of competition pressure exercised by the largest players in the market segment providing satellite and IP television.

As of 31.12.2018, the undertakings that provided satellite television in Bulgaria remained the same compared to the previous years: Bulsatcom, BTC and A1.

As of 31.12.2018, 139 undertakings were registered for their intention to provide IPTV, as the number of those that actually provided this service grew by five to reach 32 for a one-year period. Another 7 declared their intention to start offering the service in 2019.

The table below presents the relative shares of the first three undertakings, calculated based on the number of subscribers and the revenue from the provision of retail television services, including the part of revenue from bundled services with television included, for the period 2017-2018.

Table 12

Market shares of undertakings providing retail pay TV for the period 2017-2018

Undertaking	2017		2018	
	Share based on subscribers	Share based on revenue	Share based on subscribers	Share based on revenue
BULSATCOM EAD	34.3%	36.5%	39.1%	39.9%
A1 BULGARIA EAD	25.8%	21.1%	24.1%	24.9%
BTC	24.5%	22.5%	23.1%	21.4%
All other	15.4%	19.8%	13.6%	13.8%

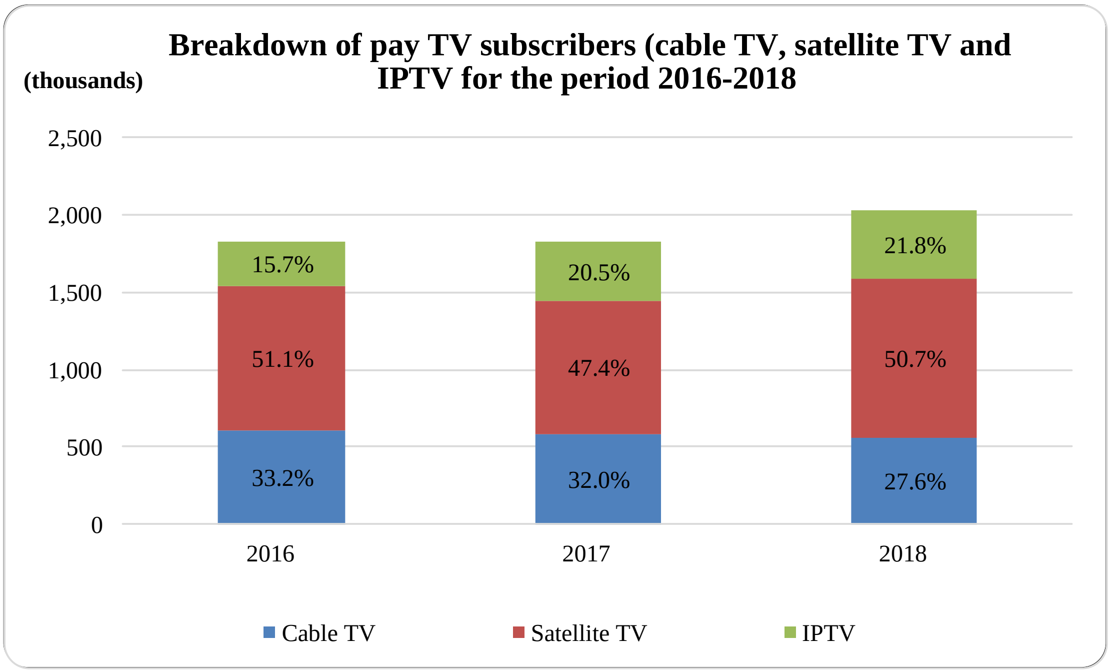
Source: Data submitted to CRC

As is evident from the data presented in Table 12, the positions of the largest undertakings in terms of their shares in the total number of subscribers of retail television and in the total volume of revenue from its provision (including the part of revenue from bundled services with television included) were preserved in 2018 as well. The highest relative share, both in terms of number of subscribers and revenue, was held by Bulsatcom, followed by A1 and BTC. The first undertaking increased its share by both indicators over the one-year period by nearly 5 percentage points based on subscribers and by 3.4 percentage points based on revenue, respectively, which indicates a strengthening of its market positions ahead of its main competitors. The share of A1 based on number of subscribers declined by 1.7 percentage points, yet it grew by 3.8 percentage points based on revenue, occupying relatively similar shares of subscribers and revenue - 24.1% and 24.9%, respectively. The change reported by BTC versus 2017 was a negative value. The shares of the said undertaking are decreasing, covering 23.1% of the total number of subscribers and 21.4% of the revenue. Due to the opposing trends of change in the shares of A1 and BTC based on revenue, as compared to 2017, the latter was replaced by A1 from the position it held the year before based on that indicator. Notwithstanding the varying changes in the shares of the largest undertakings in the market of retail distribution of radio and TV programmes during the one-year period under review, their aggregate market share grew both based on number of subscribers (by 1.8 percentage points) and revenue (by 6.0 percentage points), at the expense of all other players in the market segment.

Subscribers of retail distribution of radio and TV programmes services

As of 31.12.2018, the number of retail pay TV subscribers exceeded the 2-million threshold for the first time, reaching 2.03 million subscribers[42], as this indicator registered a considerable growth of 11.3% compared to the year before. The registered growth in the number of subscribers has been the highest since 2011.

The figure below presents the shares of subscribers by platforms in the total number of pay TV subscribers for the period 2016-2018.



Source: Data submitted to CRC

Figure 23

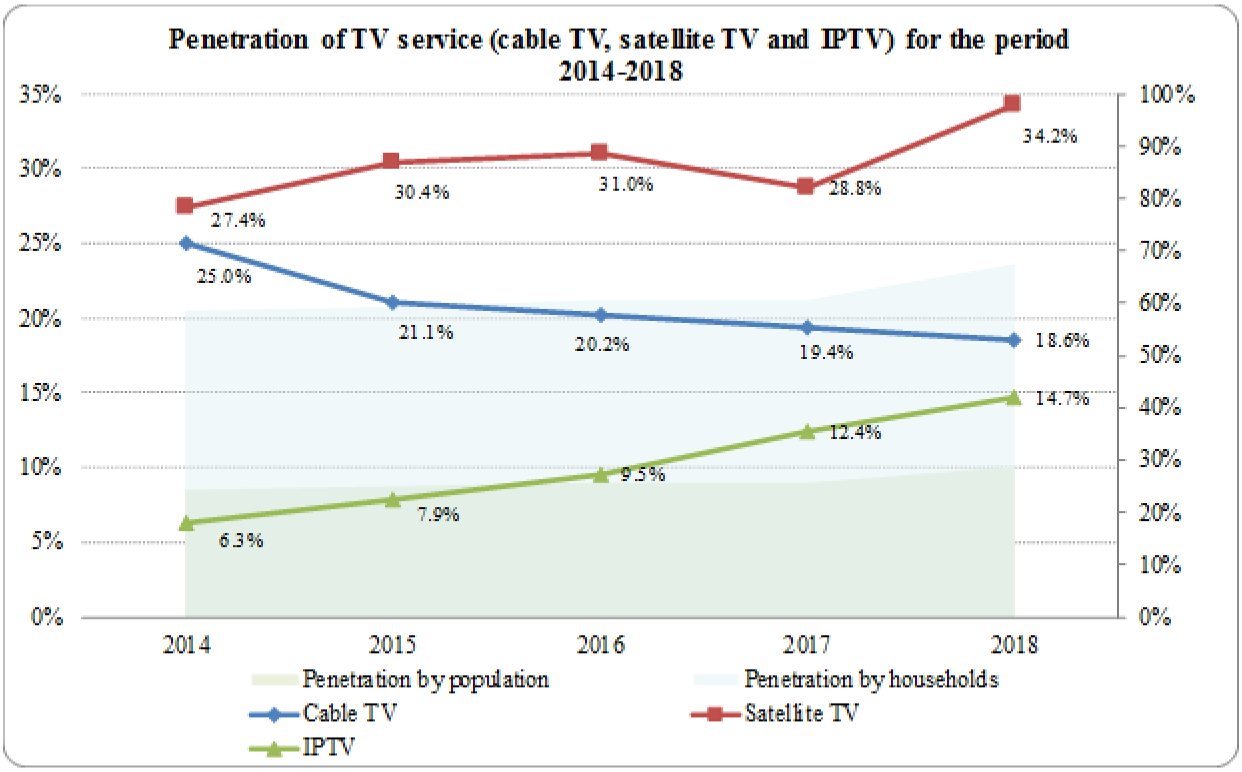
For the first year, the most considerable growth was registered in the number of satellite TV subscribers. In 2018, compared to the previous year, the growth of this indicator was 18.9%, and the number of satellite TV subscribers reached 1.028 million making up over half the total number of pay TV subscribers in the country as of 31.12.2018 (Figure 23).

The number of IPTV subscribers as well as their relative share in the total number of pay TV subscribers continued to grow in 2018. Even though their number increased at nearly twice lower rate as compared to the previous one-year period, the share of subscribers rose by 1.3 percentage points to reach 21.8% as of 31.12.2018.

The downward trend in the number of cable TV subscribers, which was observed in the last several years, continued in the present reporting period as well. Compared to 2017, the subscribers of cable TV dropped by 4.3%, as their share in the total number of pay TV subscribers followed the reported downward trend and fell by 4.4 percentage points down to 27.6%. The difference between the number of IPTV and cable TV subscribers is getting smaller and smaller in absolute value, which, in turn, would lead to similarity between the two platforms in respect of the total number of pay TV subscribers in a short- to medium-term future period.

[42] Including subscribers of bundled services who amounted to 652,985 as of 31.12.2018.

The growth in the total number of pay TV subscribers also reflected on its penetration[43] among households. The highest growth in penetration was registered since 2011 – by 6.9 percentage points over a one-year period, to reach 67.5% as of 31.12.2018 (to compare with, this indicator was 60.6% at the end of 2017). Penetration of cable TV was the only one to register a drop (0.8 percentage points) against 2017, as its share amounted to 18.6% at the end of 2018. Penetration of satellite and IPTV rose by 5.4 and 2.3 percentage points, respectively, reaching 34.2% and 14.7% (Figure 24). Penetration of pay TV among the Bulgarian population[44] continued to grow, as it reached 3.1 percentage points in 2018 versus 2017, arriving at 29%.



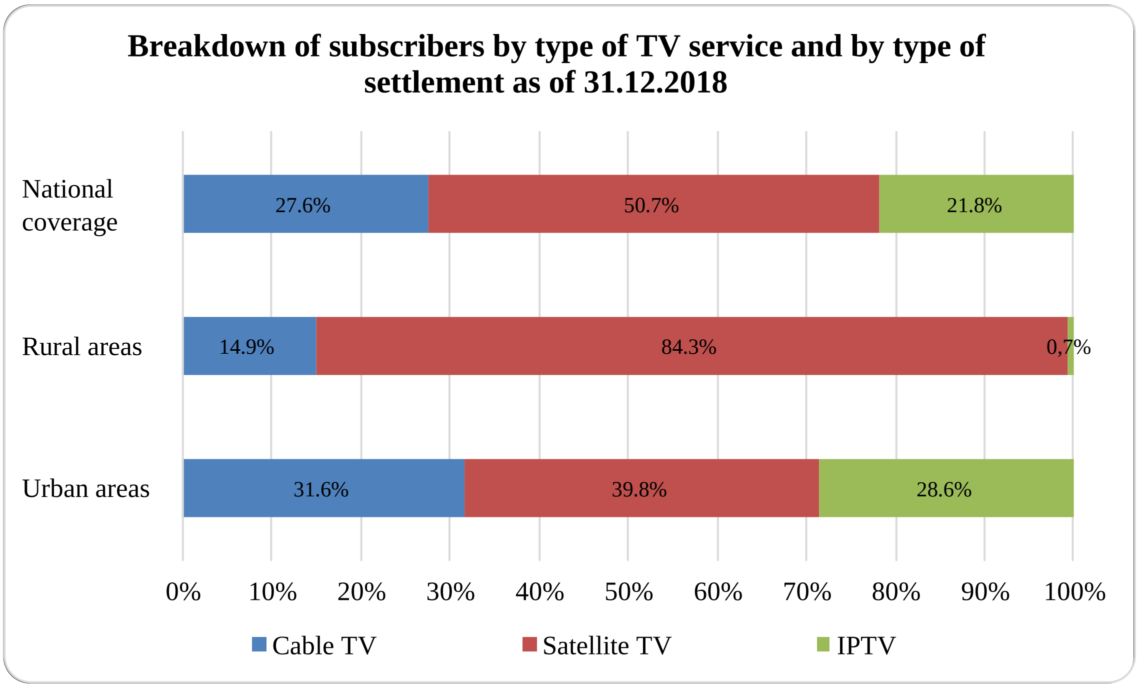
Source: Data submitted to CRC

Figure 24

Figure 25 displays the breakdown of subscribers of pay TV according to the settlement where they use this service as of 31.12.2018.

[43] This indicator was calculated as the ratio between the number of subscribers of pay TV as of 31.12.2018 and the number of households according to the last official census carried out by NSI in 2011 (3,005,589 - ordinary households).

[44] This indicator was calculated as the ratio between the total number of subscribers of pay TV as of 31.12.2018 and the number of population as of 31.12.2018, according to NSI data (population by districts, municipalities, place of residence and sex: http://www.nsi.bg/bg/node/2972)

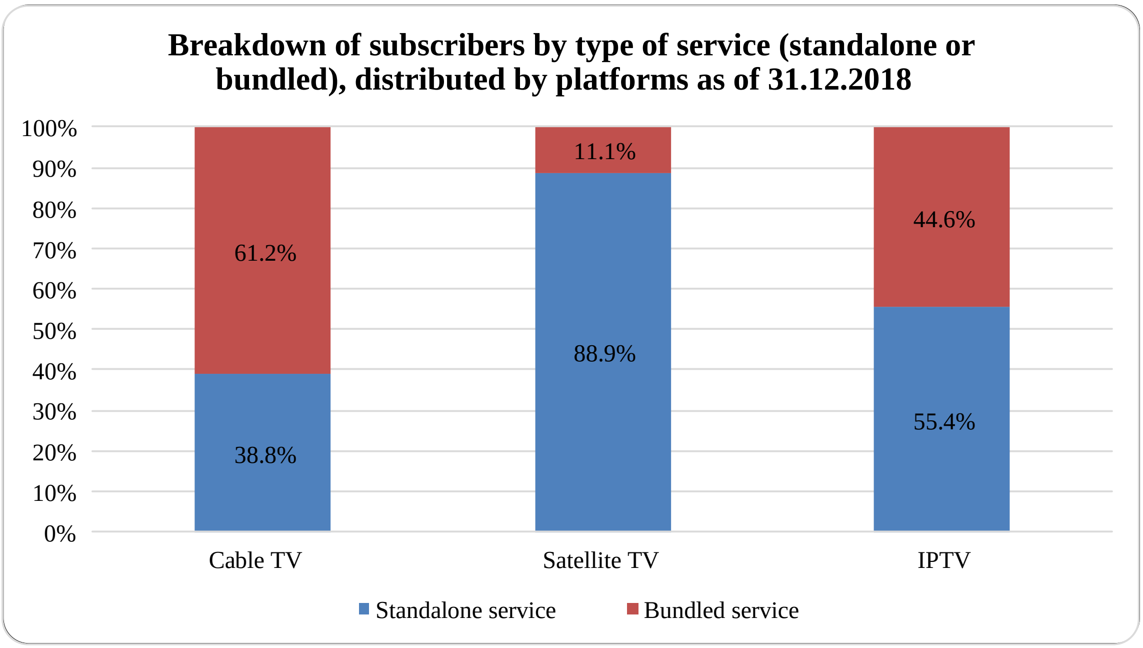


Source: Data submitted to CRC

Figure 25

For yet another year, the share of satellite TV subscribers in rural areas was twice as much as the shares of the remaining two platforms, as it grew by 2.7 percentage points since 2017, at the expense of the share of cable TV subscribers. In many rural areas, there is no subscribers' network built, and satellite remains the only alternative for access to pay TV. Nevertheless, at the end of 2018, the number of IPTV subscribers in rural areas grew 3 times which also reflected on its share - 0.7%, registering a growth of half percentage point for a one-year period. On the other hand, cable operators and IPTV providers focused their efforts mainly on attracting customers in urban areas (99.2% of IPTV subscribers and 86.8% of cable TV subscribers were in the urban areas), due to the expected higher return on their investments in the building of infrastructure to the end-user. This is evident from the breakdown of subscribers in urban areas (Figure 22). The subscribers of all three platforms held relatively similar shares. In contrast to the shares of subscribers of IPTV and satellite television in urban areas, which grew by 1.6 and 3.3 percentage points, respectively, that of cable TV subscribers dropped in line with the total decline observed at national level, as it covered 31.6% of the total number of pay TV subscribers in urban areas.

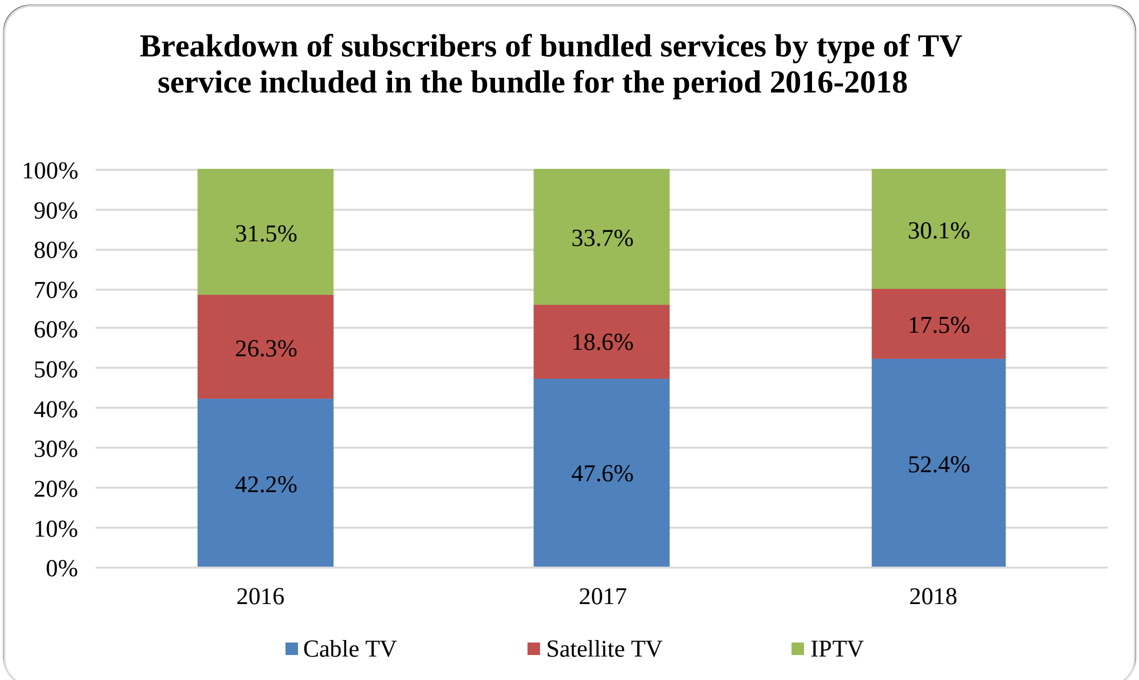
The number of subscribers of bundled services with television included registered another drop - by 8.7% in 2018 compared to the year before. The figure below shows the share of subscribers of bundled services with television included in the total number of subscribers distributed by platforms, as of 31.12.2018.



Source: Data submitted to CRC

Figure 26

In the last several years, the breakdown of subscribers by type of service - standalone or bundled - has changed considerably in two of the television platforms. Compared to the end of 2016, the shares of bundled services subscribers, with satellite and IPTV included, reduced by half, while compared to 2017, they dropped by 4.3 and 19.9 percentage points to reach 11.1% and 44.6%, respectively, of the total number of subscribers of the respective platform as of 31.12.2018 (Figure 23). For the same period (as compared to 2016), the relative share of subscribers of bundled services with cable television included increased by nearly 8 percentage points and by 2.9 percentage points versus 2017, reaching 61.2%.



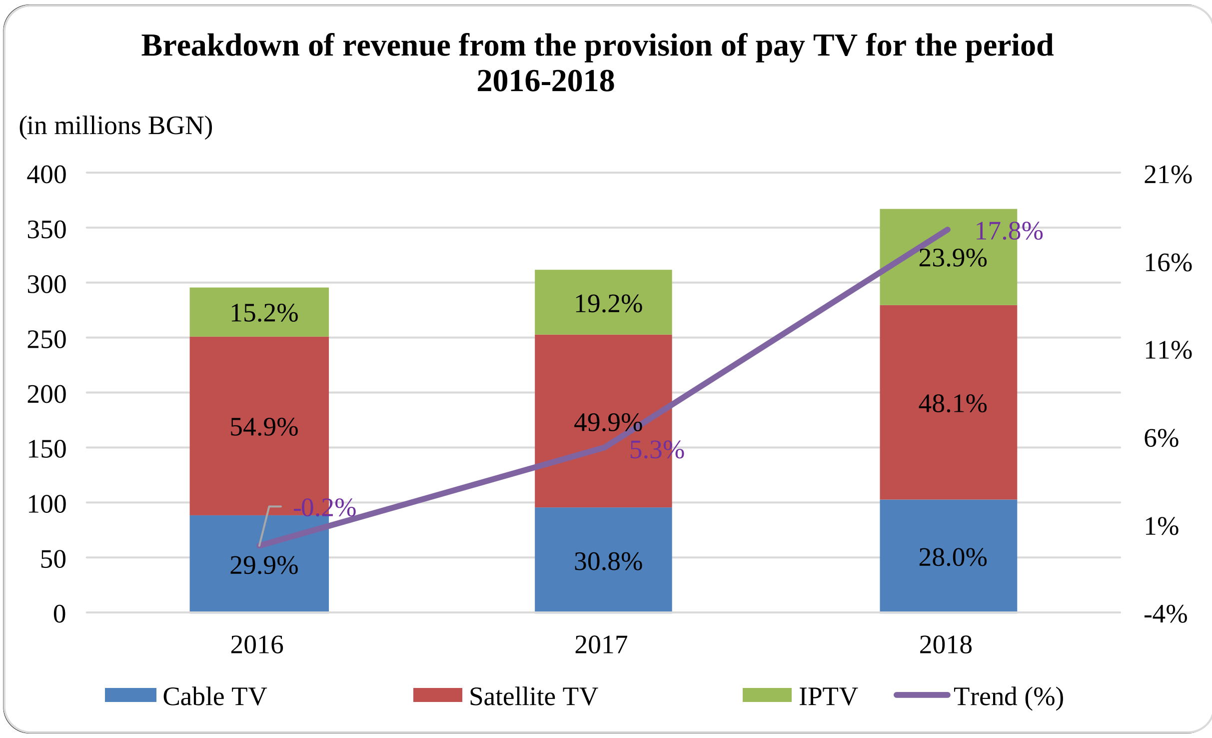
Source: Data submitted to CRC

Figure 27

The growth in the shares of bundled services subscribers with cable television, which was observed in the previous year, continued in 2018 as well. Over the one-year period, it rose by 4.8 percentage points to cover over half the bundled services subscribers with television included as of 31.12.2018 – 52.4% (Figure 27). The increase in the share of bundles with cable television included was rather due to the reported drop in the number of bundled services subscribers with satellite television and IPTV included in the past year than to the growth in the number of bundled services subscribers with cable television included. In 2018 versus 2017, the number of bundled services subscribers with satellite television included was down by 14% in absolute value (or by 18.6 thousand subscribers), whereas their share in the total number of bundled services subscribers with television included decreased by 1.1 percentage points down to 17.5%. For the first time, a decline was also registered in the number of bundled services subscribers with IPTV included – by 18.5%, which had a negative effect on its share in the total number year-on-year, down by 3.6 percentage points to 30.1%.

Revenue from retail distribution of radio and TV programmes services

The volume of total revenue, including revenue from bundled services with pay TV included, amounted to BGN 368.240 million in 2018, up by nearly 18% compared to 2017 (Figure 25). The figure below presents the breakdown of revenue from the provision of pay TV, including revenue from bundled services with television included, in the total volume of the retail segment.



Note: *The presented data on revenue from cable television, satellite television and IPTV include revenue from bundled services with television included, calculated based on the breakdown of bundled services subscribers with television included, by platforms.*

Source: Data submitted to CRC

Figure 28

Revenue from all three television platforms registered a growth in 2018 compared to the year before. The most significant growth was reported in revenue from IPTV which increased by 46.1% for a one-year period, and their share in the total volume of the retail market segment grew by 4.7 percentage points to arrive at 23.9%. Despite the registered increase in the revenue from satellite television - by 13.4% since the year before, their share in the total volume of the market segment dropped by 1.8 percentage points, yet it remained the highest - 48.1%. A growth in absolute value was also reported in revenue from the provision of cable television - by 7.2% versus 2017, as their share in the total volume of the market segment was down by 2.8 percentage points to 28% (Figure 28).

