UKE | Office of Electronic Communications

Report on the state of the telecommunications market in Poland in 2017

Warsaw, June 2018

Contents

Introduction

We are handing over the report on the state of the telecommunications market in 2017. It consists of two parts. The first concerns the market itself, the second concerns the telecommunications infrastructure. Both parts of the Report have been prepared on the basis of data collected from telecommunications undertakings as of December 31, 2017.

"2017 was full of events important for the telecommunications market, including the consolidation of Netia with the Cyfrowy Polsat group, the P4 stock exchange debut, or the entry of an infrastructure fund that took control over INEA into the Polish market. Both operators and the President of the Office of Electronic Communications as well as the legislators themselves had to face the challenges resulting from the roaming regulation and its negative impact on revenues of mobile operators. As the Chamber, we believe that the law needs changes that would allow operators to implement surcharges approved by the decision of the President of the Office of Electronic Communications in a simpler and quicker manner."
Eugeniusz Gaca, KIGEiT

In 2017, the value of the telecommunications market amounted to, as in 2016, approx. PLN 39.5 billion. Approx. 14.5 million people used the internet. The level of penetration with broadband internet services decreased slightly, however the decrease is related to the change in the statistical number of households, and not with decreasing popularity of the services. The trend of the past few years according to which the value of this market segment decreased slightly has been maintained and the value amounted to PLN 4.7 billion. As in 2016, cellular modems were the most popular technology for accessing the network.

"It is also worth noting that there is the first wholesale-only operator – Nexer – on the market. I will follow the results of their activities with interest. The spectacular entry of Play onto the Warsaw Stock Exchange is also worth noting. The end of 2017 brought another large-calibre news, the takeover of Netia by Cyfrowy Polsat, which will not be without consequences for the market and further convergence of telecommunications services."
Stefan Kamiński, KIGEiT

10.15 million people used bundled services in 2017. The services are becoming more and more important – the number of users has increased by 29% during a year. As in 2016, "Mobile telephony + mobile internet" was the most popular bundle. The bundle was used by over 60% of people using bundled services.

In the mobile telephony segment, the trend of reducing the total number of SIM cards has been maintained. In 2017, there were 53.3 million of them (2.2 million less than in 2016), and market penetration was 138.6% (5.6 pp less than in 2016). Last year, the segment saw the lowest revenues (PLN 15 billion) in recent years and the highest dynamics of the decrease (-10.5% compared to 2016). The key event on the market was the introduction of the "Roam Like At Home" principle. The principle means the use of an identical roaming charging mechanism as domestically.

"Summing up 2017, I would start from February 1, the date of the mandatory registration of pre-paid cards. The Armageddon was not there, but the clearing of the so-called "dead souls" contributed to the change in the position of the leader in terms of active SIM cards. Another event that evokes the most emotions, in my opinion the key one, is the introduction of the Roam Like at Home mechanism, which, as it turned out, was associated with reasonable operator concerns. According to the EY analysis, the market was to lose PLN 800m-1bn annually and it seems that the telecommunications market could actually face this level of losses."
Stefan Kamiński, KIGEiT

In 2017, the significance of the fixed-line telephony segment continued to decline. As in previous years, its value decreased and reached PLN 2.3 billion (PLN 2.6 billion in 2016). The number of subscribers also decreased, down to 4.8 million (from 5.2 million in 2016).

"2017 was a year of dynamic changes, strategic partnerships and ground-breaking transactions. We observed further market convergence in the increased competition of the dominant mobile operators entering the fixed-line market. This was accompanied by consolidation movements that will determine the future direction of the industry's development. The take-over of the fixed-line operator Netia by the mobile Cyfrowy Polsat group opens the possibility of further cross-sector cooperation. It also confirms the need for further consolidation of the cable industry."
Jerzy Straszewski, PIKE

The number of the users of VoIP telephony provided as part of the operator's own network in 2017 increased, compared to the previous year, by 18% and amounted to 1.23 million. The number of users using the service in the network of another operator decreased in this period by approx. 19% and amounted to 0.33 million.