Revenue from the provision of bundled services with television included constituted almost 33% of the total volume of the retail segment. Revenue from standalone IPTV and satellite television manifested an upward trend, like those presented above in respect of total revenue by platforms, up by 64.1% and 11.2%, respectively, while revenue from standalone cable television decreased by 16% compared to 2017. This decline was due to the reduced consumption of the standalone service at the expense of the bundled one, as revenue generated from bundled services with cable television included are capable of compensating the drop of the standalone service in the total revenue from the television platform for the one-year period under review.

5.2. Wholesale transmission and/or distribution of radio and TV programmes and IPTV

In 2018, the total number of undertakings providing wholesale transmission and/or distribution of radio and television programmes services, including via IPTV and/or DVB-C, was 12.

A detailed information on the number of undertakings which in 2018 provided wholesale transmission and/or distribution of radio and television programmes services, the number of users of these services and the volume of revenues generated from them, as well as on the structure of the above services' market, is displayed in Table 13 and in Figure 26 below:

Table 13

Number of undertakings, number of subscribers/users and revenue from the provision of wholesale transmission and/or distribution of radio and TV programmes services in 2018

Types of wholesale transmission and distribution of radio and television programmes services	Number of undertakings providing the service in 2018	Number of subscribers/ users of the service as of 31.12.2018	Revenue from the service in 2018 (in millions BGN, excl. VAT)
1.1. Transmission of radio and TV programmes services, including:	**6**	**65**	**6.838**
1.1.1. Terrestrial radio-relay transmission	1	///	
1.1.2. Satellite trnasmission	4	20	6.396
1.1.3. Other type of transmission	2	///	
1.2. Distribution of radio and TV programmes services, including wholesale IPTV provided to other undertakings, including:	**6**	**74**	**26.836**
1.2.1. Terrestrial broadcasting	5	41	22.593
1.2.2. Satellite broadcasting	2	///	
1.3. Wholesale TV service (via IPTV and/or DVB-C) provided to other undertakings for resale purposes	2		
Total	**12**	**175**	**35.673**

Source: Data submitted to CRC

In 2018, the number of undertakings providing transmission of radio and TV programmes services remained unchanged compared to 2017 - six. The number of subscribers of these services grew by over 12% compared to the previous year.

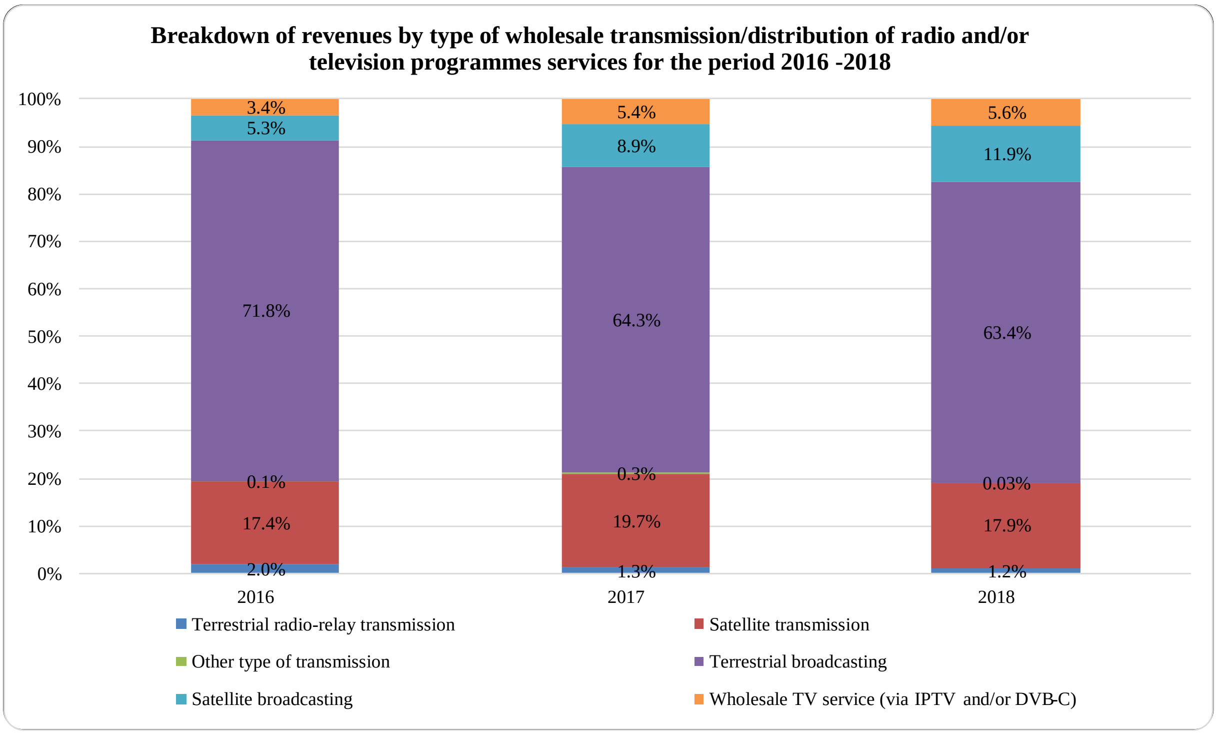
Compared to 2017, the number of undertakings providing distribution of radio and television programmes services decreased by one to arrive at six, while the subscribers of this type of services remained unchanged over a one-year period[45]. Wholesale television services via IPTV and/or DVB-C in 2018 were provided by two undertakings only[46].

Revenue generated from the provision of wholesale transmission and distribution of radio and television programmes services amounted to BGN 35.673 million and, unlike the previous one-year period when a considerable drop was reported, in 2018, they registered an increase of 2.8% compared to the previous year. This growth was the result of an increase in the absolute volume of revenue from wholesale distribution of radio and television programmes and from provision of wholesale television services via IPTV and/or DVB-C - by 5.6% and 6.1%, respectively. Revenue from transmission of radio and television programmes services continued to drop in 2018 as well, registering a decline of 7.5% in absolute value year-on-year.

A growth was observed in the revenue from services included in the main group of distribution of radio and television programmes - by 37% for satellite broadcasting and by 1.2% for terrestrial broadcasting, respectively, while revenue from services included in the main group of transmission of radio and television programmes, namely terrestrial radio relay

[45] Table 13 has been restructured as compared to the one presented in the Annual Report of CRC for 2017. The total number of undertakings under item 1.2 in Table 13 in the current report covers the undertakings under items 1.2.1 and 1.2.2 (no duplication) and does not include undertakings under item 1.3.
[46]Mitko.Com EOOD and Viora Interaktiv OOD

transmission, satellite transmission and other types of transmission (optical), registered a decline by 1.2%, 6.5% and 89.3%, respectively.



Source: Data submitted to CRC

Figure 29

The data in Figure 29 show that in 2018 the largest share in the revenue from the provision of wholesale transmission and distribution of radio and TV programmes services was again held by terrestrial broadcasting – 63.4%, while the smallest share (0.03%) was occupied by wholesale services for the provision of other types of transmission (optical) of radio and TV programmes.

5.3. Terrestrial broadcasting of radio programmes – VHF broadcasting

At the end of 2018, 61 undertakings were registered at CRC to provide services for terrestrial broadcasting of radio programmes, as 59 of these undertakings were active.

As of 31.12.2018, two undertakings remained with national coverage – Bulgarian National Radio and Darik Radio AD.

Summary

In 2018, the following changes were observed in the “transmission and/or distribution of radio and TV programmes services" segment versus 2017:

- Increase in the total volume of revenue from the segment, mainly as a result of the reported increase in revenue from retail distribution of radio and TV programmes;

- Growth in the number of retail subscribers, as a result of which the penetration of the TV service among households increased;

- Drop in the consumption of bundled services with retail television included;
- Increase in the number of subscribers and revenue from wholesale transmission and/or distribution of radio and TV programmes services.

6. Prospects for development of the Bulgarian electronic communications market

The electronic communications market in Bulgaria continued to be in line with the development trends of the European market. The high consumer demands in respect of quality and variety of services offered are giving rise to an increased competition among undertakings providing electronic communication services. Apart from investing in the deployment of NGA networks, undertakings are focusing their attention on the offering of digital services and innovations to meet the requirements of high and ultra-high speed, storage space, connection security, information protection and mobility of devices. Hybrid services combining traditional electronic communication services and machine-to-machine communications, related content, Internet of things (IoT), etc. are increasingly used. It is expected that the trends observed in 2018 will be preserved in 2019 as well, namely:

- Strong competition among the major undertakings providing mobile telephony service in the country and growth in the amount of total consumption of mobile telephony service and of roaming minutes actually consumed by subscribers of the Bulgarian undertakings;

- Increase in the number of mobile Internet subscribers using LTE technology due to the greater coverage of LTE networks and the increased competition in this segment towards the offering of new and increasingly diverse services – cloud space for data storage, television content, etc.;

- Growth in the number of subscribers using high-speed and ultra-high-speed access due to the migration to NGA networks providing a wide range of possibilities - delivery of high-definition content (video or television), support of high-speed applications, provision of symmetrical broadband connections, etc.;

- Decrease in the number of subscribers of and revenue from fixed telephony service provided standalone or bundled with other services as a result of the decreasing interest of users in that service;

- Increase of the subscribers and revenue from IPTV and preservation of the trend towards redistribution of pay TV subscribers among platforms in urban and rural areas;

- Shrinking in the “leased lines” segment due to the offering of alternative access products in the market which ensure all functional characteristics of the “leased lines” service and, at the same time, are better adaptable to the customer’s individual needs and demands;

- Growth in the bundled services subscribers and revenue, and preservation of the preference for bundled services made up of two electronic communication services (double-play bundles) and especially for bundles with mobile voice and mobile Internet included. Undertakings will continue their efforts to improve the quality of services offered by including additional services to the traditional communication services - the so-called “digital services” and content services.

7. Provision of the universal service

7.1. Degree of satisfaction from the universal service provision

As of 31.12.2018, the undertaking obliged to provide the universal service[47] – BTC –

[47] Pursuant to § 7 of the Law on Electronic Communications.

ensured 81% coverage measured by the number of territorial units. Compared to 2017, an insignificant drop in coverage (by 1 percentage point) was registered, as a result of the faster rate of decrease in the number of territorial units where fixed telephony service is provided as compared to the rate of decrease in the number of settlements as of 31.12.2018. The above coverage includes settlements and settlement formations (resorts, etc.), which are included in the Unified Classification of Administrative-Territorial and Territorial Units.[48]

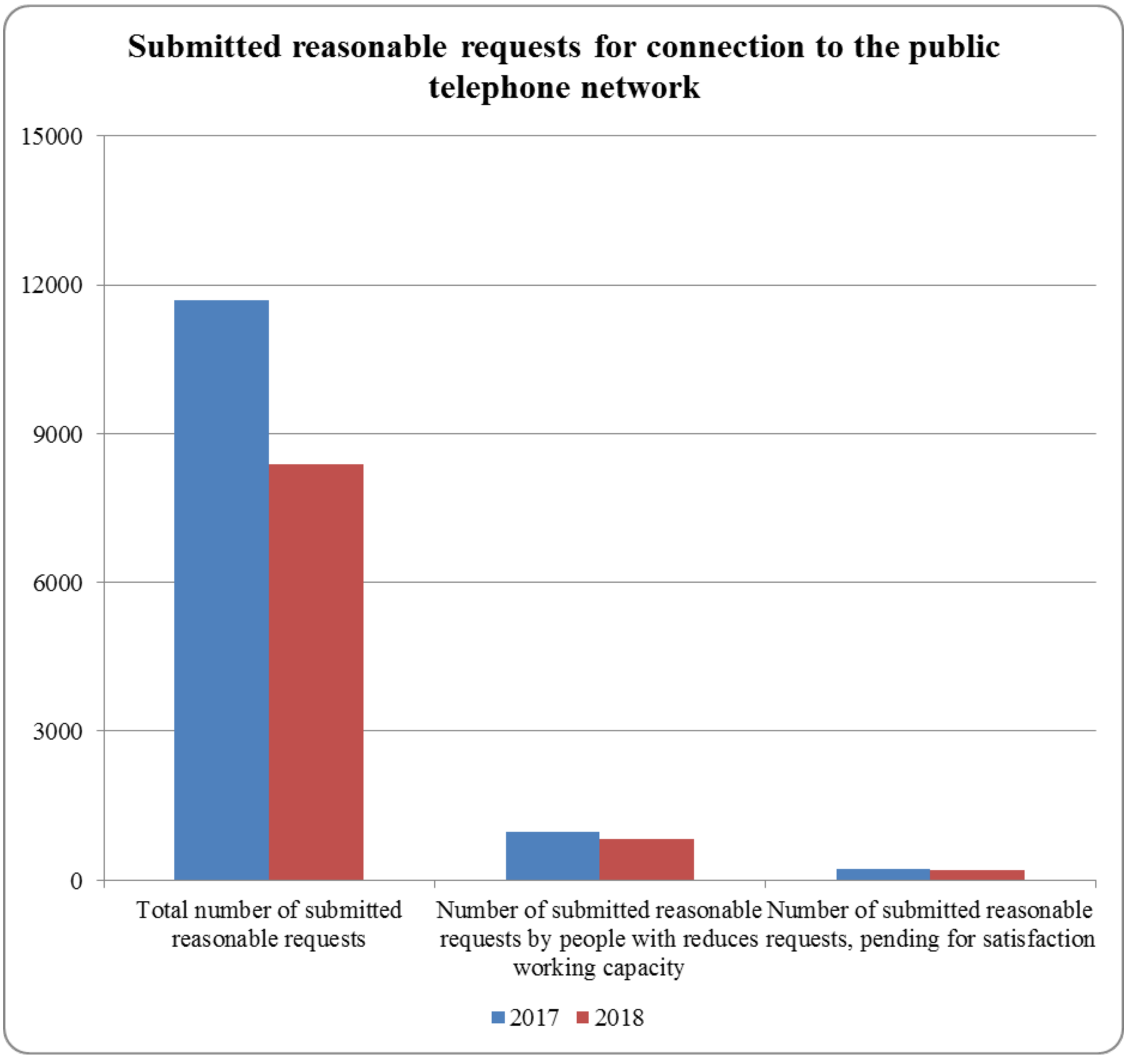
In 2018, the telephone density by households[49] registered a decline of 3.4 percentage points since the year before, as a result of the steady downward trend in the number of residential subscribers of BTC. As of 31.12.2018, BTC ensured access and provided public telephony services to nearly 16% less residential subscribers compared to the previous year.

7.2. Analysis of the provision of the universal service

7.2.1. Access to and provision of the universal service

As is evident from Figure 30 below, at the end of 2018, the total number of submitted reasonable requests for connection decreased by 28.2% compared to the previous year. A decrease in the number of submitted reasonable requests for connection filed by people with disabilities continued to be registered, as the submitted reasonable requests for connection were almost 16% less compared to the previous year. It is in confirmation of the steady downward trend in the use of services within the scope of the universal service.

[48] https://www.ekatte.com/;
[49] The ”density by households“ indicator is measured by dividing the total number of residential lines by the number of households in the country (based on data from the last official census carried out by NSI in 2011).



Source: Data submitted to CRC

Figure 30

In 2018, the number of requests for connection awaiting approval was by 13% less than the year before, which is mainly due to the decrease of the total number of submitted requests. The share of rejected requests for connection in the total number of submitted requests was 23%, as the main part of this share (nearly 70%) was the result of a ceased interest by the customers.

BTC performs its obligation to ensure free-of-charge calls to emergency numbers, as the share of traffic generated to them was preserved in 2018 and amounted to 0.08% of the total volume of traffic to national numbers.

7.2.2. Access to public payphones

The steady trend of reduction in the number of public payphones owned by BTC continued in 2018 as well, although at decreasing rates as compared to previous years (to compare with, in 2017 versus 2016, their number dropped by 12.6%, while the decrease in the current one-year period was 4.6%). As in 2017, in 2018, the criteria for a sufficient number of public payphones installed in municipalities with over 1,500 residents exceeded considerably the minimum number required by Ordinance No. 6. In the remaining categories, the criteria for a sufficient number of public payphones were not met.

According to the criteria set out in Ordinance No. 6,[50] BTC has the obligation to ensure a sufficient[51] number of public payphones. According to these criteria, Table 14 presents the number of public payphones which, if reached, would mean that the obligation to ensure a sufficient number in 2018 has been fulfilled.

Table 14

Population	Number of municipalities	Sufficient number of public payphones
below 500 residents	1,974	1,974
from 500 to 1,500 residents	1,010	1,288
over 1,500 residents	463	3,613
Total:	3,447	6,875

Source: Estimates based on data submitted to CRC

The number of public payphones, property of BTC, whose qualitative characteristics include facilities for users with impaired hearing and for users with no or impaired eyesight, also registered a decrease of 7.1% on a one-year basis. As of 31.12.2018, these public payphones made up 61.1% of the total number of public payphones in the country. Part of them provide for a textual or other type of connection for people with impaired hearing or speech and are accessible for users in wheelchairs by being installed in suitable locations. In 2018, no change in the quality parameter of the public payphones provided was observed, as it continued to constitute 90% and was in compliance with the target values of service quality parameters set out by CRC Decision No. 345/31.03.2011.

[50] Ordinance No. 6 of 13 March 2008 on the universal service under the Law on Electronic Communications (title amended SG, no. 77 of 9 October 2012).

[51] A sufficient number of public payphones is considered to be present when there is at least 1 public payphone and/or 1 public access point for voice telephony services available in municipalities with up to 500 residents; at least 1 public payphone and/or 1 public access point to voice telephony services per 500 residents in municipalities with more than 500 residents and at least 1 public payphone and/or 1 public access point for voice telephony services per 1,500 residents in municipalities with more than 1,500 residents. To determine the number of municipalities in each category by the number of residents, with a view to calculating the sufficient number of public payphones, data from the National register of settlements of NSI have been used. http://www.nsi.bg/nrnm/index.php?f=8&ezik=bul.

Free-of-charge calls to the national emergency numbers and to the single European emergency number 112 can be made from all public payphones.

7.2.3. Ensuring telephone directory and provision of enquiry services

In compliance with the LEC and with relation to the provisions of Art. 6 of Ordinance No. 5,[52] the undertaking obligated to provide the universal service must issue at least one telephone directory in printed and/or electronic form. In 2018, CRC once again approved BTC's proposal for the release of a public telephone directory for 2018 in an electronic form. The telephone directory is available at the undertaking's official website.[53] There were no sales of telephony directory in printed form.

In compliance with its obligation to provide a telephone directory enquiry service for the numbers included in the general telephone directory, BTC provided end-users with a 24-hour telephone directory enquiry service in the past year through number 11 800.

In 2018, a considerable drop of 20.4% was observed in the number of calls to enquiry services made by end-users as well as a 19% decline in the number of free-of-charge calls to emergency numbers.

7.2.4. Affordability of tariffs of the universal service

In 2018, in fulfilment of its obligation to provide price packages within the scope of universal service at affordable[54] prices, BTC continued to offer, without any change either in prices or in conditions, price packages intended for users: with low income (”Limited” plan, as named by BTC); with over 90% impaired work capacity or capacity for social adaptation (“Handicap 160” plan, as named by BTC); with over 50% impaired work capacity or capacity for social adaptation (“Handicap 300” plan, as named by BTC); people with special social needs admitted to social or health institutions (“Social and health institutions” plan, as named by BTC).

In July 2018, BTC proposed the introduction of changes to the conditions and prices of packages within the scope of the universal service “Limited plan”, “Handicap 160” and “Handicap 300”, increasing the number of included services, the prices and providing for the abandonment of the current packages. CRC initiated a public discussion in compliance with Art. 10, Para 2 of the Methodology for determining the prices and price packages of the universal service. Within the framework of the procedure initiated by CRC, BTC submitted a letter, withdrawing its proposal and extending a request for repeal of the obligations to provide price packages for people with disabilities, people with special social needs and people with low income. With its Decision No. 398/19.09.2018, CRC cancelled the procedure under Art. 197 of the LEC and rejected the undertaking's request.

As of 31.12.2018, the subscribers of price packages within the scope of the universal service decreased by 14.5% compared to those in 2017. The chart below displays the trend in the number of subscribers of price packages within the scope of the universal service for 2017 and 2018.

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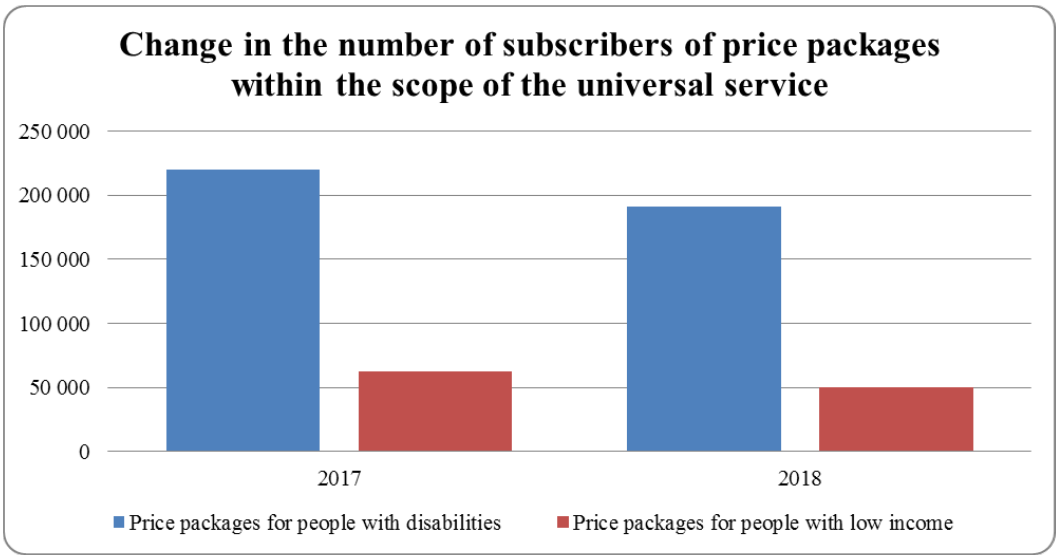
[52] Ordinance No. 5 of 13.12.2007 on the terms and procedure for release of telephone directories, including working with database, their transfer and use, and for provision of telephone enquiry services.
[53] http://www.vivacom.bg/online/cgi-bin/wpd.cgi?temp=home.html&ls=0;
[54] Stipulated in the Methodology for determining prices and price packages for the universal service adopted with Ordinance No. 254 of 23.10.2008 of the Council of Ministers, prom. SG, no. 94 of 31.10.2008.



Source: Estimates based on data submitted to CRC

Figure 31

The number of subscribers of price packages for people with low income and price packages for people with disabilities decreased in 2018 compared to the previous year by 19.6% and 13.0%, respectively, which confirmed the long-term downward trend in the use of price packages within the scope of the universal service. The data presented in Figure 31 do not include the number of subscribers using price packages for people with special social needs, because it amounted to only 0.025% of the total number of subscribers of price packages within the scope of the universal service.

7.3. Quality of the universal service provision

The Quality of Service parameters of the universal service provision are stipulated in Ordinance No. 6, as the target values of the parameters were adopted by Decision No. 345/31.03.2011 of CRC and are publicly available at the Commission's official website[55].

According to the data submitted by BTC, in 2018, the undertaking reported fulfilment of all target values.

7.4. Compensation of net costs accrued due to the universal service provision

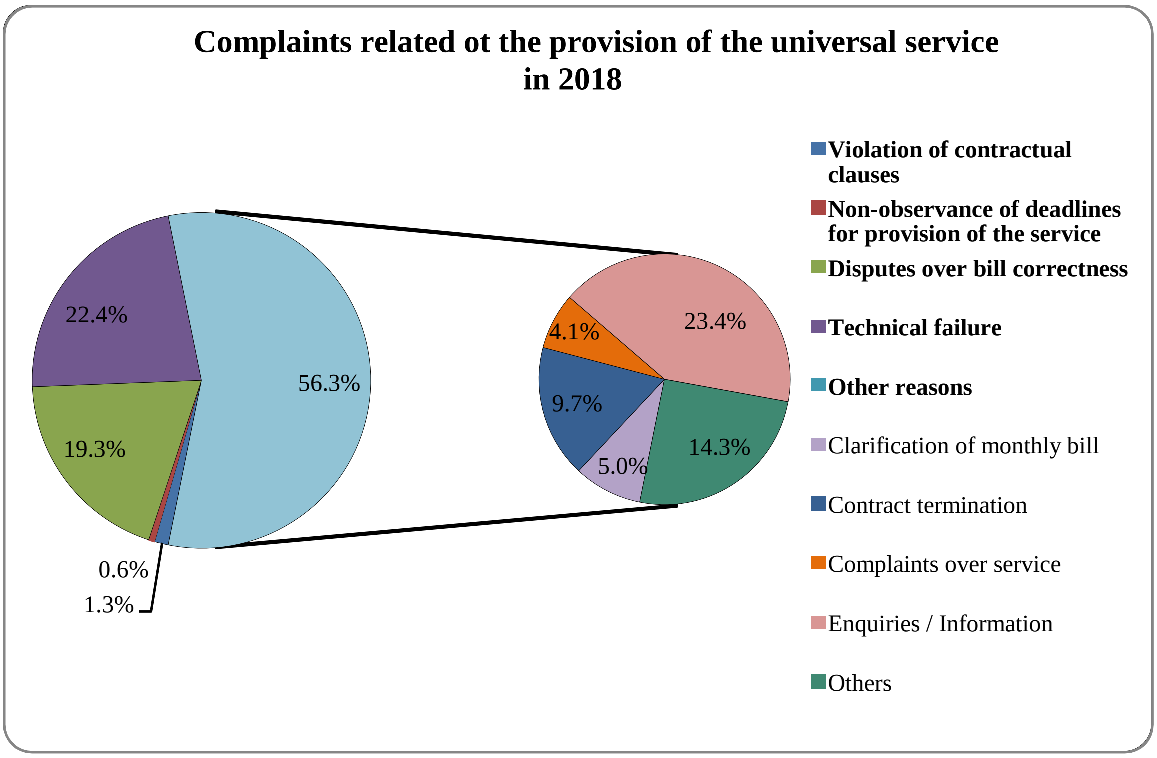
In 2018, BTC did not submit to CRC a request for compensation of the unfair burden from the universal service provision within the statutory deadline - 30.06.2018. Thus, during the last year, the amount of net costs was not calculated and it was not established whether these expenditures lead to an unfair burden for the incumbent undertaking. Taking into account the absence of a request for compensation of the unfair burden from the universal service provision, the activity of the Fund for compensation of the universal service did not start and no funds were deposited in it.

[55] http://www.crc.bg/section.php?id=904&lang=bg

7.5. Complaints and complaint resolution

According to the General Conditions governing the relations between BTC and the end-users, the undertaking gives options to the users to individually track and control their costs through: the provision of itemised bills free of charge;[56] selective limitation of outgoing calls free of charge, and deferred payment when connecting to public telephone networks.

In 2018, the number of complaints filed with BTC regarding the provision of the universal service was by 23.7% less than in 2017. Most often, the complaints disputed technical failures, bill correctness, contract termination and enquiries/information concerning clarification of monthly bills. The causes for filing complaints are illustrated in Figure 32.



Source: Data submitted to CRC

Figure 32

During the year, the percentage of complaints regarding technical failures was 22.4% of the total number of complaints, registering a growth of 4% compared to 2016 and 2017. At the same time, the percentage of complaints regarding contract termination was 9.7% of the total number of complaints, registering a drop of 6 percentage points, as compared to the same indicator in the previous year. There was a decline of 74% in the number of complaints filed as a result of violation of contractual clauses as well as a nearly 59% drop in the number of complaints concerning violation of service provision deadlines.

In 2018, the percentage of unsatisfied complaints amounted to 71% of the total number of complaints filed, registering a growth of 10 percentage points compared to 2017.

[56] The content of the itemised bill is defined in Art. 260, Para 3 of the LEC.

7.6. Prospects for development of the universal service

Part of the services within the scope of the universal service continue to be widely used, however, the interest in them is decreasing proportionately to the drop in the demand for traditional telephony services provided at a fixed location which are replaced by mobile telephony services and the expanding communication capacities via the broadband Internet access. CRC expects that the steady trend towards reduction in the number of subscribers and revenue from services within the scope of the universal service in Bulgaria will be preserved in 2019 as well.

II. LEGAL AND REGULATORY FRAMEWORK

1. EU regulatory framework for electronic communications

At the end of 2018, Directive (EU) 2018/1972 of the European Parliament and of the Council of 11 December 2018 establishing the European Electronic Communications Code was promulgated, constituting an essential revision of the applicable sector regulatory framework. Pursuant to Art. 124, Para 1 of Directive (EU) 2018/1972, Member States shall adopt and publish, by 21 December 2020, the laws, regulations and administrative provisions necessary to comply with this Directive, and they shall apply those measures from 21 December 2020.

At the end of 2018, Regulation (EU) 2018/1971 of the European Parliament and of the Council of 11 December 2018 establishing the Body of European Regulators for Electronic Communications (BEREC) and the Agency for Support for BEREC (BEREC Office), amending Regulation (EU) 2015/2120 and repealing Regulation (EC) No 1211/2009, was promulgated. This Regulation was intended to reform BEREC and its Office, as well as their powers and/or activities, and also provided for an entirely new regulation of international calls within the EU.

The European Commission also published a Proposal for a Regulation of the European Parliament and of the Council concerning the respect for private life and the protection of personal data in electronic communications and repealing Directive 2002/58/EC. This Directive is not part of the legal framework of the European Electronic Communications Code and will be the subject of a separate regulation. The final text of the regulation has not been adopted yet.

2. Legal and regulatory framework in Bulgaria

In 2018, the Law on Electronic Communications (LEC) was amended five times, yet the changes did not lead to major amendments in the regulatory framework.

Among the most important amendments to the LEC is the transfer of jurisdiction from the Supreme Administrative Court to the Administrative Court of Sofia District which will consider any legal actions initiated against CRC's decisions, constituting individual or general administrative acts, as of 01.01.2019.

Another important amendment is the repeal of Chapter 17 of the LEC "Building and maintenance of electronic communications networks and infrastructure. Right of way", as its provisions were transposed into the new Law on Electronic Communications Networks and Physical Infrastructure, prom. SG, no. 21 of 09.03.2018, effective as of the said date. With the LECNPI, Directive 2014/61/EU of the European Parliament and of the Council of 15 May 2014 on measures to reduce the cost of deploying high-speed electronic communications networks (OJ, L 155 of 23 May 2014) was transposed into the national legislation.

In Chapter 8 "Dispute resolution" of the LECNPI, CRC was appointed as the dispute resolution body within the meaning of Art. 10, Para 1 of the Directive. The disputes referred to above will have as their subject matter the provision of access to and/or shared use of physical infrastructure,[57] including the application of conditions and prices of access; deployment of electronic communications networks; coordination of activities; provision of information about existing infrastructure and planned works; on-site surveys of specific elements of the physical infrastructure and provision of access to in-building physical infrastructure. In this regard, the powers of the Commission concerning the listed matters as well as the dispute resolution procedure itself were regulated.

In Chapter 9 “Control and Penal Administrative Provisions” of the LECNPI, CRC was appointed as a control body with regard to ensuring access and shared use of physical infrastructure as well as the provision of access to in-building physical infrastructure. In addition, it laid down the legal powers of the CRC’s administrative employees who will be authorised to carry out the said control, as well as the procedure for implementation of the penal administrative liability in the event of established offences.

For the same period, the following CRC secondary legislative acts became effective:

- Decision No. 176/11.05.2018 amending and supplementing the Rules for the conditions and procedure for transferring of authorisations for the use of individually assigned scarce resource;
- Decision No. 179/11.05.2018 of CRC amending and supplementing the Rules for the conditions and procedure for issuance of authorisations for the use of individually assigned scarce resource - radio frequency spectrum for industrial needs;
- Decision No. 356/23.08.2018 amending and supplementing the Technical requirements for the operation of terrestrial networks capable of providing electronic communication services;
- Decision No. 397/19.09.2018 amending and supplementing the Technical requirements for the operation of electronic communications networks from a fixed satellite radio service, mobile satellite radio service and related equipment;
- Decision No. 418/11.10.2018 amending and supplementing the General requirements for the provision of public electronic communications;
- Decision No. 494/23.11.2018 amending and supplementing the Methodology for the terms and procedure of relevant markets definition, analysis and assessment, and criteria for designating undertakings with significant market power;
- Decision No. 559/21.12.2018 amending and supplementing the Technical requirements for carrying out electronic communications via radio equipment from the amateur radio service.

3. Leading regulatory decisions of CRC in 2018

The total number of CRC decisions adopted in 2018 was 560, the majority of which are in implementation of CRC’s powers according to the LEC. Among those decisions, the acts that play a more significant role in ensuring a foreseeable and competitive environment in the sector are as follows:

[57] Electronic communications infrastructure, in addition to utilities (electricity distribution, gas transmission, water and sewerage), transportation (railway, roads, ports, airports, underground) and other infrastructures.

- Decision No 411/03.10.2018 imposing a price restriction to the Bulgarian Telecommunications Company EAD for a period of six months from 01.11.2018 with respect to non-traffic services for IP-interconnection;
- Decision No 463/08.11.2018 on launching a public consultations procedure on the provision of the free resource in the 2 GHz and 2.6 GHz frequency bands.
- Decision No 497/23.11.2018 on launching a public consultations procedure with respect to draft Position of CRC on the fulfilment of the requirements of Article 3 and Article 4 of Regulation (EU) 2015/2120 by providers of Internet access to end-users.
- Decision No 542/13.12.2018 on launching a public discussion procedure with respect to draft decision for designation, analysis and assessment of the market of wholesale local access provided at a fixed location (Market 3a of Recommendation 2014/710/EU).

4. Carrying out electronic communications

4.1. Authorisations for the use of an individually assigned scarce resource

The authorisations for the use of an individually assigned scarce resource issued during the year are presented in Table 15.

Table 15

Authorisations for 2018 under the Law on Electronic Communications				
Electronic communications network	**Amendments/Supplements (number)**	**Authorisations issued (number)**	**Terminated/Revoked/ Expired (number)**	**Transfers (incl. partial)/ Lease (number)**
Electronic communications networks for terrestrial analogue broadcasting of radio signals with national and local coverage	77	13	6	2
Electronic communications networks from a mobile radio service - PMR	68*	31*	42	10
Electronic communications networks from the aeronautical mobile radio service	1	-	-	-
Electronic communications networks from a mobile radio service for personal calls	-	-	1	-
Terrestrial networks in frequency band 2 GHz	1	-	-	-
Terrestrial network in frequency band 1800 GHz	1	-	-	-
Electronic communications networks from the fixed satellite radio service	3	-	1	-

Electronic communications networks from the fixed radio service of the “point-to-point” type	55**	2	4	-
Electronic communications networks for fixed wireless access (FWA)	1	-	-	-
Authorisation for the use of individually assigned scarce resource - radio frequency spectrum for industrial needs	1	-	-	-
Authorisation for the use of individually assigned scarce resource – numbers for carrying out public electronic communications	14	2	2	-
Temporary authorisations	3	19*	1	-
TOTAL:	**225**	**67**	**57**	**12**

** The total number of provided radio frequencies was 182.*

*** Amendments and supplements to the technical data of a total of 4,362 radio relay links, including provided radio frequency spectrum for new 1,028 links.*

4.2. Notifications on the carrying out public electronic communications

The activities related to the notifications submitted in 2018 for the carrying out public electronic communications are presented in Table 16.

Table 16

Type of activity	2018 (number)
Processed notifications for carrying out public electronic communications	135
Processed notifications for termination of carrying out public electronic communications	84
Issued certificates for entry in the Registry	26
Undertakings entered in the Register	79
Undertakings deleted from the Register	63

4.3. Carrying out electronic communications through amateur service radio equipment

The authorisations, certificates and licenses for radio amateur qualification issued during the year are presented in Table 17.

Table 17

Authorisations, certificates and licenses	
Type of document	**2018 (number)**
Authorisations for radio amateur qualification	234
HAREC certificates	20
CEPT licenses	37
Allocated call signs	299*

**55 of the determined call signs are temporary.*

In 2018, 10 amateur radio licence exams were held with 216 examined persons in the cities of Sofia, Plovdiv, Varna and Kazanlak.

4.4. Interconnection and access

In 2018, CRC approved several proposals for amendment of Reference Interconnection Offer (RIO), submitted by BTC, concerning:

- change of the addresses of switching facilities used in the provision of TDM interconnection in the cities of Sofia, Plovdiv, Varna and Burgas;
- change of the address of BTC facilities used in the provision of IP interconnection in the city of Sofia;
- closing the TDM interconnection point in the city of Ruse;
- deletion of the contact information from Appendix 6.6 to RIO and its inclusion in the individual contracts between BTC and the undertakings.

CRC continued its activities related to the effective introduction of IP-based interconnection (IP interconnection), as 4 (four) contracts for IP interconnection between BTC and other undertakings were signed by the end of 2018. CRC also approved the prices with respect to non-traffic services for IP interconnection, as proposed by BTC. Having performed an analysis, CRC decided that BTC has not proved the cost-orientation of the prices for “VoIP port (10 Mbps)” and “Interconnection line to OLO premises - 10 Mbps” services and imposed price restrictions for a period of six months, as of 01.11.2018.

With regard to Art. 54 of the LEC, under request CRC assisted undertakings having a dispute relating to service provided under free trade agreements. Since, between the parties, there were pending court actions concerning the contract for the provision of the above services, the Commission issued the opinion that the dispute cannot be resolved using the mechanisms provided for in the LEC. The Commission also considered a request for the issue of binding instructions concerning a dispute between two undertakings with relation to request for increase of the number of interconnection lines. The dispute consideration procedure was terminated because the affected undertaking notified CRC that its request has been satisfied and it withdrew its request for the giving of binding instructions.

In addition, in 2018, the results from the public consultations on the draft decision of CRC to unify the practice of undertakings concerning the applied procedures for avoiding traffic termination with manipulated CLI were summarised. Taking into account the comments of the undertakings, the Commission prepared a new draft decision which was also subject to a public consultations procedure. By the end of the year, a final decision was not adopted.

III. ACTIVITIES UNDER THE LAW ON ELECTRONIC COMMUNICATIONS, THE LAW ON ELECTRONIC DOCUMENT, ELECTRONIC TRUST SERVICES AND THE LAW ON ELECTRONIC COMMUNICATIONS NETWORKS AND PHYSICAL INFRASTRUCTURE

1. Activities in implementation of the CRC's priorities

1.1. Effective management of scarce resources

1.1.1. Radio frequency spectrum

Electronic communications carried out through the use of radio frequency spectrum are gaining significant importance in a growing number of economic sectors from the European market and define the business environment in the Community. The increasing demand for communications services and the higher requirements in terms of their quality have led to the need for an optimal use of contemporary communications technologies and to the development of various new technological platforms using radio frequency spectrum. The Commission ensures an effective and efficient management of radio frequency spectrum, thus contributing to the reaping of maximum benefits from the introduction of new wireless communications technologies and applications in compliance with the rules of the International Telecommunication Union (ITU), the European Conference of Postal and Telecommunications Administrations (CEPT) and the European policy in the field of radio frequency spectrum.

In performing the activities related to the radio frequency spectrum management, CRC takes into account the Updated Electronic Communications Policy, the Updated State Radio Spectrum Planning and Allocation Policy in the Republic of Bulgaria, and the Regulatory policy for radio frequency spectrum management for civil needs.

On the basis of the analysis of the policies, strategies, working programmes and the long-term plans for development of the electronic communications of other regulatory authorities relating to the management of radio frequency spectrum, it was established that there was a need to update the Regulatory policy for radio frequency spectrum management for civil needs. As a result, the Commission drew up and adopted a draft Regulatory policy for radio frequency spectrum management and launched a public discussion procedure. In the draft Regulatory policy for radio frequency spectrum management for civil needs, the Commission defined its main objectives, mechanisms and approaches for radio frequency spectrum management for civil needs over the next three years. Among them are to ensure the effective management of radio frequency spectrum and to create conditions for the development of a competitive communications sector and to develop the business in order to increase the possible extent of the social and economic benefits arising from the use of the frequency resource. An accent was placed on the upcoming changes in the policy in the field of electronic communications in the European Union and their implementation in Bulgaria.

In 2018, in fulfilment of its priorities related to the effective radio frequency spectrum management, the Commission carried out a number of activities in order to promote the introduction of new technologies and services in the market.

With a view to ensure conditions for effective and harmonised use of the radio frequency band 700 MHz (694-790 MHz radio frequency band), the so called "second digital dividend", representatives of the Commission continued their active participation in the work of the interdepartmental working group with the task “to draw up a national plan and timetable" ("National Roadmap"), including detailed steps for the implementation of the obligations of the Republic of Bulgaria under Decision (EU) 2017/899 of the European Parliament and of the Council of 17 May 2017 on the use of the radio frequency band 470-790 MHz in the Union. As a result, a number of activities related to the adoption of a National Roadmap were carried out, including: adoption and submission to the Ministry of Transport, Information Technology and Communications (MTITC) of an opinion within the public discussion on the draft National Roadmap; holding meetings with NURTS Digital EAD in connection with the technical capacities for configuration and resetting of the networks in the radio frequency band 470-694 MHz; carrying out of a technical analysis of the possibilities to optimise the frequency resource with the aim of reducing the costs of the undertaking for redistribution of the provided TV channels. In the framework of Working Group No 17 Telecommunications and Information Technologies, proposals for amendment of the opinion of WG 17 on the draft Decision of the Council of Ministers on the adoption of a roadmap as well as proposals for amendment of its texts were submitted.

The aim of the National Roadmap adopted by Decision No 887/06.12.2018 of the Council of Ministers is to provide spectrum for mobile broadband networks. For the implementation of this goal, it is necessary to release range 700 MHz (frequency band 694-790 MHz) of digital television, and the Commission has taken the necessary actions in this regard. The process of re-planning of the spectrum for terrestrial digital television in the frequency band 470-694 MHz was finalised in December 2017 with the signature of the Multilateral Framework Agreement between administrations[58] participating in the South Forum for the implementation of the second digital dividend. In connection with the bilateral agreements on the new frequency plans for digital television in band 470-694 MHz signed by the representatives of the Commission with the Republic of Greece, Republic of Northern Macedonia, Romania, the Republic of Serbia, the Republic of Turkey and Ukraine, in 2018, experts from the Commission drew up and submitted to the ITU requests for international coordination of the new plan for digital terrestrial television pursuant to Art. 4 of Regional Agreement Geneva 06. As a result, the frequency zones of the new plan for digital terrestrial television were successfully coordinated.

Bulgaria is the only EU member state that has not yet allocated radio frequency spectrum in range 800 MHz (radio frequency band 790-862 MHz), the so-called "first digital dividend". In 2018, CRC representatives continued to participate in meetings at which the Ministry of Defense (MoD), the Air Forces and mobile undertakings discussed the possibility of signing an agreement for the conduct of joint tests to establish the absence of interference in the work of the radio electronic equipment of the MoD and to submit the said agreement to the Commission to be included in the temporary authorisations for the use of radio frequency spectrum for the conduct of these tests. The MoD and the mobile undertakings did not reach an agreement on the conditions for carrying out the tests, therefore the spectrum in the 800 MHz band has not yet been allocated for use.

In order to meet the growing need for next-generation (4/5 G) broadband network

[58] Albania, Austria, Bosnia and Herzegovina, Bulgaria, Croatia, Greece, Republic of Northern Macedonia, Hungary, Montenegro, Romania, Serbia, Slovenia, Turkey and Ukraine.

transmission, the Commission performed an analysis of the opportunity to provide frequency resource in the 26 GHz band.

Public consultations on issues of public importance for the electronic communications development were conducted in the past year.

In order to study the interest of the business, public consultations on the prospects for the use of the available free spectrum in the 2.6 GHz band were carried out. The analysis of the submitted opinions showed that there are no objective reasons to launch the tender procedure for the provision of spectrum from the 2.6 GHz band, because of the high annual fee for the use of the frequency resource.

At the end of 2018, the Commission launched a public consultations procedure on the provision of the free resource in the 2 GHz and 2.6 GHz frequency bands. With the consultations, questions were raised concerning the allocation of spectrum in the 2 GHz frequency band, its provision and the possibilities for the issue of the temporary authorisations in the 2 GHz and 2.6 GHz bands. An analysis of the submitted opinions of interested undertakings will be made in 2019 and its results will be published on the CRC's website.

Having studied and analysed the best European practices concerning the amount of fees for the provision and use of radio spectrum, the Commission adopted a draft ministerial decree amending and supplementing the Tariff of fees collected by CRC under the LEC (the Tariff). The draft aims to create conditions for the utilisation of the frequency resource in the 2.6 GHz band by reducing the one-off and the annual fees as well as a more effective management of the spectrum in the 3.6 GHz and 26 GHz bands, by removing the regional principle of fees determination. On the basis of the comparative analysis of fees in the 1.5 GHz, 2.6 GHz bands and radio frequency bands allocated to the fixed satellite and mobile satellite radio services, a proposal for amendment and supplement to the Tariff was drawn up, with a view to changing the fees in the 1.5 GHz, 2.6 GHz bands and radio frequency bands allocated to the fixed satellite and mobile satellite radio services.

With a view to reducing the administrative burden and taking into account the provision of Art. 87, Para 11 of of the Code of Tax and Social Security Procedure (CTSSP), the Rules on the conditions and procedures for the transfer of authorisations for the use of individually assigned scarce resource and the Rules on the conditions and procedures for the granting of authorisations for use of individually assigned scarce resource - radio frequency spectrum for industrial needs - were amended in the past year.

Allocation, planning, assignment and effective use of the radio frequency spectrum

Following one of its main priorities – effective management and efficient use of the scarce resource – radio frequency spectrum, CRC has studied and analysed the necessity ofamendment and supplement of the secondary legislation relating to the management of the radio frequency resource. As a result of this analysis, the following secondary legislative acts were amended and supplemented:

- Rules for carrying out electronic communications through radio equipment using radio frequency spectrum which does not need to be individually assigned (the Rules);

- Technical requirements for operation of terrestrial networks for provision of electronic communications services;

- Technical requirements for operation of electronic communications networks of the fixed satellite radio service, mobile satellite radio service and related equipment;

- Technical requirements for operation of electronic communications networks of the fixed radio service and related equipment;

- Technical requirements for carrying out electronic communications through amateur service radio equipment.

With the amendment and supplement to the above regulations, the provisions of new decisions of the EC and of the Electronic Communications Committee (ECC) on the harmonised use of radio frequency spectrum were transposed into the Bulgarian legislation.

With the amendment of and supplement to the Rules in accordance with Implementing Decision (EU) 2018/1538[59], the conditions for harmonised use of basic radio frequency bands in the framework of the Union by technically advanced radio equipment for radio frequency identification and new short-range devices, allowing new types of "machine-to-machine" and "Internet of Things" applications (non-specific short-range devices and broadband data transfer devices) were defined. Part of the frequency bands were altered only with the purpose of ensuring a frequency resource of 2x1.4 MHz to expand the spectrum designated for GSM in the railway networks (E-GSM-R). In order to achieve compliance with the conditions for the use of radio frequency band 26.96-27.41 MHz (CB 27 MHz) laid down in Decision (11)03[60] and Recommendation ERC/REC 70-03[61] of the ECC, the conditions for the use of the antennas from the CB (Citizens' Band) radio equipment were removed.

The standards in the Rules were amended in compliance with the new Bulgarian standards which introduce harmonised European standards, as well as in compliance with the new and updated standards of the European Telecommunications Standards Institute (ETSI).

With the amendment of and supplement to the Technical requirements for operation of terrestrial networks permitting provision of electronic communications services, the following decisions were transposed into the Bulgarian legislation:

- Commission Implementing Decision (EU) 2018/637 of 20 April 2018 amending Decision 2009/766/EC on the harmonisation of the 900 MHz and 1800 MHz frequency bands for terrestrial systems capable of providing pan-European electronic communications services in the Union as regards relevant technical requirements for the Internet of Things

- Commission Implementing Decision (EU) 2018/661 of 26 April 2018 amending implementing Decision (EU) 2015/750 on the harmonisation of the 1452-1492 MHz frequency band for terrestrial systems capable of providing electronic communication services in the Community as regards its expansion in the harmonised 1427-1452 MHz and 1492-1517 MHz frequency bands.

In accordance with the LEC, the Communications Regulation Commission may issue an authorisation for the use of individually assigned scarce resource - radio frequency spectrum for digital terrestrial broadcasting (T-DAB/T-DAB+). Based on the authorisation for the use of radio frequency spectrum for electronic communications via networks for terrestrial digital broadcasting, only licensed radio programmes should be distributed. Presently, however, there is no licensed content of radio programmes to be distributed in a digital manner. In this context and in light of the lack of a long-term strategy in the field of terrestrial digital broadcasting of radio signals, CRC, jointly with the Council for Electronic Media (CEM), has taken actions to prepare an official document reflecting the state policy on the matter.

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[59] Implementing Decision (EU) 2018/1538 of 11 October 2018 on the harmonisation of radio spectrum for use by short-range devices within the 874-876 and 915-921 MHz frequency bands.

[60] ECC Decision (11)03 of 24 June 2011 on the harmonised use of frequencies for Citizens' Band (CB) radio equipment;

[61] ERC/REC 70-03 relating to the use of Short-Range Devices (SRD).

In 2018, CRC launched a public consultations procedure concerning the draft Position on the issue of authorisations for the use of individually assigned scarce resource - radio frequency spectrum for terrestrial digital broadcasting (T-DAB+). According to the draft Position, until a strategy for development of terrestrial digital broadcasting of radio signals in the Republic of Bulgaria is adopted and conditions are created for broadcasting of a CEM licensed content, the Commission considers it appropriate to suspend the issue of authorisations, including temporary ones, for the use of individually assigned scarce resource - radio frequency spectrum for terrestrial digital broadcasting (T-DAB+).