The second part of the Report presents information about domestic infrastructure and network coverage enabling broadband access to the internet.

In connection with the amendment of the Act on supporting the development of telecommunications services and networks setting out a catalogue of information that may not be treated as company secrets (Article 29 (6b)), most of the data transferred during the inventory is public, therefore, as in the previous year, detailed data is not attached to the report but is available as an API on the Central Public Information Repository[1] and in the form of a search engine on the website[2].

[1] https://danepubliczne.gov.pl/dataset/system-informacyjny-o-infrastrukturze-szerokopasmowej-api

[2] https://wyszukiwarka.uke.gov.pl

One of the indicators for the development of the telecommunications infrastructure is the increase in the number of own telecommunications network nodes installed, the number of which increased by over 30,000 in 2017 compared to 2016.

The effect of the telecommunications market development and the effectiveness of the investments supported from public funds is a systematic decrease in the number of towns where there are no access nodes installed. The effect is recorded as a four percent increase in the share of access nodes located in rural areas in relation to the data for 2016.

"The key event of the past year is the culmination of the OPDP programme in axis I, which turned Poland into a huge construction site for modern telecommunications infrastructure. The construction and coverage of the territory of Poland with NGA networks is a prerequisite and a key condition for the process of the digitization of the country and the acceleration of Poland's economic development. The Operational Programme Digital Poland is also an investment in the future and education, due to the provision of modern networks for all educational institutions in the country and the creation of the National Education Network to provide modern services for such institutions. We hope that the excellent absorption of funds under axis I will translate into an increase in the pool allocated for the construction of NGA networks, thanks to which the EAC and Gigabit Society's goals will be accomplished in such a difficult investment area as Poland."
Eugeniusz Gaca, KIGEiT

Nowadays, the development of telecommunications networks is mainly achieved by increasing the share of the optical fibre length in the total length of telecommunications lines. In 2017, the share of this technology was over 95%. Compared to the previous inventory for 2016, there are approx. 34,000 fibre optic nodes more in Poland, which means an increase of 22%.

"In the new market environment, the cable industry sees the need for extended cooperation with the Regulator and state administration, which will make it possible to work out optimal conditions for further development of the sector, supporting investments and building the scale necessary to drive innovation in the era of increasing global competition and the quickly changing customer needs."
Jerzy Straszewski, PIKE

The possibility of accessing fixed-line internet with the minimum speed of 30 Mb/s is currently provided in approx. 33% of buildings. Access to the services of the highest speeds (at least 100 Mb/s) is currently provided for every tenth residential building in Poland; in 2016, it was every twelfth building.