During the past year, the Commission amended and supplemented the Technical requirements for operation of electronic communications networks of the fixed radio service and related equipment, thus defining the conditions for the use of radio frequency bands 71-74 GHz and 81-84 GHz from the networks of the "point-to-point" type. Thus, the provisions of the ECC Recommendation on the allocation of radio frequency spectrum for systems from a fixed radio service operating within the 71-76 GHz and 81-86 GHz bands were completely transposed. With this amendment, recommendations and standards for particular bands were also updated with a view to the effective and efficient use of the scarce resource - radio frequency spectrum - relevant to electronic communications networks from a fixed radio service and related equipment.

In 2018, an overall assessment of the Technical requirements for carrying out electronic communications through amateur service radio equipment was made, as a result of which new Technical requirements were adopted. With a view to achieving a greater clarity and perspicuity, changes were introduced to the procedures subject to the Technical requirements and their application was facilitated. The new Technical requirements removed the age restrictions for admission to an examination for the acquisition of an amateur radio class 2. The requirements to apply for amateur radio class 1 were facilitated by removing the condition for the holding of an Amateur Radio Class 2 License for a period of not less than 6 months. Taking into account the current practice, criteria were added requiring the allocation of call signs depending on the sign's specifics, its purpose, and the technical competence of the amateur radio operator. To achieve a harmonised use of the radio frequency spectrum by an amateur radio service, radio frequency bands for amateur repeaters as well as emission classes were brought in accordance with the allocation of the International Amateur Radio Union.

In the past year, in order to facilitate the users of the frequency resource and to reduce the number of legislative acts, the Technical Requirements for the operation of mobile terrestrial networks and related equipment and the Technical Requirements for the operation of electronic communications networks from a mobile radio service and related equipment were brought together in a single regulation. This helped make the currently applicable provisions more precise, achieve a greater clarity and perspicuity of procedures that are the subject matter of the regulation, and facilitate its enforcement.

In connection with the public discussion of a draft amendment and supplement to the National Plan for Allocation of the Radio Frequency Spectrum, following an analysis, the Commission drew up and submitted an opinion to the Ministry of Transport, Information Technology and Communications and coordinated the draft National Plan for Allocation of the Radio Frequency Spectrum.

In accordance with the amendments and supplements to the above secondary legislative act regulations in the ECO Frequency Information System of the European Communications Office - EFIS (ECO), the data on the use of the frequency resource in the Republic of Bulgaria were updated.

In the framework of the interdepartmental working group for the preparation of the Republic of Bulgaria for participation in the World Radiocommunication Conference (WRC-

19), Commission experts extended proposals in connection with the preparation of the position of the Republic of Bulgaria on the items from the conference agenda.

Mobile radio service

In 2018, CRC issued two temporary authorisations for the use of individually assigned scarce resource – radio frequency spectrum in the 2 GHz band - respectively to:

– A1 BULGARIA EAD was assigned frequency resource 2x15 MHz for the testing of new technical methods and/or technologies for the carrying out of electronic communications in the LTE network of the undertaking;

– BULGARIAN TELECOMMUNICATIONS COMPANY EAD was assigned frequency resource 2x15 MHz for the testing of new technical equipment for the carrying out of electronic communications in the LTE network of the undertaking.

In the 2.6 GHz band, three temporary authorisations for the use of individually assigned scarce resource – radio frequency spectrum - were issued respectively to:

- A1 BULGARIA EAD was assigned frequency resource 2x40 MHz for the testing of new technical methods and/or technologies for the carrying out of electronic communications in the LTE network of the undertaking;
- TELENOR BULGARIA EAD was assigned frequency resource 2x20 MHz for the testing of new technical methods and/or technologies for the carrying out of electronic communications in the LTE network of the undertaking;
- BULGARIAN TELECOMMUNICATIONS COMPANY EAD was assigned frequency resource 2x20 MHz for the testing of new technical equipment for the carrying out of electronic communications in the LTE network of the undertaking.

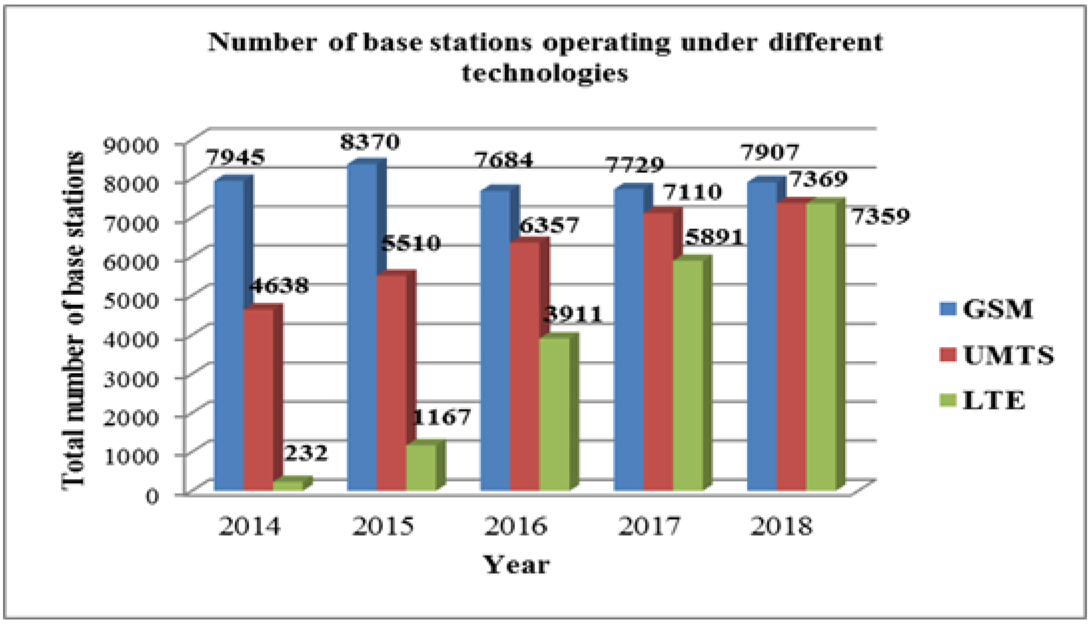
In 2018, CRC issued to A1 BULGARIA EAD one temporary authorisation for the use of individually assigned scarce resource – radio frequency spectrum in the 3.6 GHz band. With the temporary authorisation, frequency resource 100 MHz was assigned for the testing of new technical methods and/or technologies for the carrying out of electronic communications via 5G technology

Following an analysis of the radio frequency spectrum provided for use and a national coordination and agreement of radio frequencies and frequency bands with all state authorities, departments and agencies concerned, 182 radio frequency channels (120 simplex and 31 duplex) were provided to undertakings, of which 66 radio frequencies were for the construction of 56 new radio networks for the provision of electronic communications for private needs through an electronic communications network from the mobile radio service. The total number of deployed networks reached 1,912.

Figure 33 presents graphically the number of base stations operating under different technologies. As the chart clearly shows, the number of base stations operating under the LTE technology is increasing at the highest rate. An increasing number of users are taking advantage of the capabilities of LTE networks, as they provide high-speed data transfer broadband services. To satisfy the growing consumption, undertakings develop their networks and increase the number of base stations operating under the LTE technology. This trend is also observed on a global scale. According to data[62] of the GSM Association (GSMA), in 2018, the 4G

[62] The Mobile Economy 2019, https://www.gsmaintelligence.com/research/?file=b9a6e6202ee1d5f787cfebb95d3639c5&download

technology outpaced the 2G one, and is shortly expected to become a leading mobile technology.



Source: CRC

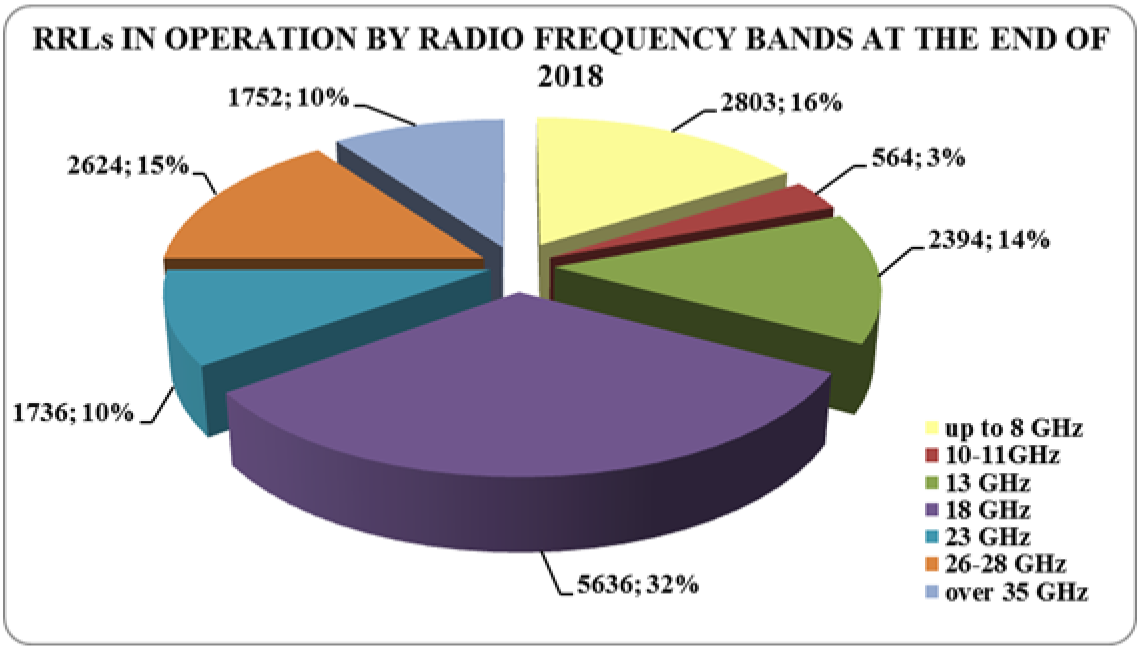
Figure 33

Fixed radio service

In 2018, 55 amendments and supplements were made to authorisations for the use of individually assigned scarce resource – frequency spectrum – for the provision of electronic communications via electronic communications network of the point-to-point type concerning the technical data of a total of 4,362 one-way radio relay links (RRLs). With them, radio frequency spectrum was allocated to new 1,028 links, their total number reaching 17,509 versus 17,319 for 2017 (838 links were closed in 2018). The trend for deployment of high-tech digital systems using XPIC/CCDP technologies continued, as the number of RRLs using these systems reached 9,384 at the end of 2018 (an increase of 8.9% compared to 2017 – 8,618 items).

A growth in the use of high-frequency bands, compared to the total number of RRLs, was once again registered. In band 18 GHz, their number reached 5,636 (5,520 in 2017), preserving the 32% share in the total number of RRLs at the end of 2018. The development of high-density communications networks using the super-high-frequency bands continued. At the end of the year, RRLs in bands 23 GHz, 26 GHz, 28 GHz, 38 GHz and 76 GHz, for which there are authorisations issued for the use of the frequency spectrum, totalled 6,112. The percentage ratio of the five bands was about 35% of the total number of RRLs. In 2018, the use of coupled radio frequency bands 74-76 GHz and 84 GHz for high-capacity RRLs continued, as their number reached 178 at the end of the year.

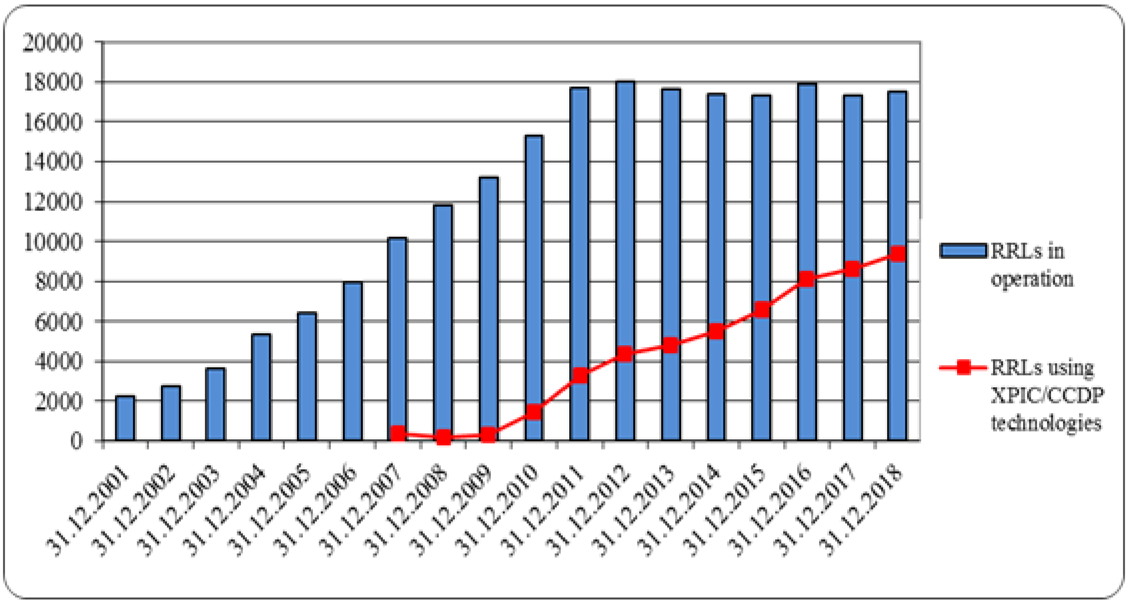
Figure 34 presents information on the share distribution of the active RRLs by radio frequency bands assigned with authorisations for the use of individually assigned scarce resource – frequency spectrum – for the provision of electronic communications via electronic communications network of the point-to-point type, at the end of 2018.



Source: CRC

Figure 34

Figure 35 displays the active RRLs by years, compared with the part of them which uses XPIC/CCDP technologies.



Source: CRC

Figure 35

In connection with the rapid development of 4G and the upcoming introduction of 5G electronic communications networks, and the laying down of the conditions for the use of radio frequency bands 71-76 and 81-86 GHz, networks of the "point-to-point" type, the undertakings providing electronic communications services were given new opportunities for ultra-wideband transfer via a viable wireless alternative of communications networks with optic-based solutions.

Satellite radio services

In 2018, the activity related to regulation of satellite radio services was focused on the coordination of the positions using geostationary orbit from fixed – satellite (FSS) and broadcasting – satellite (BSS) radio service.

Pursuant to the Rules of Procedure of the Council of Ministers and its administration, documents were prepared and submitted for coordination with regard to the conclusion of international agreements with the administrations of the Republic of Armenia, the Republic of Greece and the Republic of Cyprus on the inclusion of territories to the service areas of satellite networks operating within the planned bands, regulated by Appendix 30B of the Radio Regulations (RR) of the International Telecommunication Union (ITU). As a result, CRC concluded international agreements with the administrations of the Republic of Armenia - for mutual inclusion of the territories in the service areas of the satellite networks of the two countries, operating within the planned bands, regulated by Appendix 30B of the RR, and the Republic of Cyprus - for inclusion of the territory of the Republic of Bulgaria in the service area of the Cypriot satellite networks, operating within the planned bands, regulated by Appendix 30B of the RR.

The successful launching and entry into service of the first Bulgarian satellite in June 2017 significantly increased the intensity of the coordination process. The goal of this process is to avoid potential interferences to the Bulgarian planned systems on position 1.2^{o}W (BSS) and 56.02^{o} E (FSS), as well as of the additional modification made to the planned position for BSS at 1.9^{o}E. To implement the coordination activities, analysis was performed of the biweekly circulars (BR International Frequency Information Circular - BRIFIC) issued by the Radiocommunication Bureau of ITU, using specialised software products provided to the administrations. In addition to analysis of the biweekly circulars, an analysis was also made of the proposals received from other administrations to conclude agreements with a view to the successful coordination of the Bulgarian satellite systems.

After analysing of all biweekly circulars for 2018, the relevant objections were sent in view of performing the regulatory functions of CRC as regard the efficient use and effective management of the radio frequency spectrum.

During the past year, the Commission submitted applications for international coordination of the BUL-QV-1.9E satellite system for a position on geostationary orbit 1.9 E in the 40/50 GHz ranges, and of the nano-satellite ENDURO SAT ONE on non-geostationary orbit operating within the range dedicated to the amateur satellite service, which were published in BRIFIC.

In 2018, in accordance with the terms of the Radio Regulations, the activity under the procedure for notification of the additional application for modification of the BSS plan on a position of geostationary orbit 1.9^{o} E continued.

Broadcasting

In 2018, in relation to the request of the Council for Electronic Media (CEM) for the provision of free frequency resources for 13 settlements concerning procedures to hold a competition, information was provided on 3 frequency assignments in the VHF band for the towns of Sozopol, Boboshevo and Svilengrad, including technical parameters, admissible powers, points of broadcasting as well as other technical information.

A total of 96 technical characteristics of electronic communications networks for terrestrial analogue broadcasting of radio signals in the VHF band (frequency band 87.5-108.0 MHz) were examined and analysed, of which 36 were of undertakings authorised to use individually assigned scarce resource – radio frequency spectrum carrying outelectronic communications through electronic communications network for terrestrial analogue broadcasting with national coverage, and 60 of undertakings authorised to use individually assigned scarce resource – radio frequency spectrum for for carrying out electronic communications through electronic communications network for terrestrial analogue broadcasting with local coverage.

In 2018, CRC issued to ET DIP TRADING - PAVEL KOSTADINOV a temporary authorisation for the use of individually assigned scarce resource – frequency spectrum for electronic communications through electronic communications network for digital terrestrial broadcasting on the territory of the city of Sofia with the purpose of testing new technical methods and technologies (T-DAB+). The Commission withdrew the temporary authorisation before its expiry date, because the undertaking did not use the provided individually assigned scarce resource for its intended purpose and in the manner laid down in the temporary authorisation.

In the past year, three a requests were filed with CRC for the issue of temporary authorisations for the use of individually assigned scarce resource – frequency spectrum for electronic communications throught electronic communications network for digital terrestrial broadcasting on the territory of the city of Sofia. In this respect, five technical characteristics of the electronic communications network for digital terrestrial broadcasting were examined and analysed.

Given the lack of licensed content for radio programmes which are distributed in a digital way, despite the existence of free frequency resource, the Commission could not satisfythe requests submitted for the issue of authorisations for digital terrestrial broadcasting using the T-DAB+ technology.

National and international coordination

In 2018, in the Advisory Council for national coordination and agreement to CRC, 2,501 radio frequencies and frequency bands were coordinated and agreed. National coordination and agreement with all state authorities, departments and agencies concerned is carried out with the goal to ensure the aeronautical and maritime safety, the protection of national security, and the efficient use of the radio frequency spectrum.

Based on requests received from other administrations, international coordination of 9 radio frequency assignments with the relevant technical parameters was carried out, in accordance with the Regional Agreement for usage of the 87.5-108.0 MHz frequency band for VHF (FM) sound broadcasting, Geneva, 1984 (Geneva 1984), while coordination was refused for 1 radio frequency assignment due to probable interferences with Bulgarian radio stations.

In the past year, all publications in the biweekly circulars BRIFIC for terrestrial radio services were processed and analysed. As a result, coordination took place of the following:

- 47 radio frequency assignments of foreign administrations their relevant technical parameters according to the Regional Agreement, Geneva, 1984, while the coordination of one radio frequency assignment was rejected due to possible interference to Bulgarian radio stations;

- 193 radio frequency allotment and 259 radio frequency assignments for amendment of the GE06D digital plan, and 154 radio frequency assignments of other administrations for amendment of the GE06L list with the relevant technical parameters, in accordance with the

Regional Agreement relating to the planning of the digital terrestrial broadcasting in the 174-230 MHz and 470-862 MHz frequency bands (Geneva 2006).

The Radio Communication Bureau was sent a request for the addition of:

- 3 radio frequency assignments of Bulgarian VHF radio stations in Plan Geneva 1984, and 1 radio frequency assignment was recorded in Part B of Plan Geneva 1984.

- 114 DVB-T and 72 T-DAB radio frequency allotments to Plan GE06D in accordance with the Regional Agreement relating to the planning of the digital terrestrial broadcasting in the 174-230 MHz and 470-862 MHz frequency bands (Geneva 2006). 14 DVB-T and 32 T-DAB radio frequency allotment were entered in Plan GE06D.

In accordance with the procedures under Art. 12 of the Radio Regulations of the ITU, 207 (86 for season A and 121 for Season B) radio frequency assignments for terrestrial analogue and digital broadcasting of radio signals within the HF bands were coordinated.

Radio frequency assignments for satellite networks from the biweekly circulars BRIFIC for fixed-satellite and broadcasting-satellite radio services were processed and analysed. As a result of the performed examinations of the technical parameters and the further calculations, correspondence was exchanged with ITU and the relevant foreign administrations which had filed their requests in the biweekly circulars. In order to protect the Bulgarian positions on geostationary orbit and the assignments for fixed radio service from interferences, the CRC sent objections, in accordance with the procedural rules of the Radio Regulations, to ITU and to the administrations whose satellite networks might potentially affect us, as follows:

Written objections

- in coordination of non-planned satellite systems and existing Bulgarian terrestrial networks, pursuant to Art. 21 of the Radio Regulations – 12 objections for 20 satellite systems;

- in coordination of satellite networks from the fixed-satellite radio service emitting in Space to Earth direction and possible interference to the feeder link of a satellite from the broadcasting-satellite radio service, pursuant to Art. 7 of Appendix 30A of the Radio Regulations – 11 objections for 29 satellite systems;

- coordination between a satellite network on planned position from the broadcasting-satellite radio service and non-planned satellite network, pursuant to Art. 7 of Appendix 30 of the Radio Regulations – 9 objections for 17 satellite systems;

- coordination in exceeding the carrier-to-noise (C/N) ratio for satellite systems from the fixed-satellite radio service in frequency bands 4500-4800 MHz, 6725-7025 MHz, 10.70-10.95 GHz, 11.20-11.45 GHz and 12.75-13.25 GHz, pursuant to Appendix 30B of the Radio Regulations – 6 objections for 6 satellite systems.

- request for inclusion into coordination when exceeding the noise temperature from non-planned satellite system to satellite system operating in the frequency band 21.4-22 GHz, pursuant to Art. 9.52 of the Radio Regulations – 2 objections for 2 satellite systems.

Objections submitted via specialised ITU applications

- coordination of non-planned satellite station, potentially affecting another non-planned satellite station, pursuant to Art. 9.7 and Art. 9.41 of the Radio Regulations – objections were made for 126 satellite systems, as written notices were sent to the relevant administrations;

- coordination of satellite station from broadcasting-satellite radio service and fixed radio service when both are on primary basis, pursuant to Art. 9.11 of the Radio Regulations – objections were made for 2 satellite systems;

- coordination of satellite station using non-geostationary orbit and satellite system on geostationary orbit, pursuant to Art. 9.12A of the Radio Regulations – objections were made for 16 satellite systems;
- coordination of emitting satellite station and receiving station from fixed radio service included in the table of frequency assignments, pursuant to Art. 9.14 of the Radio Regulations – objections were made for 21 satellite systems;
- coordination of a satellite network on non-planned position from the broadcasting-satellite radio service and non-planned satellite network, pursuant to Art. 4 of Appendix 30 of the Radio Regulations – 1 objection was made for 1 satellite system;

The protection of the orbital resources of the Republic of Bulgaria for fixed-satellite and broadcasting-satellite radio services from other satellite systems is an important factor for the smooth implementation and operation of the national systems and the modification made from broadcasting-satellite radio service. Moreover, coordination allows the smooth operation of radio services in bands on co-primary basis.

Electromagnetic compatibility

During the year, electromagnetic compatibility analyses of 63 Bulgarian and 42 foreign VHF radio broadcasting stations with the aeronautical systems ILS, VOR and COM were carried out.

Due to the identified possible interference while carrying out analysis for electromagnetic compatibility with aeronautical radio services, 27 radio frequency assignments were submitted for measurement under the Methodology for measuring A1 type intermodulation products generated by the operation of closely situated VHF-FM radio transmission stations.

1.1.2. Numbering resource

In 2018, a procedure was launched for public discussion of an amendment and supplement to Ordinance No. 1 of 2010 regarding the rules for use, allocation and the procedures of primary and secondary assignment for use, reservation and withdrawal of numbers, addresses and names and of functional specifications (FSs) for portability of geographic, mobile and non-geographic numbers.[63]

The draft amendment of Ordinance No. 1 provides a regulation of:

- the possibility to use the geographic numbers for provision of nomadic telephone services;
- the possibility to assign numbering resources to Mobile Virtual Network Enablers (MVNE)
- rules for the charging phone calls with 700 range numbers

[63] Functional specifications for portability of geographic numbers in case of changing the fixed telephony service provider and/or a change of the address within a geographic national destination code; Functional specifications for portability of nationally significant numbers in case of changing the public mobile telephony service provider; Functional specifications for portability of non-geographic numbers in case of changing the relevant service provider.

The draft amendments of the FSs for portability are intended to regulate the possibility for portability of numbers to providers using secondary assigned numbers.

At the end of 2018, the total number of undertakings authorised to use the individually assigned scarce resource – numbers for provision of public electronic communications, was 26.

In 2018, the following were allocated to undertakings:

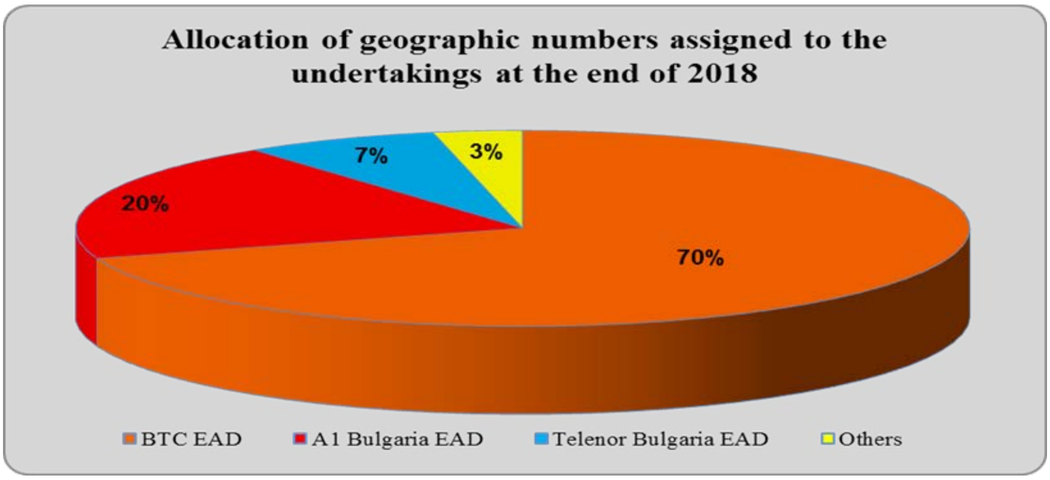
- 7,000 geographic numbers;
- 1,200 numbers for the “Personal number” service (700);
- 100 numbers for freephone services (800);
- 2 international signaling point codes (ISPC);
- 2 national signaling point codes (NSPC).

Due to optimisation of networks and services of the alternative undertakings or termination of their activities in 2018, the following were released:

- 11,700 geographic numbers;
- 100 numbers for the “Personal number” service (700);
- 3 national signaling point codes (NSPC);
- 2 international signaling point codes (ISPC).

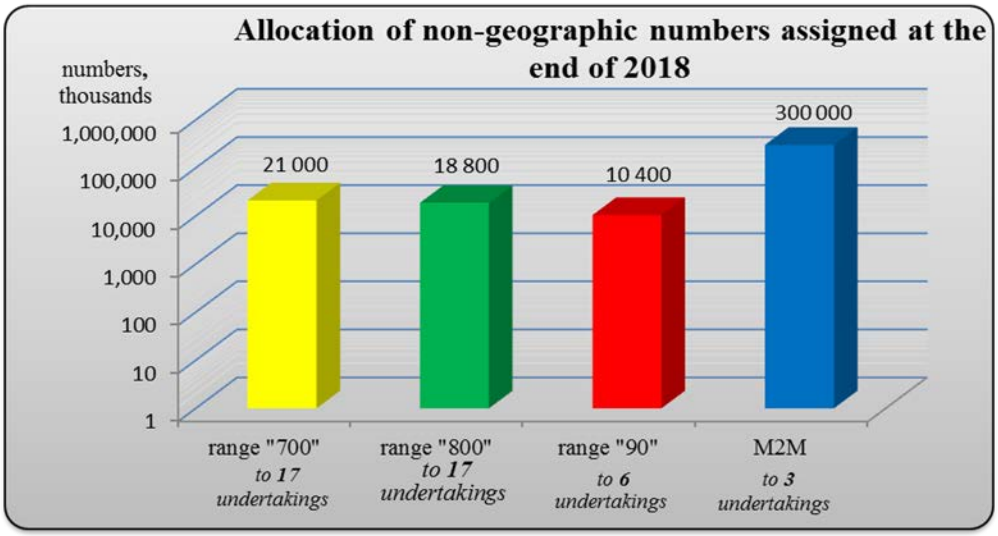
During the year, two new undertakings were issued authorisations for the use of individually assigned scarce resource – numbers - DUALITY COMMUNICATIONS OOD and SOF TELECOM EOOD. VESTITEL BG AD and RUTELKOM OOD have asked for their authorisations to use a numbering resource to be cancelled.

The allocation of geographic and non-geographic numbers assigned to undertakings at the end of 2018 is displayed in the figures below.



Source: CRC

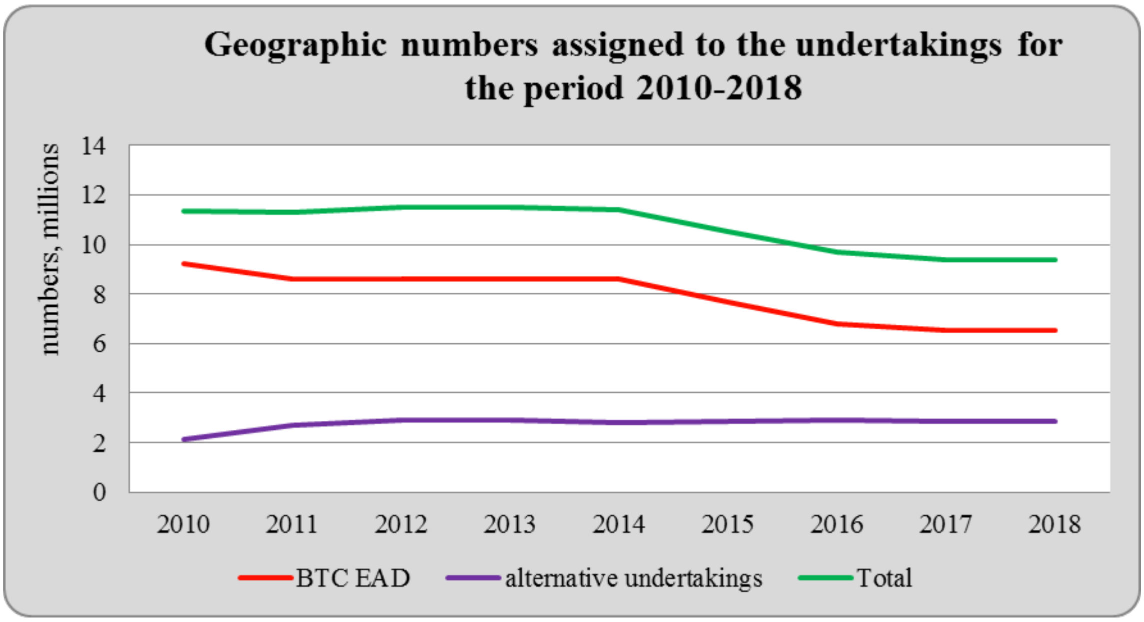
Figure 36



Source: CRC

Figure 37

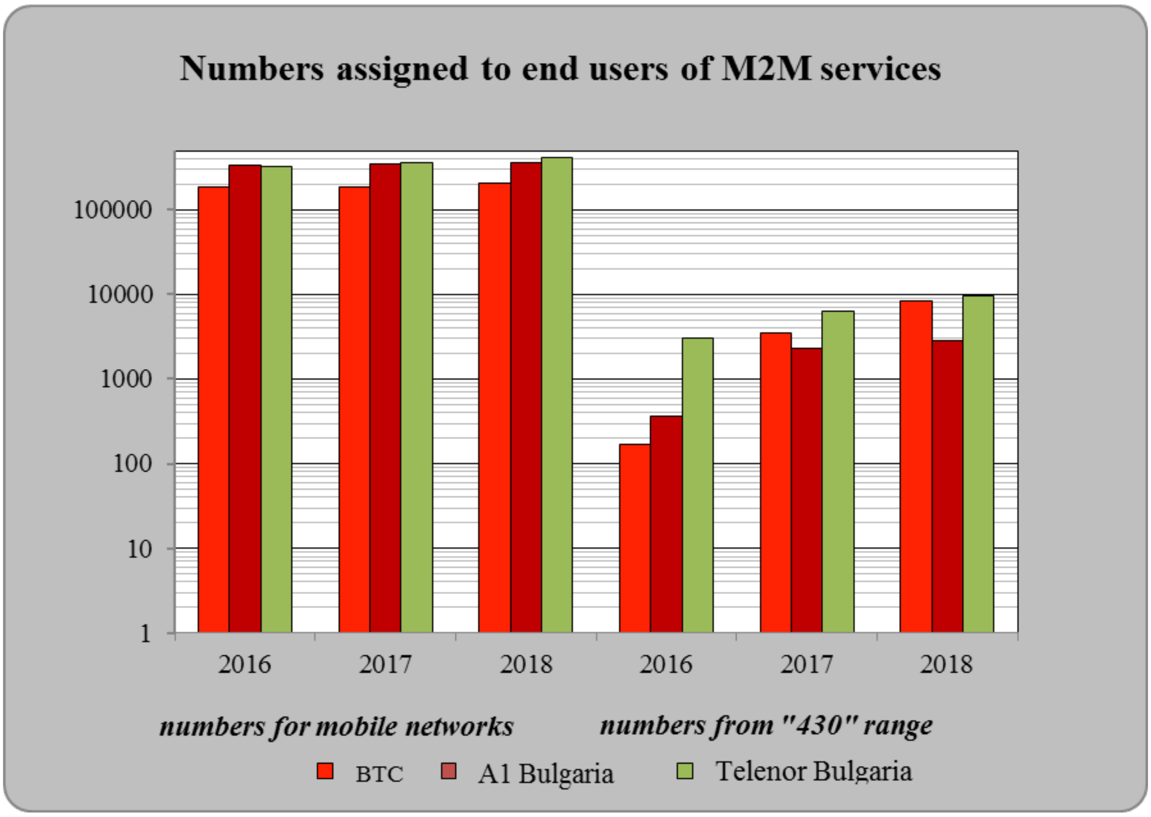
In 2018, the steady downward trend in the number of geographic numbers allocated to the undertakings continued. It was the result of the decreased interest of end-users in the fixed telephony service.



Source: CRC

Fig. 38

The numbering resource within the “430” range – for access to services using Machine-to-Machine (M2M) communication - was assigned to three undertakings – A1 Bulgaria EAD, BTC and Telenor Bulgaria EAD. Data on the numbers provided to end-users are presented in the figure below:



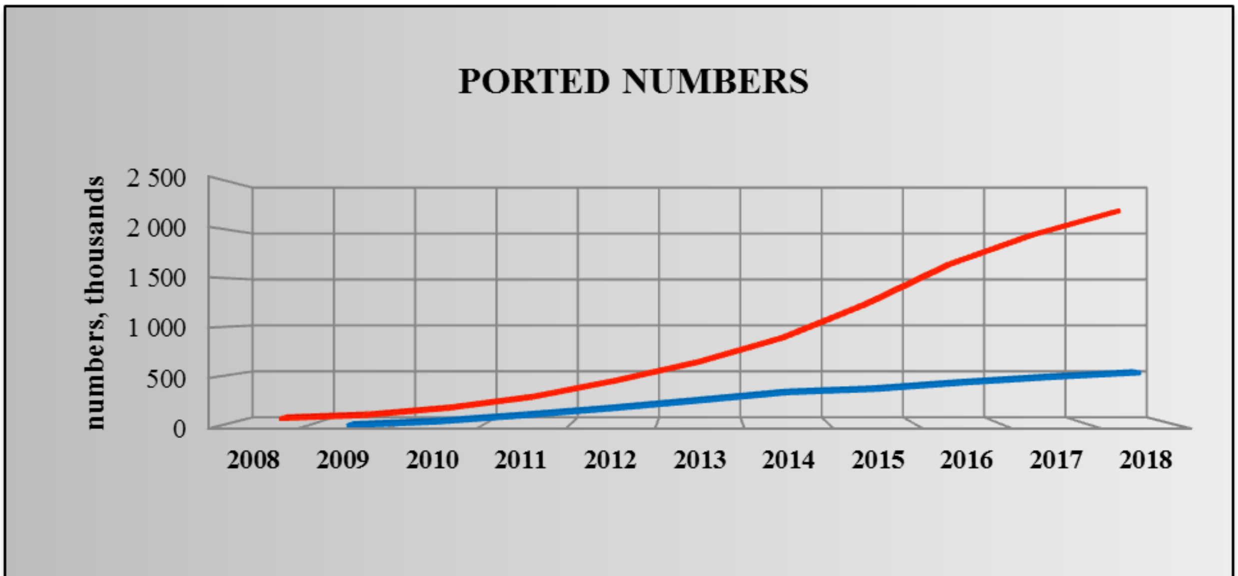
Source: CRC

Figure 39

In 2018, an insignificant increase in the numbers within the “430” range, provided to end-users, was reported. More numbers were used for M2M services from the ranges for access to mobile networks.

Number portability

In 2018, there was in increase in the number of end-users who took advantage of their right to retain their number in case of changing the undertaking providing the relevant service. The trend for the porting of more numbers in mobile networks than numbers in fixed networks was preserved.



	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
fixed networks		9 558	46 460	110 039	180 199	260 024	342 317	375 368	440 050	495 199	541 558
mobile networks	23 926	55 830	131 915	247 910	420 917	621 206	876 199	1233 977	1656 147	1969 617	2216 209

Source: CRC

Figure 40

For non-geographic numbers, a decline of ported numbers was observed - in 2018, 67 numbers were ported, as compared to 115 in 2017.

1.2. Regulation and monitoring of the electronic communications markets

The analysis of the competitive environment on the markets for electronic communications networks and/or services and the regulatory measures adopted in order to ensure such competitive environment, are among the main working priorities of CRC. The Commission's activities related to the implementation of these objectives in 2018 were:

Regulation of the electronic communications markets

In 2018, in fulfilment of the priorities of CRC, the work on the preparation of the third review of the analysis and assessment of the market of wholesale local access provided at a fixed location was started (Market 3a of Recommendation 2014/710/EU). On 17.12.2018, by CRC Decision No 542 of 13.12.2018, the draft was published on the CRC's website for public discussion, as stakeholders were given time up to 31.01.2019 to express their opinions. The draft decision was forwarded to the Commission for Protection of Competition for its opinion.

Monitoring of the electronic communications market

In accordance with Art. 40 of the LEC, as well as Art. 15 of the Methodology for the terms and procedures of relevant markets definition, analysis and assessment[64] (the Methodology), CRC regularly collects information from the undertakings providing electronic communications through observation of a set of parameters for which data is collected by means

[64] https://crc.bg/files/smp-metodika-2018_10.01.2019g.pdf (issued by the Chairman of the Communications Regulation Commission, prom. SG no. 89 of 13.11.2012, in force as of 13.11.2012, amended and supplemented, no. 101 of 7.12.2018).

of special-purpose questionnaires. In 2018, the work which was started in the previous year on the implementation of the CRC's priority to automate the activities related to the regular collection and processing of information, continued. With CRC Decision No 89/01.03.2018, a procedure was launched for the selection of a contractor of a public procurement with subject: "Development, deployment, guarantee and maintenance of an information system of CRC for on-line completion and acceptance of questionnaires for the reporting of the activities of undertakings providing public electronic communications networks and/or services and of postal service operators", and with Decision No 269/19.07.2018, CRC selected Bul SI OOD as the contractor of the public procurement. In 2018, CRC launched, fulfilled and adopted the Stage I activities under the procurement, covering an analysis of the working processes for the collection and processing of information in CRC, definition of the system users and their roles, analysis and design of the system, analysis of the various types of system logins, and interfaces with external systems, analysis of the existing data, definition of a data pattern and migration principles, definition of architecture. According to the signed contract, the performance of the contract is expected to be completed in 2019.

Collecting information and overseeing the fulfilment of obligations arising from the Regulation on international roaming

In the first half of 2018, the EC began preparing for a review of the wholesale roaming market which will be completed by the end of 2019. In accordance with the results of the wholesale roaming market review, the EC will make, if appropriate, a legislative proposal for amendment of the maximum wholesale prices of regulated roaming services. For the implementation of the review, the EC requested from CRC to provide detailed information, including information about the undertakings, which may help the EC to prepare a cost evaluation relating to the provision of wholesale roaming services.

In 2018, CRC continued to exercise control for the implementation of the requirements of Regulation (EC) No 531/2012[65] and Implementing Regulation (EU) 2016/2286[66] in respect of the implementation of the "Roam Like At Home"[67] (RLAH) and the fair use policy[68] (FUP) introduced by undertakings, as it:

- carried out inspections on the correctness of tariffs applied by the undertakings and the compliance of the included data volumes with the requirements of the Implementing Regulation; the total number of roaming inspections was 526 in 2018;
- carried out permanent monitoring of the undertakings' offers and of the requirements for provision of transparent information to the users via all communication channels;
- collected and summarised data on the transparency and comparability of the offers for retail roaming services offered by undertakings;
- with its Decision No 310/02.08.2018, CRC obliged A1 BULGARIA EAD to amend its General Terms and Conditions governing the relationships between A1 BULGARIA EAD and the subscribers of public mobile terrestrial networks of A1 BULGARIA EAD under the GSM, UMTS and LTE standards with a view to fulfilling the Roaming Regulation's requirements;

[65] Regulation (EU) No 531/2012 of the European Parliament and of the Council of 13 June 2012 on roaming on public mobile communications networks within the Union, amended by Regulation 2015/ 2120 of 25 November 2015 and Regulation (EU) 2017/920 of 17 May 2017;
[66] Commission Implementing Regulation (EU) 2016/2286 of 15 December 2016 laying down detailed rules on the application of fair use policy and on the methodology for assessing the sustainability of the abolition of retail roaming surcharges and on the application to be submitted by a roaming provider for the purposes of that assessment;
[67] Roam like at home, RLAH;
[68] Fair use policy, FUP.

- instructed the Bulgarian roaming services providers on how to raise the users' awareness on the difference between international and roaming services.

In 2018, CRC adopted and published on its website opinions on the following roaming-related matters:

- concerning the content of messages sent to roaming customers using open data bundles upon their entry to EEA member states[69];

- concerning the application of Art. 5, Para 4 of the Commission Implementing Regulation (EU) 2016/2286 of 15 December 2016 laying down detailed rules on the application of fair use policy and on the methodology for assessing the sustainability of the abolition of retail roaming surcharges and on the application to be submitted by a roaming provider for the purposes of that assessment.[70]

While exercising the control, it was established that undertakings providing public electronic communications services via mobile networks:

- apply the Roaming Regulation rules with regard to their new tariffs in compliance with the RLAH and FUP requirements for subscription and prepaid plans with roaming included;
- fulfil the requirements for transparency and avoidance of bill shocks in compliance with the requirements laid down in Regulation (EU) No 531/2012;
- apply prices in accordance with the regulated wholesale roaming services caps laid down in Regulation (EU) No 531/2012.

1.3. Development and technical support of the National Radio Frequency Spectrum Monitoring System

In 2018, the functional capabilities of the specialised applied radio monitoring software used in stationary and mobile radio monitoring stations by the National Radio Frequency Spectrum Monitoring System for Civil Needs (NMS) were expanded. As a result, eight job openings were created for the processing of measurement results and the functional capabilities of mobile radio monitoring stations were expanded with new options, thus expanding the functional capabilities of NMS as a whole and, as a result, the efficiency in carrying out radio frequency spectrum (RFS) monitoring.

A hardware update process was launched with regard to NMS mobile radio monitoring stations with the purchase of contemporary broadband monitoring receiver integrated in one of the mobile stations.

Possibilities for NMS expansion and modernisation as well as for performance of activities relating to maintenance and prophylaxis of the used equipment continued to be explored.

Regarding the technical and technological support of the activities relating to the control and monitoring of electronic communications networks, activities relating to the maintenance of the specialised technological equipment were carried out in 2018: fixed, mobile and transportable monitoring stations, portable measurement equipment and NMS communication networks (configuration, set up and administration).

At the end of 2018, for the implementation of its control functions, CRC had at its disposal the following main measurement systems:

- 15 fixed stations for RFS monitoring (1 manned and 14 unmanned RMS) in the bands

[69] https://crc.bg/files/_bg/Stanovishte_case_MTEL_2018.pdf
[70] https://crc.bg/files/_bg/Stanovishte_case_TELENOR_2018.pdf

from 20 to 3000 MHz;

- 8 mobile stations for RFS monitoring in the bands from 10kHz/20 MHz to 3000 MHz;
- a dedicated mobile station for GSM 900/1800 and DVB-T;
- portable system for measurement of the coverage and quality of services provided within the GSM/UMTS networks;
- 2 portable systems for measurement of the coverage and quality of services provided within the GSM/UMTS/LTE networks;
- 7 portable measurement systems for measurement of the coverage and quality of the DVB-T networks;
- 7 transportable measurement systems in the bands from 1.0 to 26.5 GHz;
- 7 portable measurement systems in the bands from 9 kHz to 20 GHz;
- 7 portable measurement systems for measurement in the bands from 9 kHz to 3 GHz;
- 6 digital cable television systems meters.

1.4. International activity of CRC in 2018

The past year of 2018 was important for the Bulgarian regulator at both European and international level. The new regulatory framework was adopted at European level which will directly affect the Bulgarian electronic communications market as well as the CRC's activity. ITU Plenipotentiary Conference defined the strategic development goals for the next four years at global level.

An important part of the regulator's activity in 2018 was the CRC's presence within the specialised international and European organisations, contributing to the implementation of good international practices, exchanging of experiences and better functioning of the internal market for electronic communications networks and services.

In 2018 CRC celebrated its 20th anniversary from the establishment of the independent regulator by holding an international conference in Sofia entitled "Communications, Results, Connectivity". The conference was held in three sessions - "5G for People and Things", "Changes in the Access Regulation based on significant market power assessment and symmetric regulation", and "The difficult balance: Consumer Protection in the dynamic environment of innovations and convergence of networks and services." There were some high-level officials among the panelists - Mrs. Mariya Gabriel, Commissioner for Digital Economy and Society, the European Commission; Mr. Rosen Jeliazkov, Minister of Transport, Information Technology and Communications, Mr. Johannes Gungl, Chair of BEREC for 2018, ITU representatives for Europe, the President of PanEurope Bulgaria, chairs of the national regulatory uthorities (NRAs), representatives of operators in Bulgaria.

During the conference, a Memorandum of Understanding in the field of electronic communications between CRC and the Regulatory body Authority for Broadcasting and Telecommunications (RTR) was signed. The signing of the Memorandum was also attended by a representative of the Austrian Embassy in Bulgaria. The Memorandum establishes a mechanism for exchanging of ideas, information and experiences on issues of mutual interest in the area of electronic communications regulation in order a more effectively implement the legal powers of the two NRAs and to promote the development of contemporary communications both in the two countries and in the EU. The initiative is a continuation of the

CRC's policy for development and deepening the interaction the national regulators from the EU Member States.

Participation in the work of European structures

In 2018 CRC continued to cooperate directly with the EC structures, the Permanent Representation of the Republic of Bulgaria in Brussels, in order to protect Bulgaria's interests, through a consistent and coordinated national position on the EU legislation. In the context of amending the EU regulatory framework, CRC took part, along with the MTITC and in coordination with the Permanent Representation, in the development of Bulgaria's positions which were presented in the process of adopting the new Community rules.

CRC took part in all activities of BEREC at expert level in 2018, contributing to the development of the good regulatory practices. CRC's experts participated in the working meetings on regulatory issues , in data collection, analysis and preparation of BEREC reports.

CRC was presented at the highest level in the four regular General Assemblies of IRG and Plenary meetings of the Board of Regulators (BoR) of BEREC and the Management Committee (MC) of BEREC Office, held during the year: respectively in March in Bratislava, Republic of Slovakia, in June in Sopot, Poland, in October in Portorož, Slovenia, and in December in Prague, the Czech Republic.

In September, CRC took part in the BEREC Stakeholder Forum.

At expert level, CRC participated in the four BEREC Contact Network meetings – in February in Bonn, Germany, in May in Riga, Latvia, in September in Dublin, Ireland, and in November in Mondorf-les-Bains, Luxembourg.

In 2018 in Brussels, the BEREC training for the period 2017-2018 on the Regulatory Framework for Electronic Communications continued, in which CRC's experts took part, as the second, third and fourth sessions were held in February, March and April respectively.

At the EU level, in June 2018, CRC took part in a working meeting on subject "Europe's 5G Ambition: Harmonisation of the 5G Capabilities in the EU Member States". The meeting was organised on the initiative of Poland with the support of Bulgaria, Italy and Lithuania, and was attended by representatives of the European Commission, the European Parliament, ITU, national regulators, ministries, manufacturers, the Association of Mobile Networks Operators (GSMA), etc.

The Commission participated in a seminar dedicated to the draft guidelines of the EC on the carrying out of market analyses and designation of undertakings with significant market power (SMP Guidelines) and their accompanying document (Explanatory Note), organised by the consulting company WIK, held in March 2018.