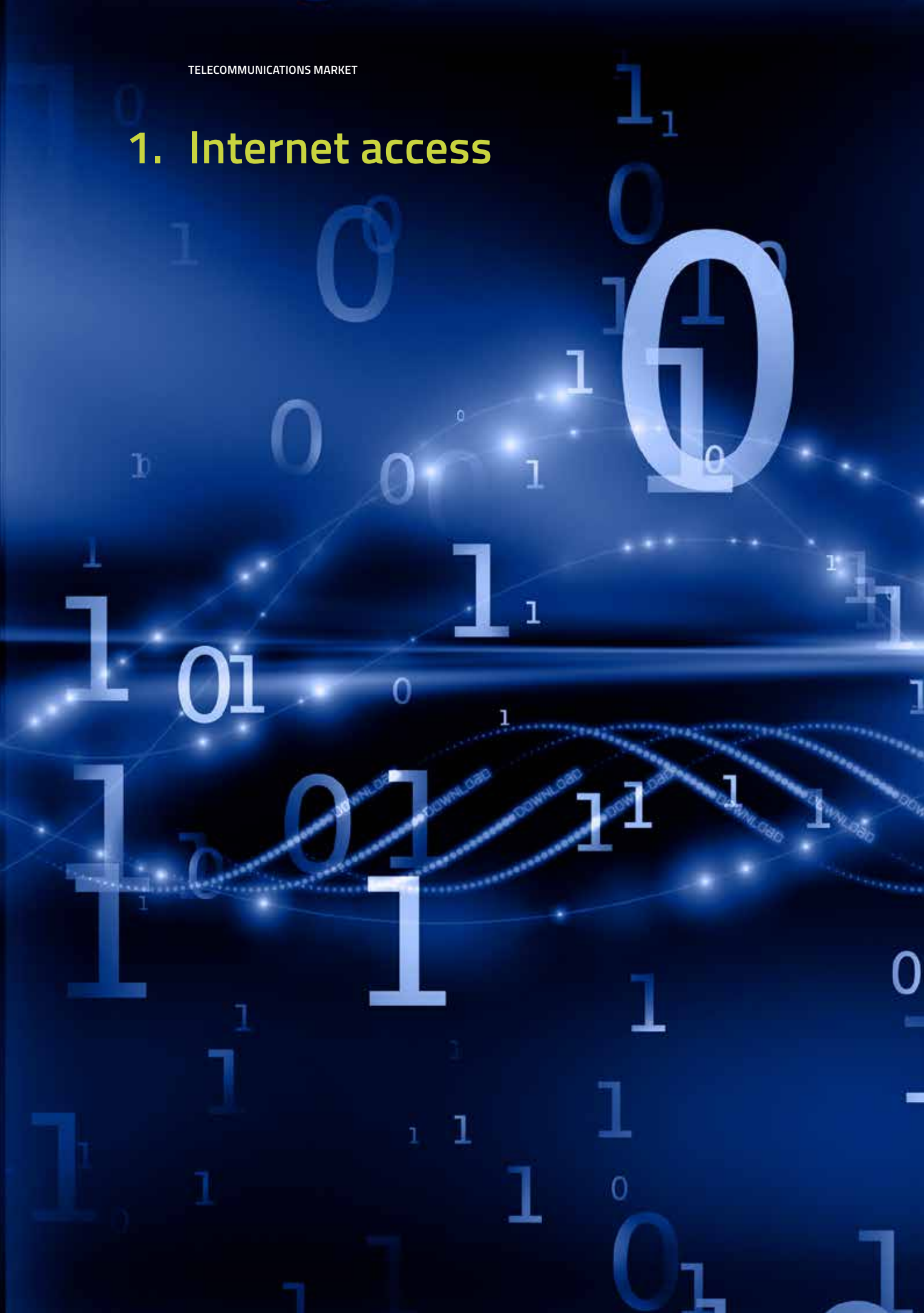
The offer of fixed-line internet is complemented by the LTE technology mobile internet whose share increased by approx. 2 pp compared to 2016 and amounted to over 84% in 2017.

In comparison to the previous year, the number of localities where no operator declared coverage of fixed-line and radio networks decreased by 8%, with 99% of them being the smallest localities with several buildings, often in sparsely populated areas.

The multiplicity and diversity of entities operating on the telecommunications market significantly reduces the amount of "white spots" on the map of internet availability in Poland.

"From the perspective of the development of broadband infrastructure, the result and the course of the second competition within measure 1.1. of OPDP were very important in 2017. Numerous small and medium enterprises took part in the call, often winning the co-financing competition with large players. This confirms the long-standing thesis of KIKE that SMEs, due to the excellent knowledge of the local market, are the best implementers of public policy in the field of levelling the differences in access to the digital market. The new strategy of the President of the Office of Electronic Communications has certainly positively influenced the more effective use of the existing passive infrastructure and the introduction of new financial instruments at the end of the year, such as a broadband loan, stimulated investments in the industry."
Karol Skupień, KIKE

1. Internet access

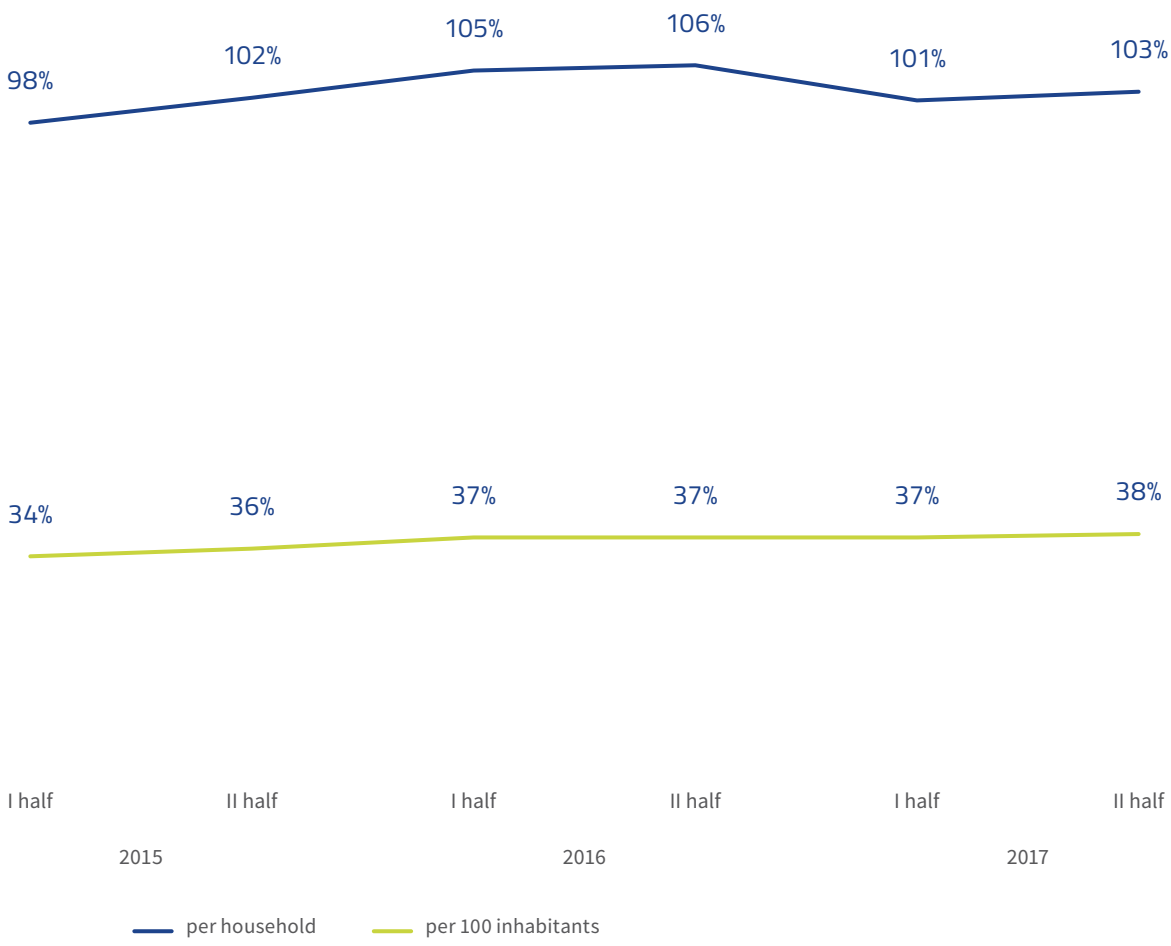


1.1. General information

Penetration with broadband (fixed-line and mobile) services in Poland at the end of 2017 was at the level of 103% per household. This is an increase, by 2 p.p. compared to the first half of 2017. Penetration in relation to residents amounted to 38% in 2017.

Chart 1

Broadband services penetration rate[3]



Source: UKE

[3] In 2017, the basis for calculating the rate was changed. Until 2016, the basis for calculating penetration was the number of households amounting to 13.5 million. In 2017, GUS forecasts from 2016 were used to determine the rate. On such basis, the number of households was determined at the level of approximately of 14.1 million. The change had an impact on the lower value of the penetration rate in 2017.