CRC was presented, at expert level, at the working meetings of the European Network and Information Security Agency (ENISA) in connection with Art. 243 of the LEC, introducing Article 13a of the Framework Directive - in June and in November 2018.

Communication with the European Commission (EC)

In November 2018, the regular annual mission of representatives of the EC Directorate General for Communications Networks, Content & Technology, related to the preparation of the regular report for the progress in development of the electronic communications market in the Republic of Bulgaria in 2018, was held.

International Telecommunication Union (ITU)

The Chairman of CRC took part as a special guest on behalf of the Republic of Bulgaria within the High Level Track of the World Summit on the Information Society Forum (WSIS Forum), which was held in the period 19-23 March 2018 in Geneva, Switzerland.

CRC took part in the 2018 annual session of the ITU Council, which was held from 17 to 27 April 2018 in Geneva.

In the period 5-12 June 2018, a representative of the Commission took part in the meeting of ITU-R Working Party 1C Spectrum Monitoring, which was held in Geneva.

CRC was presented at expert level at the ITU Regional Development Forum for Europe, which took place on 11 June 2018 in Prague, Czech Republic.

Representatives of the Commission took part in the ITU Global Symposium for Regulators (GSR-18), which took place from 9 to 12 July 2018 in Geneva.

CRC also had its representatives at the 16th edition of the International Conference "Regulatory Activity in Electronic Communications Sector", held on 1 and 2 October 2018 in Budva, Montenegro.

In the period 28 October - 16 November 2018, the 20th ITU Plenipotentiary Conference was held in Dubai, United Arab Emirates. The Bulgarian delegation included representatives of CRC, the MTITC and the Ministry of Foreign Affairs.

CRC experts participated in the ITU World Radiocommunication Seminar, which was held in the period 03-07 December 2018 in Geneva.

The Commission took part in the 16th World Telecommunication/ICT Indicators Symposium which was held in the period 10-12 December 2018 in Geneva.

Universal Postal Union (UPU)

The two sessions of the Council of Administration (CA) of the Universal Postal Union (UPU), held in Bern, Switzerland, were attended by representatives of CRC within the national delegation of the Republic of Bulgaria.

Network of regulators of the Member States of the International Organisation of La Francophonie (FRATEL)

CRC took part in the 16th Annual Meeting of the national telecommunications regulatory authorities of the FRATEL Member States which was held in the period 22-23 November 2018 in Paris, France.

European Telecommunications Standards Institute (ETSI)

CRC took part in the 71st General Assembly of the European Telecommunications Standards Institute (ETSI) which was held in the period 17-18 April 2018 in Sophia Antipolis, France.

European Conference of Postal and Telecommunications Administrations (CEPT)

CRC participated actively in the work of CEPT working structures:

- Meetings of the Committee for ITU Policy (Com-ITU) to CEPT, 26-29.03.2018, Copenhagen, Denmark, 12-15.06.2018, Prague, Czech Republic, 18-21.09.2018, Bonn, Germany. The main task of the Com-ITU activity was the preparation for participation of the CEPT member administrations in the ITU Plenipotentiary Conference (PP-18) which was held in Dubai, United Arab Emirates, in the period 29 October - 16 November 2018;

- Meetings of the Project Team Technical Regulation & Interconnection Standards (PT TRIS) of the CEPT/ECC Working Group Numbering and Networks, 11-12.04.2018, Biel/Bienne, Switzerland, and 04-05.09.2018, Vilnius, Lithuania;

- Meetings of the ECC Working Group Numbering and Networks - CEPT/ECC/WG NaN, 29-31.05.2018, Reykjavik, Iceland, 27-29.11.2018, Sofia, Bulgaria;

- Meetings of the Electronic Communications Committee (ECC), 03-06.07.2018, Rome, Italy, and 23-26 October 2018, Bordeaux, France;

- Meeting of the ECC Working Group Frequency Management - CEPT/ECC/WG FM, 14-18.05.2018, Pratteln, Switzerland;

- Plenary session of the European Committee for Postal Regulation (CERP), 18-19.06.2018, Copenhagen, Denmark;

Bilateral and regional cooperation and other significant international events

In 2018, CRC continued the tradition of developing and deepening the bilateral cooperation. The Chairman of CRC held a working visit to the Agency for Electronic Communications (AEC) in the Republic of Northern Macedonia in February. CRC members participated in the Annual International Regulatory Conference of the Macedonian regulator AEC which was held in the period 14-16 May 2018 in Ohrid. Representatives of CRC also participated in the international conference Evolving Regulatory Frameworks for Digital Future which was held within the framework of the 25th Festival of the ICT Achievement (INFOFEST 2018) in October in Budva, Montenegro.

The active international activity of CRC in 2018 has contributed to the enhancement of the international reputation of the Bulgarian national regulator, strengthening of the administrative capacity and creating new contacts. As a result of its participation at both high and expert level, CRC has been able to contribute to the discussions on a number of crucial issues and to participate directly in the decision-making process. CRC derived good practices and ideas from such participation ofin order to of implementing and adapting them to its activity.

CRC was directly involved in the preparation of reports, such as the evaluation of the Net Neutrality Regulation, and a report on the results of the public consultation on the evaluation of the implementation of the Net Neutrality Regulation and the BEREC Net neutrality Guidelines, a report on updating the common positions on Markets 3a, 3b and 4, an analysis of the technical and economic replicability assessment in the context of symmetric access, BEREC Guidelines on the location of the network termination point, on monitoring mobile coverage, BEREC Common Position on monitoring mobile coverage, Common position on mobile infrastructure sharing.

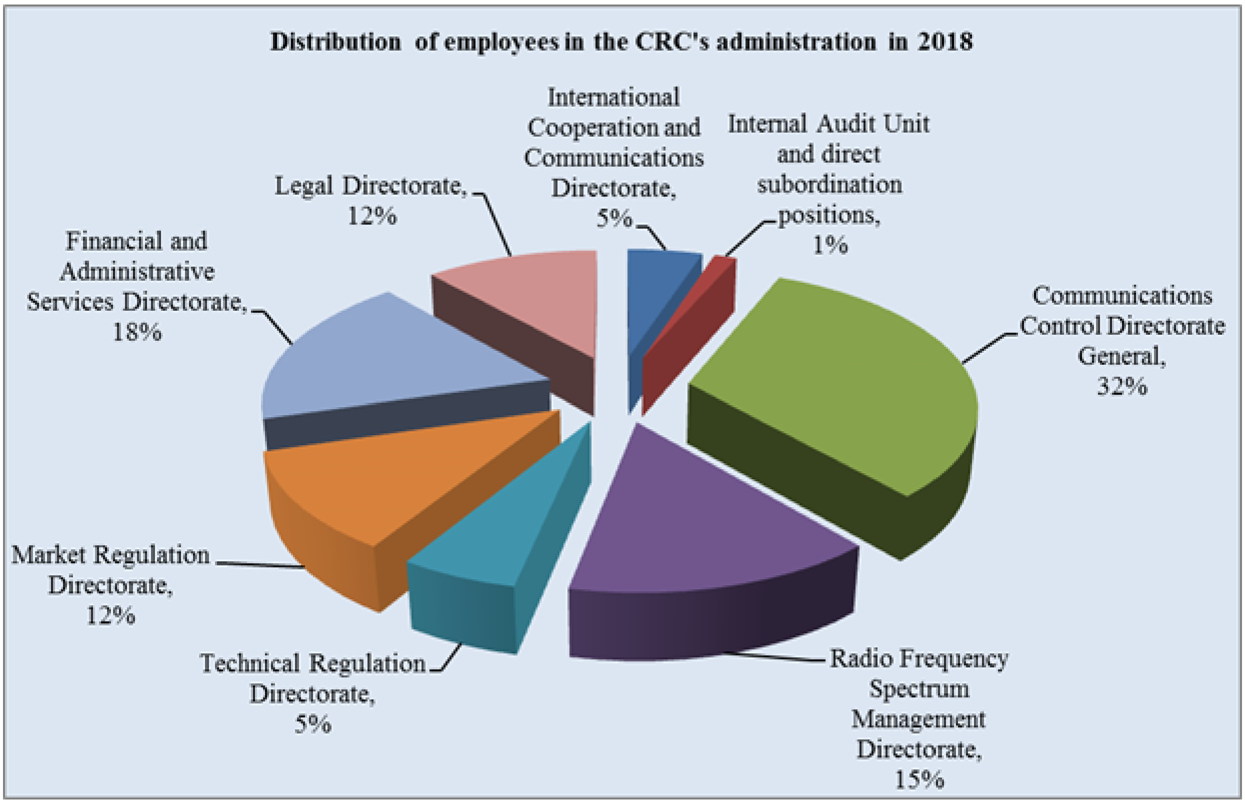
1.5. CRC's administrative capacity

The strengthening of the CRC's capacity ensures the establishment of a professional, responsible and citizen-oriented administration enjoying a high public profile.

In 2018, CRC performed its functions with the following distribution of employees:

• Internal Audit Unit	1
• Direct subordination positions	2

- International Cooperation and Communications Directorate 10
- Legal Directorate 23
- Communications Control Directorate General 64
- Radio Frequency Spectrum Management Directorate 29
- Technical Regulation Directorate 11
- Market Regulation Directorate 23
- Financial and Administrative Activities Directorate 36

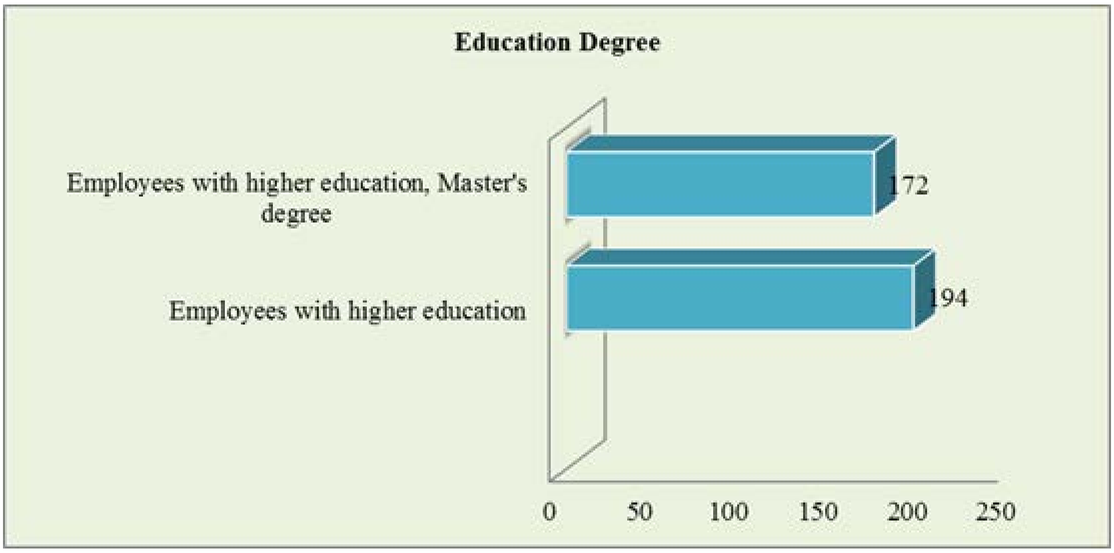


Source: CRC

Figure 41

The total number of CRC's staff was 255 full-time employees.

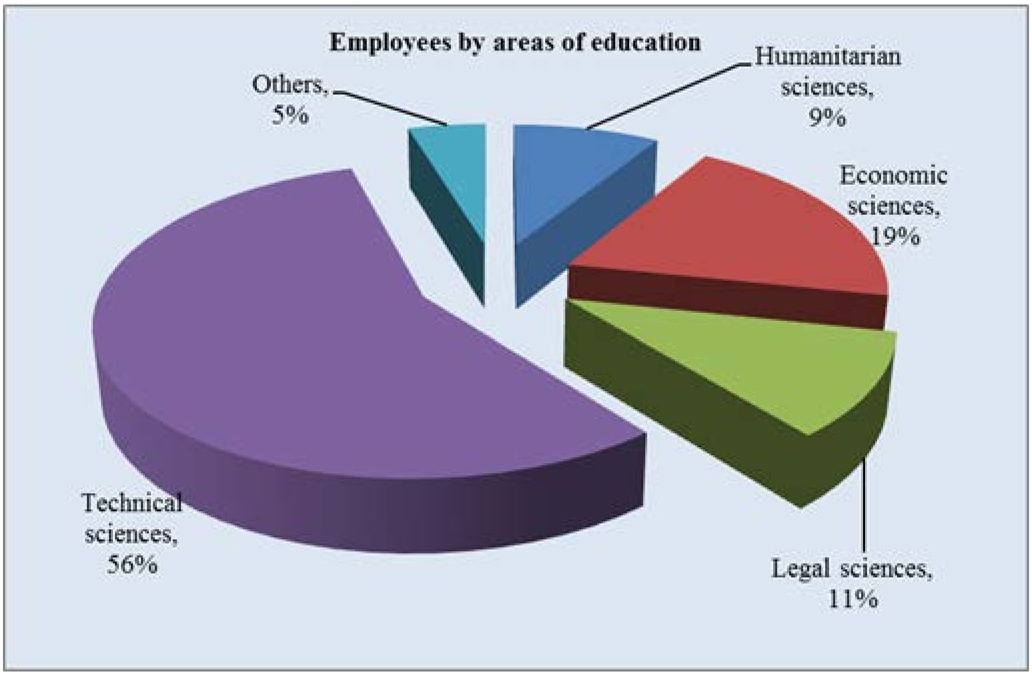
Most of the staff members fell within the age category from 30 to 59 years, inclusive. Of the total number of CRC employees, 194 had higher education, as 172 of them had a Master's degree (Fig. 42).



Source: CRC

Figure 42

The allocation of employees according to their education is in the following areas – technical sciences; legal sciences; economic sciences; humanitarian sciences and others (Fig. 43).



Source: CRC

Figure 43

Recruitment of employees in the Commission's administration takes place in accordance with the Law on Civil Servants (LCS), the Ordinance on Recruitment Procedures for Civil Servants, and the Internal Rules.

In 2018, according to the regulatory requirements, 23 competition procedures were organised and conducted at CRC and, as a result, 17 new employees were appointed by the end of the year, while three employees were transferred from other administrations pursuant to the provisions of Art. 81a of the LCS. The number of employees who left CRC for the same period was 12.

Presently, remunerations are determined in accordance with the Ordinance on the Salaries of Civil Servants laying down the procedures for their increase depending on their annual assessments pursuant to the Regulation on the conditions and procedure for assessing the performance of civil servants.

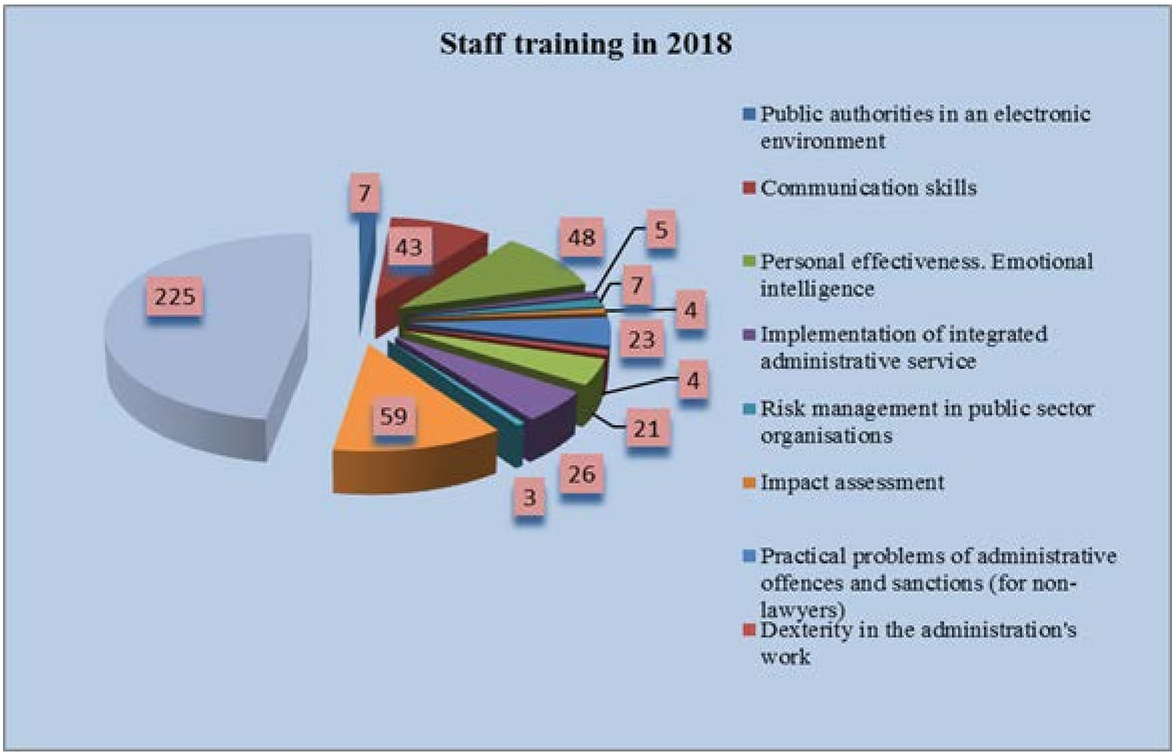
The implementation of the Programme for Motivation and Raising the Commitment of CRC employees, which was created in 2017 and updated in 2018, continued.

It involved mechanisms for the conduct of team training and specialised training courses.

To maintain the current knowledge and to acquire new one, CRC also participated in a project of the Institute of Public Administration on subject "Working for the People - Strengthening Institutional Capacity to Meet the Challenges of Modern Public Policies” under the Operational Programme “Good Governance”, as 191 employees were trained. Except in the project above, CRC also took part in training organised by external specialist organisations.

In 2018, the courses and seminars, as well as the number of participants in them, was as follows:

- Public authorities in an electronic environment 7
- Communication skills 43
- Personal effectiveness. Emotional intelligence 48
- Implementation of integrated administrative service 5
- Impact assessment 4
- Practical problems of administrative offences and sanctions (for non-lawyers) 23
- Dexterity in the administration's work 4
- Application of the Public Procurement Act 21
- Interoperability and information security 3
- Highly specialised training courses 59
- Specialised seminars 225



Source: CRC

Figure 44

In order to increase the effectiveness and efficiency of the training courses, their effect is regularly analysed by studying the training satisfaction, the extent of knowledge acquired during training, and the change in the professional conduct.

Ensuring health and safety at work is part of the process for improving the working conditions. In this connection, risk assessment at work as well as employee examinations for prevention and prophylaxis are carried out on a regular basis. The priority arrangement of the objectives of the HESA policy is based on an assessment of the balance between the regulatory requirements, the magnitude of the risk, and the available resources.

2. Other important activities

2.1. Standardisation

In compliance with Art. 30, item 22 of the LEC, CRC performs the functions of the National Standardisation Organisation (NSO) for the European Telecommunications Standards Institute (ETSI) and takes an active part in the work of the Technical Committees (TCs) for Standardisation (TC 47, TC 57, TC 75, TC 80) of the Bulgarian Institute for Standardisation (BDS), having relation to electronic communications.

In 2018, CRC took part in the ETSI procedures, as follows:

Table 18

Procedure	Number of processed	Number of

	documents	procedures
Vote (TAP) – Voting (two-step procedure)	**7**	**5**
ENAP – One-step procedure	**58**	**36**
MV – Member voting	**20**	**9**
Withdrawal	**–**	**–**
PUB – All published documents	**2,717**	

By publishing draft standards and standardisation documents of ETSI on the different procedures on its website, CRC provides opportunity for all stakeholders in the Republic of Bulgaria to give their opinions and comments within the specified time limits.

The translation of the titles of draft ETSI harmonised standards are timely prepared and agreed on an ongoing basis by correspondence at TC of BDS. Over the past year, 59 ETSI EN standards and and 1 ETSI/TS standardisation document were introduced by endorsement as Bulgarian standards and were published in the BDS Official Bulletin.

CRC notifies ETSI electronically for the national BDS EN standards published by BDS introducing the relevant ETSI EN standards.

2.2. Performance of obligations related to Chapter 15 of the LEC

In 2018, CRC received one notification of an incident which meets the conditions for incident reporting in accordance with the criteria laid down by the Commission in the General Requirements for Provision of Public Electronic Communications. In this regard and in performance of its obligation under Art. 243b, Para 5 of the LEC, CRC prepared and sent to the EC and to ENISA the annual report for the received notification.

In 2018, ENISA prepared Guidelines on assessing security measures in the context of Art. 3 Para 3 of Regulation (EU) 2015/2120. The development of this paper was based on a survey which was addressed, among others, to Bulgarian undertakings.

2.3. Electronic trust services

In fulfilment of its powers under Electronic Document and Electronic Trust Services, in 2018, CRC granted a qualified status to the trust services providers InfoNotary EAD and SEP Bulgaria AD and to the trust services provided by them. The Commission granted a qualified status to the qualified validation of qualified electronic signatures/ seals service provided by Evrotrust Technologies AD. CRC maintains an up-to-date national trusted list that contains information about the qualified trust services providers and the services provided by them.

During the past year, an increase was observed in the provided trust services compared to 2017 - the total number of the issued certificates for qualified electronic signature was over 246,000, and for electronic seals - about 40. The issued qualified electronic time stamps were above 8,650,000, and the qualified certificates for website authentication - over 45.

In August 2018, on a proposal by CRC, the Council of Ministers adopted an Ordinance on liability and termination of the activities of trust services providers.

2.4. Communications control

In 2018, the control carried out by CRC on the entire territory of the country regarding compliance with the LEC and the secondary legislation requirements in the area of electronic communications was traditionally focused on protecting the interests of end-users in accordance with the principles of legality, non-discrimination and transparency. For the fulfilment of its control functions, the Commission has built a territorial structure - a central unit in the city of Sofia and five regional units in the cities of Plovdiv, Burgas, Varna, Veliko Tarnovo and Vratsa.

2.4.1. Monitoring and control of the radio frequency spectrum for civil needs

A periodic preventive control of RFS for civil needs is carried out through NMS consisting of fixed and mobile stations. The objective is to ensure appropriate conditions for the provision of electronic communications to the lawful spectrum users and to ensure a certain quality of services provided through them to end-users.

As the number of users of services provided by the use of RFS grows, there is also an increase in the substantial role of RFS monitoring and control in respect of effective management by ensuring up-to-date data about its actual occupancy.

To ensure the normal operation, without the presence of harmful interference of the established radio networks in the current workload of the spectrum, it is necessary to carry out continuous monitoring and control in order to timely locate and eliminate the sources of interference and identify illegal radio broadcasting means.

In 2018, the main activities in the area of RFS monitoring and control were:

2.4.1.1. Protection of the interests of end-users - setting up conditions for the normal work of lawful spectrum users; guaranteeing a certain quality of services provided to end-users, as well as preventing the occurrence of illegal broadcasting through the exercise of preventive and follow-up control.

Typical for 2018 was the enhanced role of preventive RFS control, as a result of which about 20% less prescriptions were given for established deviations from the technical parameters in comparison with 2017. The undertakings were provided, by electronic means, with the results of the ongoing monitoring for the performed 13,581 measurements of basic technical parameters of the radio stations. As a result of the preventive control, the steady trend towards maintaining the parameters of broadcast radio signals within norms and reducing the generated out-of-band and intermodulation emissions, including in the range of the aeronautical service, was preserved.

2.4.1.2. Control regarding conformity with the rules for the use of radio frequencies and radio frequency bands for civil needs

A scheduled daily monitoring was carried out in the 20-3000 MHz frequency band through fixed (manned and unmanned) stations for radio monitoring by NMS on the territory of serviced areas, and through mobile stations for radio monitoring – periodic control and monitoring throughout the country.

2.4.1.3. Monitoring and control of the conformity of the established broadcasting stations for analogue terrestrial broadcasting of radio signals and digital terrestrial broadcasting of television signals with the approved technical characteristics

- measurements of basic technical parameters of 32 broadcasting stations were carried out in fulfilment of CRC's decisions to assess their compliance with the approved technical specifications; CRC found that all broadcasting stations had fulfilled CRC's decisions.
- compliance with the terms and conditions of the authorisations for radio and TV broadcasting stations - 383 inspections were carried out and 76 prescriptions were given for deviations from the technical parameters; the control inspections established that all prescriptions given have been fulfilled.

2.4.1.4. Monitoring for evaluation of the electromagnetic environment

- *VHF frequency ranges for radio and television broadcasting for evaluation of the electromagnetic environment and cross-border interferences*

In border country areas, annual measurements are conducted in order to assess the penetration of signals from neighbouring countries. All data obtained from the measurements are analysed for compliance with the protection ratio between the EMF intensity of broadcasting transmission stations (under Rec. ITU-R BS. 412). In 2018, measurements carried out in the territory of 46 settlements to assess the electromagnetic environment and register cross-border penetration from the territories of Turkey, Serbia, Romania, Ukraine, Russia, Republic of Northern Macedonia and Greece were summarised and analysed. The results were included in the drafted 446 measurement reports.

In the summer months, when penetration of cross-border broadcasts along the Bulgarian Black Sea coast intensifies as a result of the influence of the ambient temperature, the sea water temperature, and the state of the sea, electromagnetic environment and cross-border penetration are carefully monitored. Regular measurements were carried out in 10 settlements along the Black Sea coast, as the analysis of the results did not register any interference to the Bulgarian broadcasting stations in their areas of service. The trend for registration of relatively low levels of received cross-border signals from the Turkish broadcasting stations was preserved.

In support of the spectrum management, measurements are carried out annually in different settlements in the country to assess the electromagnetic environment. In 2018, measurements were carried out in 24 settlements and their results were included in 361 measurement reports.

- *monitoring of frequency ranges intended for mobile PMR networks* - evaluation of the actual RFS occupancy and registration of illegal broadcasting

Monitoring on the territory of 37 settlements was carried out through the radio monitoring stations (fixed and mobile). The results of the monitoring were summarised in 296 measurement reports.

- *evaluation of the electromagnetic compatibility of VHF/FM radio broadcasting stations in the 87.5÷108.0 MHz band and the radio navigation and communication equipment of the aeronautical services operating in the 109÷137 MHz frequency band.*

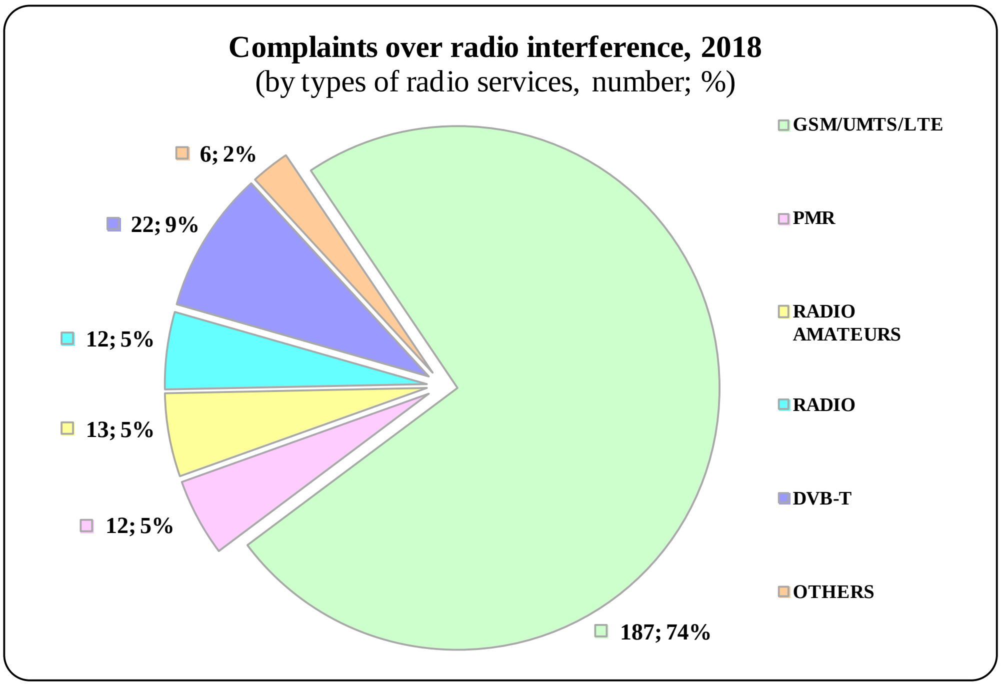
Measurements of 12 radio broadcasting stations were carried out to guarantee the electromagnetic compatibility and trouble-free operation of the radio navigation and communication equipment of the aeronautical services. Measurements were carried out according to the Methodology for measuring intermodulation products of type "A1", occurring during the operation of closely situated VHF radio broadcasting stations (according to point 2.5. of Appendix 1 to the Technical requirements for operation of the electronic communications networks of the Radio broadcasting service and the related equipment).

2.4.1.5. Monitoring and control over the quality of provided services with a view to the protection of public and consumer interest

– monitoring with regard to complaints received from lawful spectrum users, citizens, organisations and institutions.

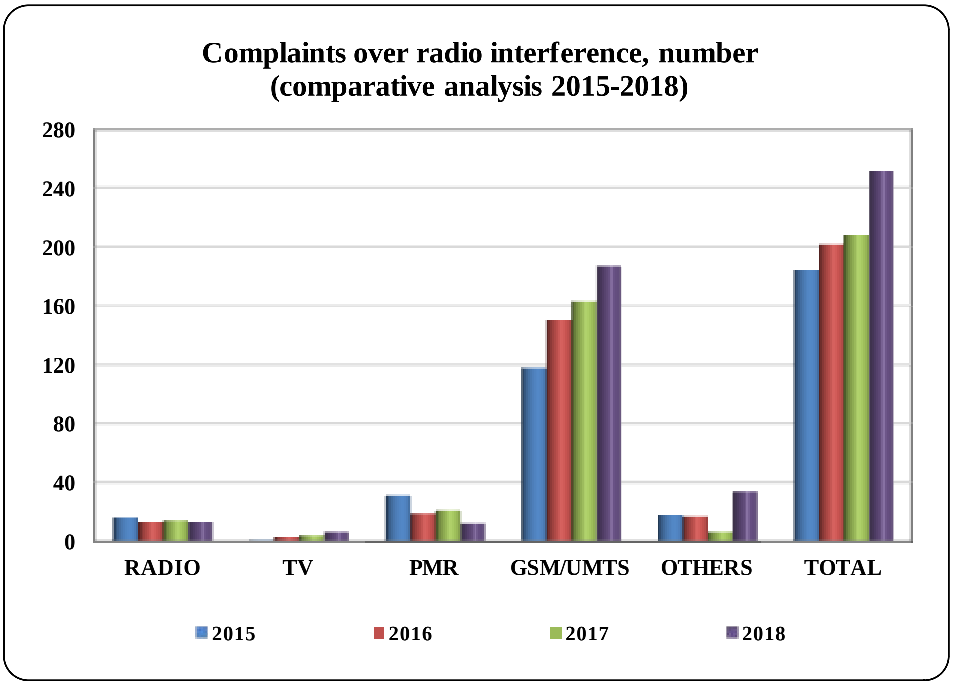
In 2018, 252 cases of radio interference were examined (Fig. 45), and the results were included in 275 measurement reports. To quickly locate and timely eliminate the sources of interference, the necessary measures were taken. The interferences from radio frequency jammers transmitting in frequency ranges intended for public electronic communications through mobile terrestrial networks had a relatively high share in 2018. The next place was occupied by cases of registered interferences from defective (household and network) equipment in the frequency ranges intended for public electronic communications through mobile terrestrial networks.

Radio interferences resulting from electromagnetic incompatibility and mutual interferences as a result of the shared use of different technology in bands designated for the operation of mobile terrestrial radio networks continued. A comparative analysis of the solved cases of interference in connection with the received complaints, by types of services for the period 2015-2018, is presented on Fig. 46.



Source: CRC

Figure 45



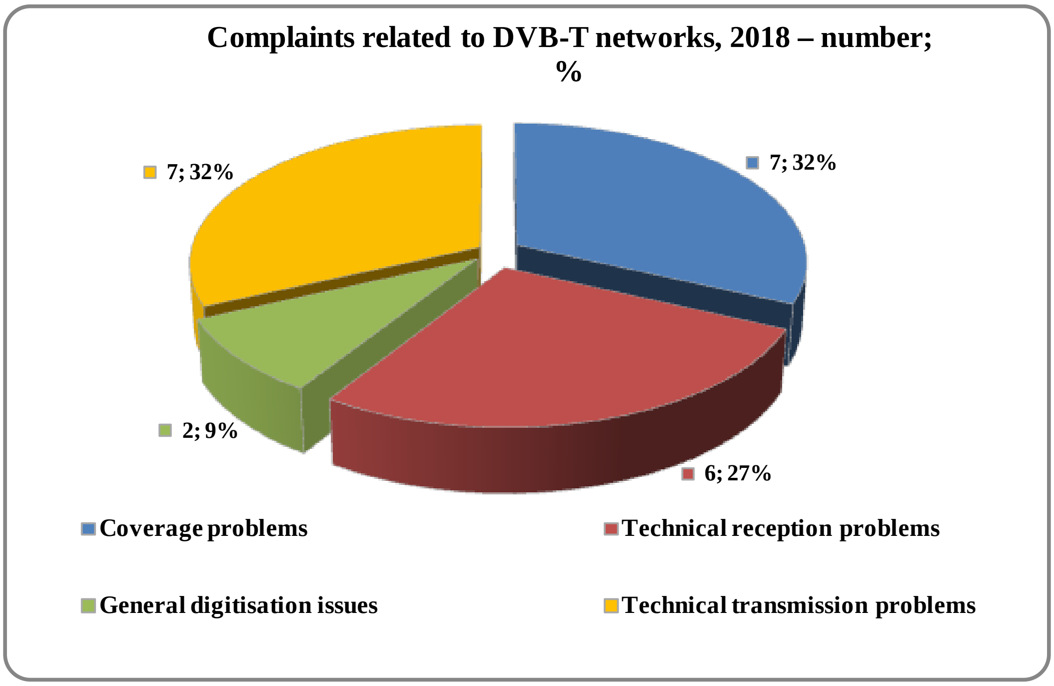
Source: CRC

Figure 46

– monitoring and inspections concerning received complaints and tips related to the ensured coverage of terrestrial digital television of DVB-T standard:

▪ measurements and inspections were carried out under 22 complaints and tips submitted by complainants and forwarded by other institutions (CEM, MTITC, etc.);

▪ 77 measurement reports were drawn up for the results of scheduled measurements and inspections under complaints - analysis of the results of the inspections in connection with complaints concerning coverage problems of electronic communications networks under the DVB-T standard is presented in Fig. 47.



Source: CRC

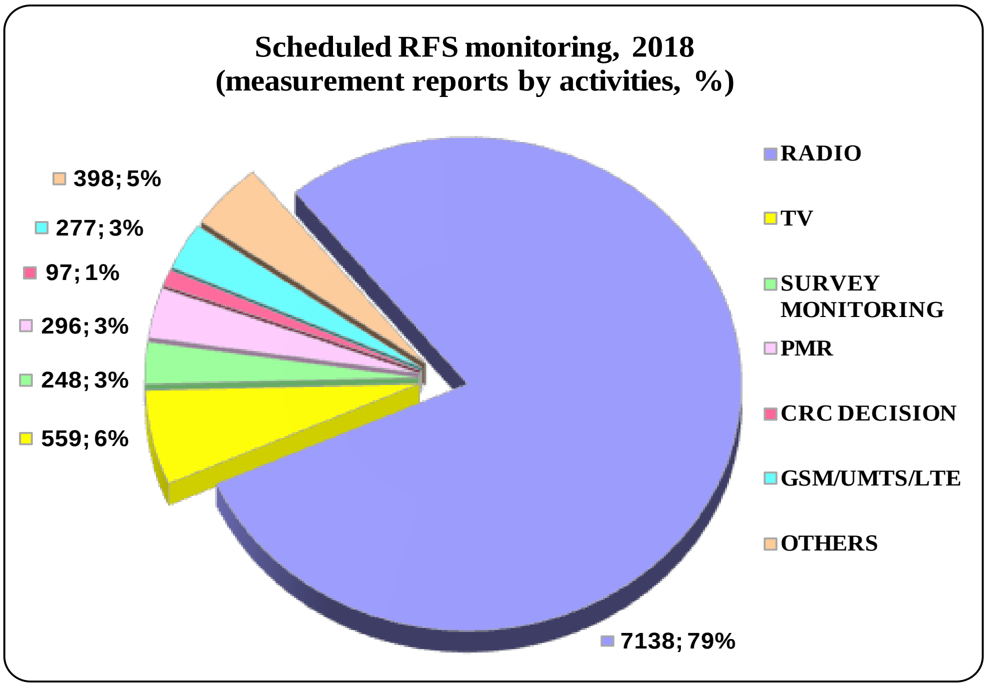
Figure 47

- coverage of mobile terrestrial networks

In connection with the received 25 complaints about the lack of coverage of GSM/UMTS/LTE mobile terrestrial networks in 2018, an analysis was made and 118 measurement reports and 638 opinions were drawn up on the coverage declared by the undertakings on the official websites of the undertakings for the settlements which were the subject of complaints received by the Commission.

Scheduled measurements of the coverage and quality of GSM/UMTS/LTE mobile networks were carried out in 87 settlements and were included in 261 measurement reports.

The results from the RFS monitoring and control carried out in 2018 were summarised in 9,406 measurement reports, and 9,013 measurement reports were drawn up for the conducted scheduled monitoring, the analysis of which, by types of activities, is presented in Fig. 48.



Source: CRC

Figure 48

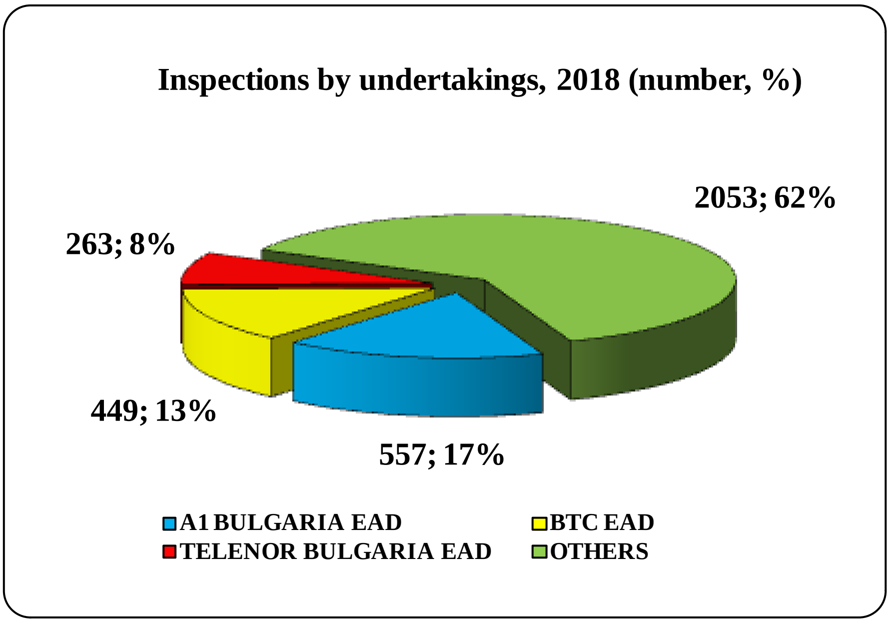
2.4.2. Inspection activity

In 2018, in connection with the CRC functions related to the control over electronic communications provision pursuant to the LEC, the following main activities were carried out:

In 2018, 3,322 inspections were carried out with regard to: implementation of CRC decisions; compliance with the provisions of the authorisations issued; provision of the services without notice/authorisation; non-provision of information to CRC; inspections based on risk analysis; inspections for radio interferences; inspections concerning coverage of mobile terrestrial networks and coverage of digital television networks, etc.; inspections with relation to submitted complaints and tips related to: problems with the use of mobile services in roaming; compliance with the requirements of Chapter 14 and Chapter 15 of the LEC; compliance with the general requirements for the provision of the public electronic communications; sending of unsolicited messages for the purposes of direct marketing and advertising by the undertakings without the prior consent of the consumers; non-provision of itemised bills to end-users;

portability of geographic and mobile numbers; problems with the coverage and quality of the service provided to end-users, etc.;

The main share (around 38%) of inspections were carried out of the three largest undertakings providing electronic communications services (Fig. 49). Some 1,269 inspections were carried out in connection with complaints submitted to CRC by end-users concerning the services offered, inspections concerning the ensured coverage and quality of the services provided by the mobile terrestrial networks under the GSM/UMTS/LTE standard, as well as inspections in connection with complaints received for radio interference: A1 BULGARIA EAD - 557 inspections, BULGARIAN TELECOMMUNICATIONS COMPANY AD – 449 inspections, and TELENOR BULGARIA EAD – 263 inspections.



Source: *CRC*

Figure 49

In 2018, significant attention was once again paid to the observance of the LEC requirements in respect of the **protection of the interests of end-users**, the more important groups of inspections being as follows:

- Inspections related to the **protection of the interests of end-users:**

▪ **problems with the use of roaming mobile services** - the greatest number of inspections (by about 46% more than in 2017) were carried out in respect of problems with used roaming mobile services - 526 inspections, of which to the BULGARIAN TELECOMMUNICATIONS COMPANY EAD - 191 (36%), A1 BULGARIA EAD - 175 (33%) inspections, and TELENOR BULGARIA EAD - 160 (31%) inspections; 18 administrative offence acts (AOAs) were drawn up for established violations.

▪ compliance with the requirements of **Chapter 15 of the LEC** in respect of **user data protection** - reduction in the number of complaints received regarding compliance with the requirements of Chapter 15 of the LEC was reported, as 227 inspections were carried out concerning:

- sending of **unsolicited messages for the purposes of direct marketing** and advertising without the prior consent of the users as well as problems in the use of value-added services - about amounts charged when registering in games, quiz games, purchase of information and entertainment contents and other Information Society Services - 166 inspections were carried out;

- free-of-charge **provision of itemised bills** for services used – 61 inspections were carried out;

For ascertained violations of Chapter 15 of the LEC, in 2018, 14 administrative offence acts (AOAs) were drawn up.

- Compliance with the requirements of **Chapter 14 of the LEC** concerning the contracts signed with undertakings providing electronic communication services: requisites of the offered individual contracts, terms and conditions of the provided services, prices of the provided services, price packages or tariffs and conditions for their use, general terms and conditions of the individual contracts, etc. - an increase was registered in the number of received complaints under which 172 inspections were carried out (twice as much as in 2017).

For ascertained violations of Chapter 14 of the LEC, in 2018, 10 AOAs were drawn up.

- **dispute of bills and charged penalties** - in 2018, there was a decline in the number of complaints received in connection with dispute of bills and charged penalties; a total of 92 inspections were carried out.

- Inspections concerning the compliance with the **General Requirements** in the provision of public electronic communications. For ascertained violations of the General Requirements in provision of public electronic communications, in 2018, 19 AOAs were drawn up.

- Inspections related to solving problems in the **number portability** implementation in case of changing the telephony service provider - in 2018, 55 inspections were carried out under complaints related to obstructing the users' right to portability of mobile and fixed numbers, and 11 AOAs were drawn up.

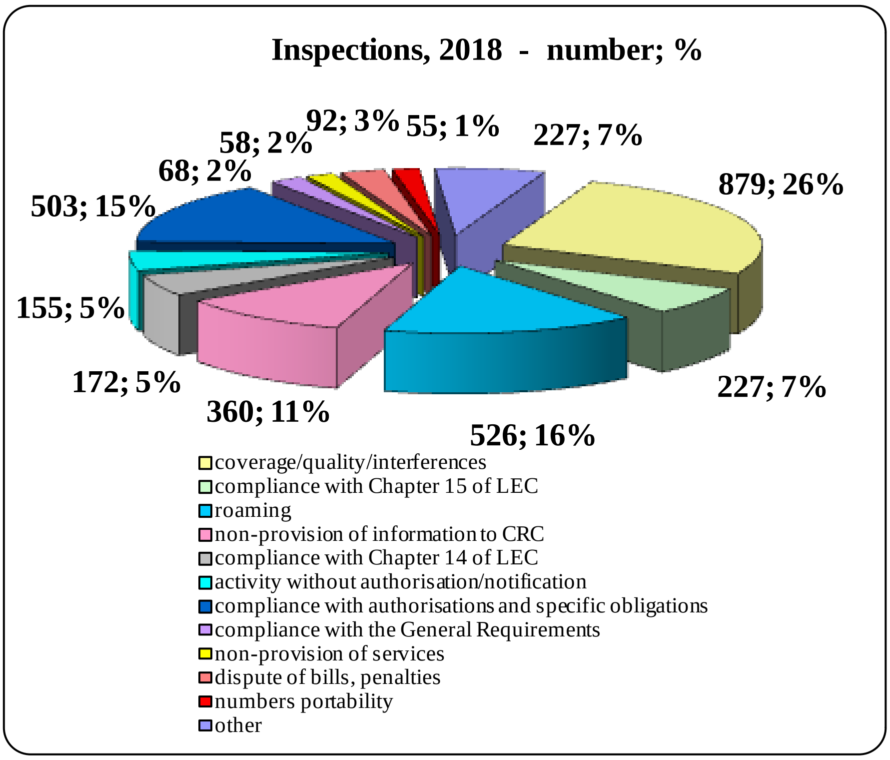
- Inspections on **compliance with the authorisations' conditions and CRC decisions** - in 2018, 503 inspections were carried out on compliance with the authorisations' conditions, implementation of CRC decisions, compliance with specific obligations and inspections of electronic communications networks for analogue terrestrial broadcasting for compliance of the transmission stations with the technical characteristics approved by CRC. For ascertained violations, 23 AOAs were drawn up.

- Inspections of undertakings for **non-provision of information to CRC** - in 2018, 360 inspections were carried out of undertakings that have failed to provide information or have provided incomplete or inaccurate information, and 164 AOAs were drawn up.

- Inspections under complaints on **coverage and quality of the services provided from mobile terrestrial networks** under the GSM/UMTS/LTE standard and DVB-T networks, as well as inspections regarding **complaints over radio interferences** – a total of 411 inspections were carried out.

In 2018, around 33% or 1,080 of the inspections performed were **on the basis of risk analysis** – inspections regarding the provision of electronic communications by undertakings that have submitted notifications to CRC to terminate their activity, inspections regarding the performance of activity after revoked and terminated authorisations or expired authorisations, inspections of coverage and quality of DVB-T networks and mobile terrestrial networks. For ascertained violations in the inspections carried out on the basis of risk analysis, 19 AOAs were drawn up.

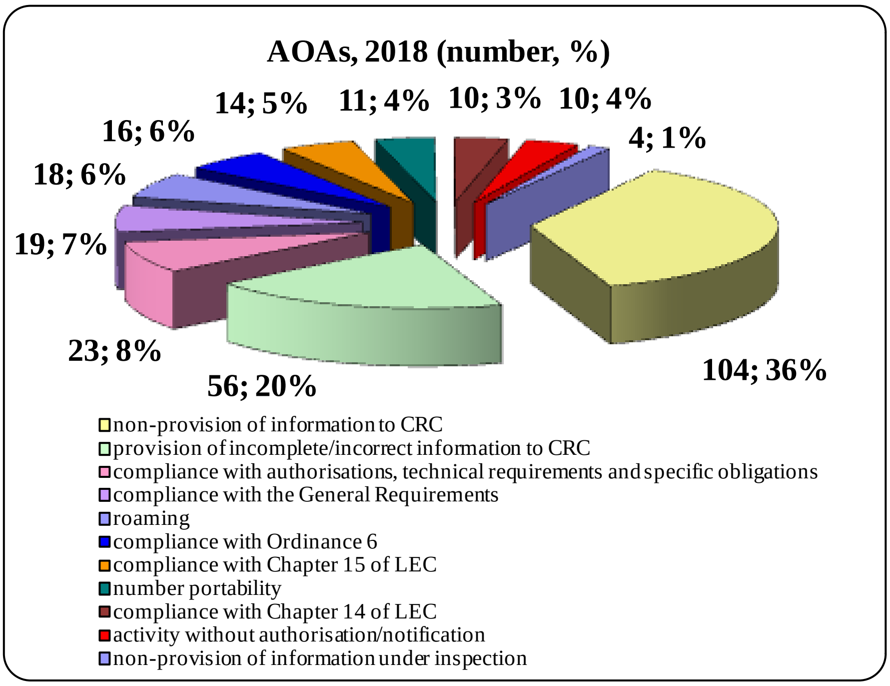
Summarised data for the performed control activity and the engaged administrative and punitive liability in offences of the LEC and secondary regulations in 2018 are displayed in Figures 50 and 51.



Source: *CRC*

Figure 50

As a result of the inspections, for the administrative violations of the LEC found, 285 **administrative offence acts** were drawn up in 2018, as the main share (36%) was once again held by non-provision of information to CRC.



Source: *CRC*

Figure 51

2.5. Quality of Internet access service and net neutrality

In order to monitor the implementation of the obligations laid down in Regulation (EC) 2015/2120 (the Regulation) on safeguarding open Internet access and applied traffic management practices by Internet Service Providers , CRC prepared an additional form to the questionnaires intended for annual reporting of the undertakings' activities in 2017. On the basis of the information collected through the questionnaires, CRC prepared its latest annual report (for the period 30 April 2017 - 30 April 2018), which reflects the observations, the findings and the actions of the Commission relating to the implementation of the Regulation by the Internet access providers. The report was sent to the EC, BEREC, and was published on the CRC's website.

An analysis was made of the results of the public consultations conducted by Decision No 620 of 14.12.2017 in connection with the prepared draft position through which CRC expresses its understanding of the application and the manner in which the requirements of Article 3 and Article 4 of the Regulation should be fulfilled. Taking into account the opinions of the undertakings, amendments were made to the draft position and, as a result, a second public consultation procedure was launched. Finally, the position was adopted by CRC in April 2019.

In 2018, CRC inspected three cases related to the fulfilment of the obligations for transparency provided for in Article 4(1)(b) and 4(1)(e) of the Regulation. In all of these cases, the minimum envisaged property sanction of BGN 500 was imposed. At the first instance, the court disallowed one of the penal decrees and confirmed the other two. All decisions of the first instance courts were appealed before the Court of Cassation and the three penalty orders were finally confirmed.

CRC adopted a decision in respect of the zero-raiting offer of Telenor Bulgaria, thus o imposing the Internet provider to provide and publish information about which features and services of Facebook and WhatsApp are with zero price as well as the terms and conditions which are applicable to this zero-raiting offer, and to inform the subscribers. The decision was not appealed.

2.6. Protection of the interests of the electronic communication services users

In 2018, a total of 2,935 complaints were filed with CRC by users against different undertakings providing electronic communication services. CRC received 37 inquiries under the LEC.

In 2018, a decline of approximately 30% was observed in the number of complaints submitted as compared to 2017.[71]

The consumer complaints concerned the following:

- cable damages - 3 complaints;
- credit limit - 30 complaints;
- quality of telephony service/fax - 1 complaint;
- mobile networks coverage - 98 complaints;
- quality of the "Internet access" service - 63 complaints;
- unfair trade practices - 85 complaints;
- lack of fixed telephony service - 16 complaints;
- complaints under Article 231 of the PPA - 41 complaints;
- complaints about tariffing of mobile telephony services - 7 complaints;
- incompetent service - 162 complaints;
- non-provision of itemised bills - 22 complaints;
- termination of contract - 168 complaints;
- complaints over bills - 444 complaints;
- contract termination (Art. 229a of the LEC) - 29 complaints;
- contract termination (Art. 228, Para 3 and Para 5 of the LEC) - 28 complaints;
- receiving unsolicited trade messages - 66 complaints;
- geographic number portability - 4 complaints;
- mobile number portability - 20 complaints;
- distance contracts - 25 complaints;
- collecting of liabilities by collection companies - 59 complaints;
- roaming - 122 complaints;
- border area roaming - 34 complaints;
- contractual relations - 257 complaints;
- bills for mobile Internet use - 113 complaints;
- locked telephone device - 3 complaints;

[71] In 2017, the complaints received by the Commission were 4,205.

- quality of the television service - 19 complaints;
- mobile Internet quality - 29 complaints;
- prepaid service issues - 25 complaints;
- complaints over electronic emissions - 6 complaints;
- complaints under Art. 40 - Art. 41 of the General Requirements - 1 complaint;
- complaints under Art. 42 - Art. 45 of the General Requirements - 52 complaints;
- complaints under Art. 46 - Art. 48 of the General Requirements - 26 complaints;
- complaints under 49 of the General Requirements - 3 complaints;
- complaints under 49a of the General Requirements - 4 complaints;
- telephone frauds - 1 complaint;
- complaints concerning constructed electronic communications networks - 26 complaints;
- roaming bills - 252 complaints;
- ambiguity in contractual terms - 13 complaints;
- complaints concerning value-added services - 23 complaints;
- non-provision of mobile telephony service - 5 complaints;
- quality of mobile telephony service - 5 complaints;
- non-provision of itemised bill - 19 complaints;
- other complaints - 165 complaints;
- activation of an unsolicited service - 2 complaints;
- penalties - 73 complaints;
- unsolicited services - 213 complaints;
- failure to provide a contracted service - 73 complaints.

The trend for a considerable part (about 1/3) of complaints received during the year to concern matters that fall outside the control and regulatory powers of CRC,[72] continued. In these cases, the regulator requested an opinion from the relevant undertaking with the purpose of providing assistance to the affected end-user.

Most of the opinions requested by the Commission were in favour of the complainant, which has led to the settlement of the dispute.

A number of complaints were forwarded by competence to other state bodies (Commission for Consumer Protection,[73] National Construction Supervision Directorate, Commission for Personal Data Protection, Ministry of Health, Prosecutor’s Office of the Republic of Bulgaria, etc.).

[72] Termination/amendment of individual contracts, dispute of monthly bills, complaints from the customer service provided, charging of penalties, etc.
[73] Complaints concerning unfair trade practices, unsolicited services and other complaints concerning the Law on Consumer Protection

2.6.1. Amendments and supplements to the General Requirements for the provision of public electronic communications (the General Requirements)

By Decision No. 418 of 11.10.2018, the Commission adopted amendments and supplements to the General Requirements in the part protecting the interests of end-users as well.

Amendment to Art. 42, Para 2 of the General Requirements - aims to provide additional opportunities for the conclusion of contracts in a durable medium other than paper. The concept of "durable medium" is defined in the Law on Consumer Protection. The relevant amendments stimulate the introduction of new ways for negotiation and implementation of innovative approaches and the use of new digital tools and instruments, which is in the interest of the general public. The creation of such opportunities is to the benefit of users who will be considerably facilitated in the conclusion of contracts.

Amendment to Art. 43 of the General Requirements - aims to simplify the contracts for electronic communications services and to facilitate the process of conclusion of such contracts as well as to ensure compliance with the General Data Protection Regulation. With the abolition of Para 11 of Article 43 and with the creation of a new Article 43a, a new procedure was established for the documentation in the exercise of the right of subscribers to declare their willingness to not receive itemised bills.

With the adoption of the new Para 3 of Article 44 of the General Requirements, an exception was introduced from the requirements for the layout of the place intended for the subscriber’s signature when concluding a contract in cases where such contracts are signed by the parties with the use of electronic signatures. The relevant amendment aims to facilitate the process of conclusion of contracts by electronic means.

The amendments to Article 47, Article 48a and Article 49, Para 5 of the General Requirements aim to provide additional opportunities for communication between users and businesses with a view to the development of technology, at guaranteed consumer protection.

2.6.2. Amendments and supplements to the functional specifications under Art. 134 of the Law on Electronic Communications (the Functional Specifications)

With Decisions No 272, 273 and 274 of 19.07.2018, the Commission launched procedures for public discussion of the draft decisions for amendments and supplements to the Functional Specifications. In the framework of the launched procedures, the Commission proposed amendments concerning the protection of the rights and interests of subscribers within the number portability procedure.

Expressly introduced was the requirement for the subscriber/user to sign individual contract when submitting an application for portability as well as for the undertaking to provide SIM card/s/ in numbers corresponding to those of the numbers referred to in the application. In the case that the actions described above are not carried out, the receiving provider is obliged to stop the procedure for a period of up to 30 days until such failure is rectified. The purpose of the amendment is to end the practice of some providers to launch the portability procedure without the presence of a contract concluded between the receiving provider and the subscriber, and without providing the relevant SIM cards to the latter, respectively. Such a procedure appears to be irrelevant and to the detriment of the subscriber/user. This is so because, for the ported number to be actually used, grounds must have occurred (concluded contract/provided SIM card with activated certain services).

An obligation is envisaged for the receiving provider not to include in the contract with the subscriber clauses obligating them to conclude a contract for numbers beyond the ported ones. Such a relationship can only occur as a result of the freely expressed will between the parties (by mutual consent), and not as an imposed obligation the breach of which would give rise to penalties. The obligation is provided for since CRC has established the implementation of such practices by certain providers to the detriment of the rights and interests of end-users.

The above proposals for amendments to the Functional Specifications were finally adopted on 17.01.2019.

2.6.3. Positions of the Commission on the protection of the interests of end-users

At its meeting held on 01.02.2018, the Commission adopted a position on the offering of discounts from the price of the subscription for electronic communications services. The position is available on the regulator's website www.crc.bg.[74]

At its meeting held on 15.02.2018, the Commission adopted a position on the content of the supplementary agreements for electronic communications services. The position is available on the regulator's website www.crc.bg.[75]

At its meeting held on 15.02.2018, the Commission adopted a position on the listing of the countries that belong to the various international groups in the individual contracts. The position is available on the regulator's website www.crc.bg.[76]

2.6.4. Cooperation with the Commission for Consumer Protection

There is a shared competence between CRC and CCP regarding some of the issues related to consumer protection in the area of electronic communications services.

Complaints related to distance contracts, unfair trade practices, removing unfair contract clauses, charging of unsolicited services, fall within the competence of CCP. In this respect and in implementation of the law, CRC has referred many consumers' issues to CCP.

Implementing the provision of Art. 37a of the LEC, CRC informed CCP of the launch of procedures for amendments of the General Requirements and Functional Specifications, giving it the opportunity to express an opinion on the provisions related to consumer protection.

CRC and CCP also cooperate in the framework of the work of the sectoral conciliation committees for the consideration of disputes in the field of electronic communications and postal services, established with the provision of Article 182, Para 4 of the Law on Consumer Protection.

2.7. Activities under the Law on Electronic Communications Networks and Physical Infrastructure

With the LECNPI, CRC was assigned with the role of a dispute resolution body with relation to the provision of access and/or shared use of physical infrastructure (Chapter 8 of the LECNPI), as well as a control body in respect of ensuring access to the physical infrastructure, including in-building one (Chapter 9 of the Law). The LECNPI provides for two dispute resolution procedures - giving of binding instructions (Art. 82-85 of the LECNPI) and assisting in the voluntary resolution of disputes (Art. 86 of the Law).

[74] https://crc.bg/files/_bg/Poziciq_2018.pdf
[75] https://crc.bg/files/_bg/Publikuvane_na_saita_poziciq_dop_sporazumeniq_19_2018.pdf
[76] https://crc.bg/files/_bg/Publikuvane_na_saita_poziciq_zoni_19_2018.pdf

In 2018, CRC was addressed for resolution of a dispute over the giving of binding instructions under Art. 82, Para 1 of the LECNPI with regard to the refusal of ELEKTRORAZPREDELENIE SEVER AD (ERP SEVER) to provide to TELNET OOD access to its physical infrastructure - low-voltage poles. As a result of the CRC's intervention, an agreement was reached between the parties - the initial refusal to provide access to 30 low-voltage poles was withdrawn, and access was granted to a total of 118 poles (Decision No 354/23.08.2018 of CRC).

In the past year, the Commission was addressed for a total of 24 disputes to render assistance (mediation) under Art. 86, Para 1 of the LECNPI. The subject of disputes were the general terms and conditions for the provision of access to and/or shared use of the physical infrastructure of CEZ[77], ERP SEVER[78] and ELEKTRORAZPREDELENIE YUG EAD (ERYUG)[79]. As a result of the assistance rendered by CRC, the three electricity distribution companies adopted a number of the complainants' requests and partially amended their general terms and conditions. The more essential amendments related to: publishing of the final general terms and conditions (ERYUG); publishing/decrease of the monthly prices for rent of pole network (CEZ - by 26% (from BGN 0.76 to BGN 0.56, VAT excl.), ERP SEVER - BGN 0.53, VAT excl., ERYUG - BGN 0.19, VAT excl.); publishing of pricing mechanisms as a minimum statutory requisite of the general terms and conditions; extending the time limits for the dismantling of electronic communications networks (ECNs); permitting the construction of ECNs not only on poles of the "terminal" and "angle", but also of the "bearing" type; increasing the maximum distance for direct construction of subscriber ECN diversions to buildings; removing the restrictions on the deployment of poles only on ECNs built using fibre optical technology and, respectively, on the deployment of ECNs made of copper cables and wires; the inclusion of texts concerning the maximum health and safety protection of citizens and of operators' employees; providing for clauses concerning the application of the access provision procedure under Art. 20 of the LECNPI in the previous period until the launch of the single information point; abolishing arbitration clauses and texts concerning payment of the right to pass through easement areas, etc.

In 2018, the Commission adopted and, respectively, drafted the following secondary regulations:

- Instruction No 1 of 31 January 2019 on the interaction of CRC with the State Energy and Water Regulatory Commission and with the Minister of Transport, Information Technology and Communications in the implementation of control for the provision of access under the LECNPI (Art. 88, Para 2 of the LECNPI, prom. SG no. 15 of 19.02.2019);
- Tariff of fees collected by the CRC pursuant to the LECNPI (Art. 81, Para 8 of the LECNPI, prom. SG no. 96 of 20.11.2018);
- List of independent consultants and external experts under Art. 87, Para 1 of the LECNPI (prom. SG no. 7 of 22.01.2019).

CRC participated actively in the preparation of the following draft secondary regulations:

[77] Requests from CABLE SAT-ZAPAD OOD, VITAL-E EOOD, MULTIMEDIA-BG EOOD, KRAKRA AD, TRANSCABLE TV OOD, OPTILAN EOOD, CABLE COM-HOLDING OOD and PERNIK LAN OOD;
[78] Requests from VIDEOSAT-NOVE OOD, NIKMIR OOD, CABLE TELEVISION DELTA OOD and NETWORX-BULGARIA EOOD;
[79] Requests from K&G UNISAT TV; DIANA CABLE TV OOD, VIRGINIA-RN EOOD, ELITCOM OOD, TRANSVIDEOCOM OOD, NIKO NET COM EOOD, DIGITAL CABLE CORPORATION OOD, BO CABLE OOD, VIVA-DOCHKA IVANOVA EOOD, ET ANGELSOFT-ANGEL GAROV, TRIMEDIA COMPUTER OOD, IN TRADE 87 EOOD, HRISINTA-72 EOOD, TERZIEV-2004 EOOD, LANSTAR OOD and ALPHA NET BG EOOD.

- Methodology for the manner of allocation of costs in determining the prices for the provision of access to and shared use of physical infrastructure and right of way under the Law on Electronic Communications Networks and Physical Infrastructure (Art. 3, Para 5 of the LECNPI, prom. SG no. 92 of 6.11.2018);
- Ordinance on the rules and regulations for the design, deployment and dismantling of electronic communications networks (Art. 63, Para 5 of the LECNPI).

IV. BUDGET

CRC budget implementation for 2018

The Communications Regulation Commission is a primary budget administrator.

By the Law on State Budget of the Republic of Bulgaria for 2018, the Ministry of Finance has determined for CRC:

- revenue in the amount of BGN 63,200 thousand;
- expenses in the amount of BGN 9,669 thousand.

In 2018, the revenue earned from fees, penalty orders and interest amounted to BGN 53,865 thousand which was 85% fulfilment of the annual plan.

Regardless of the reduction of fees collected in the 2.6 GHz band carried out by amending the Tariff of fees collected by CRC under the LEC and the conducted public consultations on the prospects of using the available resource in the 1.5 GHz, 2 GHz, 2.6 GHz and 3.6 GHz radio frequency bands, it was not used, which resulted in non-fulfilment of the annual task.

As a result of the issued acts for establishment of public state receivables and penalty orders sent for enforcement to the National Revenue Agency, a total of BGN 154 thousand were collected additionally in 2018.

The structure of the revenue part of the CRC budget for 2018 was as follows:

Table 19

Type of revenue	**Value (BGN '000)**	**Share (%)**
1. Own revenue approved with the CRC budget for 2018	**63,200**	
2. Revenue generated for 2018, incl.:	**53,865**	**100.00**
- one-off fees under the Law on Electronic Communications	1,136	2.11
- one-off fees under the Postal Services Act	20	0.04
- administrative annual charge - control	4,500	8.35
- charges for the use of an individually assigned scarce resource - radio frequency spectrum	37,317	69.28
- fees for the use of an individually assigned scarce resource - positions on a geostationary orbit assigned for the Republic of Bulgaria according to international agreements	228	0.42
- charges for the use of individually assigned scarce resource following tender calls	2,375	4.41

- charges for the use of an individually assigned scarce resource - numbers from the National Numbering Plan (NNP);	7,197	13.36
- fines and property sanctions	956	1.78
- interest	136	0.25

Distribution of revenue receipts and costs incurred in 2018

The revenue received at CRC in 2018 was allocated pursuant to Art. 148 of the LEC and Art. 64 of the PSA in revenue to the state budget (SB), Ministry of Transport, Information Technology and Communications (MTITC), and the CRC budget, as follows:

Table 20

	ALLOCATION LINES	DEDUCTIONS ON ITEMS (BGN '000)	SHARE (%)
	TOTAL REVENUE ASSIGNED TO THE STATE BUDGET, INCL. FROM:	**12,109**	**22.48**
	Annual charges for the use of an individually assigned scarce resource - radio frequency spectrum	9,329	77.04
	Annual charges for the use of an individually assigned scarce resource - positions on a geostationary orbit assigned for the Republic of Bulgaria according to international agreements	160	1.32
	One-off fees for additional use and renewal of authorisation to use	188	1.55
	Charges for the use of individually assigned scarce resource following tender calls	1,663	13.74
	Fines and property sanctions	765	6.32
	One-off fees under the PSA	4	0.03
.	**TOTAL REVENUE ASSIGNED TO THE MTITC, INCL.:**	**13,787**	**25.60**
	Annual charges for the use of an individually assigned scarce resource - radio frequency spectrum	13,061	94.73
	Annual fees for the use of an individually assigned scarce resource - positions on a geostationary orbit assigned for the Republic of Bulgaria according to international agreements	57	0.41

	One-off fees for additional use and renewal of authorisation to use	67	0.49
	Charges for the use of individually assigned scarce resource following tender calls	593	4.30
	One-off fees under the PSA	9	0.07
	TOTAL REVENUE ASSIGNED TO THE CRC BUDGET, INCL.:	**27,969**	**51.92**
	One-off administrative fees for issuance of authorisations and for administrative services	867	3.10
	One-off fees for additional use and renewal of authorisation to use	14	0.05
	Administrative annual charge - control	4,500	16.09
	Annual charges for the use of individually assigned scarce resource - radio frequency spectrum	14,927	53.37
	Annual fees for the use of individually assigned scarce resource - positions on a geostationary orbit assigned for the Republic of Bulgaria according to international agreements	11	0.04
	Charges for the use of individually assigned scarce resource following tender calls	119	0.43
	Annual charges for the use of individually assigned scarce resource - NNP numbers	7,197	25.73
	Fines and property sanctions	191	0.68
	Interest	136	0.49
	One-off fees under the PSA	7	0.02
	TOTAL DEDUCTIONS TO ALLOCATION LINES	**53,865**	**100.00**

The Communication’s budget funds were spent on financing its activities (including projects related to market regulation and liberalisation), for participation in the work of the Body of European Regulations for Electronic Communications and to ensure effective and efficient control.

The structure of expenses for 2018 was as follows:

Table 21

Type of expenses	**Value (BGN '000)**	**Share (%)**
1. Salaries	4,602	49.95
2. Social security contributions	1,214	13.18
3. Other remunerations and payments	214	2.32
4. Operative costs	1,638	17.77
5. Membership fee	68	0.74
6. Capital expenditure	1,478	16.04
Total costs	**9,214**	**100.00**

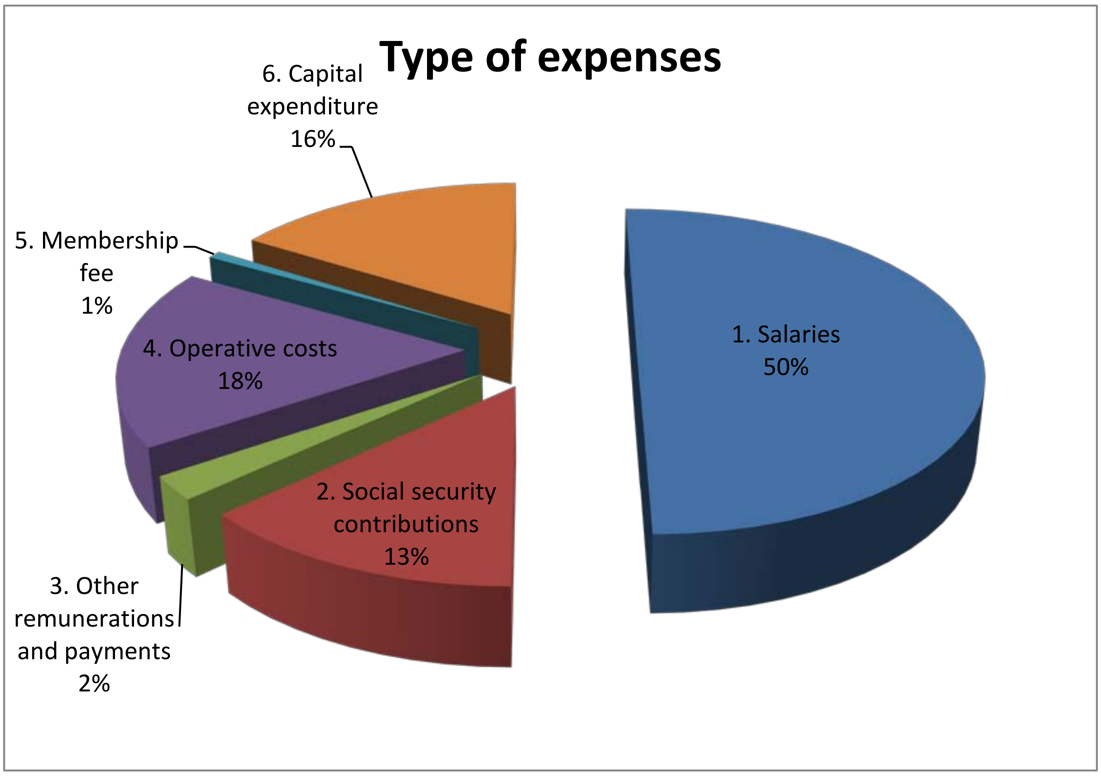


Figure 52

In 2018, the budgetary funds spending was carried out in strict compliance with the financial discipline and the principles of legality, appropriateness, effectiveness and efficiency. Projects assigned to CRC by legislative acts were implemented of priority.

The good investment policy of CRC enabled the completion of the project for updating the applied radio monitoring service, which increased the efficiency of the radio frequency spectrum monitoring. A monitoring device was purchased for the National Radio Frequency Spectrum Monitoring System with relation to the improved functionalities of the specialised applied software for radio monitoring. In addition, a project was funded for introduction of electronic questionnaires to be completed on-line by undertakings providing electronic communication services and/or networks, and by postal services operators. The project was aimed at reducing the administrative burden on undertakings obliged to submit information to CRC, on an annual basis, on their activity related to the provision of electronic communication services and/or such that perform electronic communication activities, as submission of electronic questionnaires is scheduled to start in 2020.

CONCLUSION

The development of technologies, the emergence of new services and the transition to the information society are indicative of the changes in the market of electronic communications networks and services. New types of market players, market structures and business models emerge. At the same time, there is a trend toward consolidation of the relevant market players and strengthening of the horizontal impact exerted on them by markets in other sectors as a result of the increased joint offering of electronic communications services, content services and information society services.

The new Electronic Communications Code created conditions for a harmonised European regulation of the related digital single market. The consistent application of updated regulatory rules will ensure a level playing field for all market players, including for the OTT service providers. The amendments are also aimed at creating a coherent approach in respect of implementation of the policy in the field of radio frequency spectrum and its management. The essential changes in the regulatory framework have caused serious challenges for the work of CRC.

Undoubtedly, the future period is very important for the electronic communications sector and for the regulator. The introduction of the Code to the national legislation should be carried out within the short period of 2 years. This requires an active joint, coordinated work both of the institutions connected with the process - the Ministry of Transport, Information Technology and Communications, the Communications Regulation Commission, the National Assembly - and of the business and consumer organisations. Last but not least, one of the challenges faced in the work on this strategic direction is to settle the terms of cooperation and coordination of the activities of CRC with other competent bodies which will be assigned with the task to implement the Code, as is required by its provisions.

The creation of conditions for competition promotion is not sufficient to achieve stability of the market. Taking into account the diversity of conditions, CRC focuses on markets in which competition is not yet effective and which are of key importance for Europe's competitiveness. In this connection, one of the objectives of the Commission's work in the following year is to complete the fourth round of analyses of the market for call termination on fixed and mobile networks.

The reliable interaction by electronic means between citizens, undertakings and public authorities will increase the efficiency of public and private on-line services, electronic business and electronic commerce. In 2019, CRC will continue to ensure reliable and secure trust services in order to expand their use in the various spheres of public life.

The protection of the interests of end-users through the application of sectoral rules, ensuring connectivity and electronic communications services, giving rise to the maximum user benefit to choose, in terms of price and quality, and taking into account the specific needs of the customers with disabilities and with special social needs - these are only part of the many tasks facing the Communications Regulation Commission.

The upcoming years will be a period of extremely dynamic technological, market and regulatory changes which require intensive work not only for the achievement of the set objectives, but also in respect of revising and implementing the methods and tools of the regulatory intervention itself with a view to facilitating and ensuring its sustainability, effectiveness and efficiency. In this sense, the active cooperation with the other regulatory bodies of the EU member states and CRC’s engagement in the activities of the European bodies and agencies working in these sectors with a view to completing the digital single market, part of which is Bulgaria as well, is of particular importance to CRC.