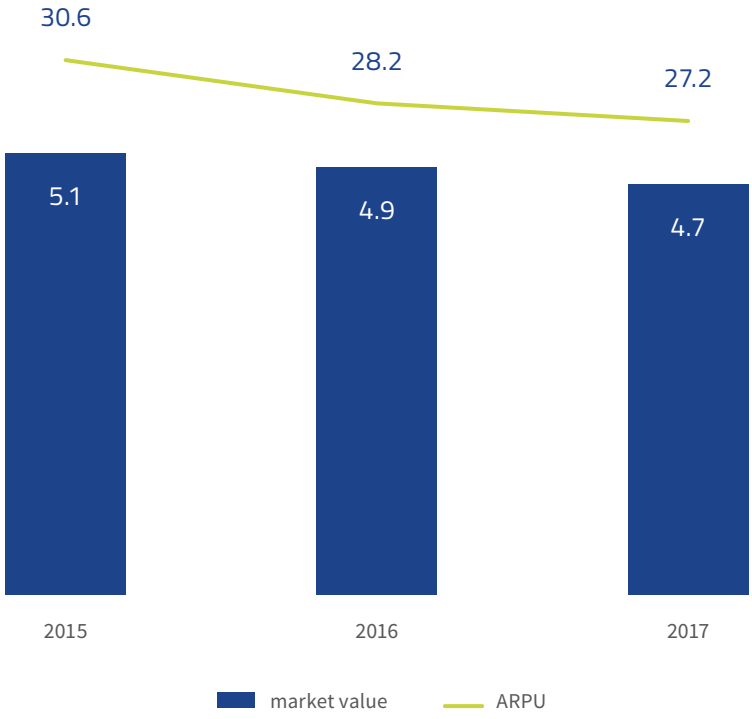
1.2. Revenues

The value of the internet access services market in 2017 was at the level of PLN 4.7 billion. It recorded a decrease by approx. PLN 0.2 billion compared to 2016. The average monthly revenue per subscriber also decreased with revenues. In 2016, it amounted to PLN 28.2, one year later it was lower by PLN 1 and reached PLN 27.2.

The revenue structure in 2017 was very similar to the one in 2016. Operators still recorded greatest revenues from internet access using dedicated mobile devices (approx. 35% of revenues). The second position was taken by the xDSL technology (22%) and the third by the cable TV modem (20%).

Chart 2

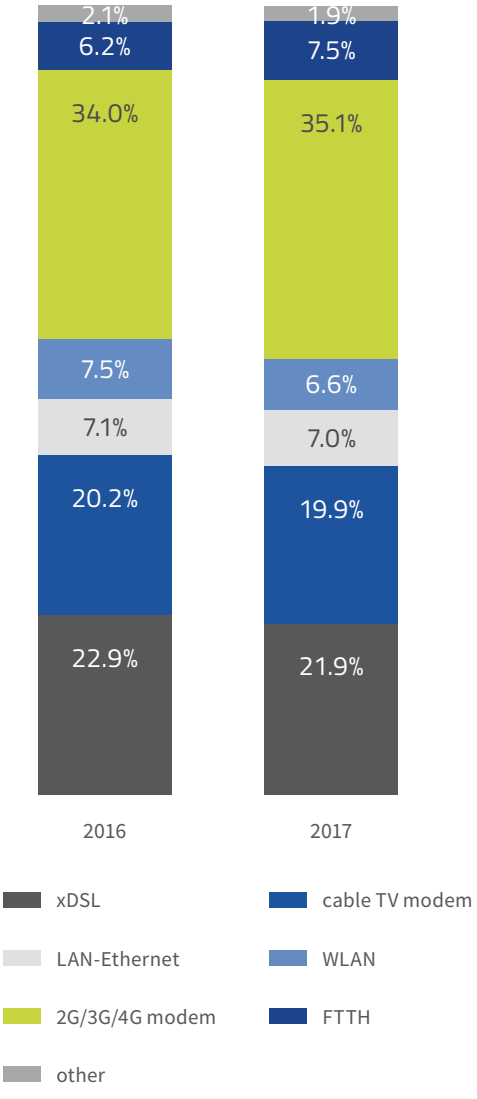
Value of the internet access market (PLN billion) and average monthly revenue per user (ARPU in PLN)



Source: UKE

Chart 3

Revenue structure in terms of technology used



Source: UKE

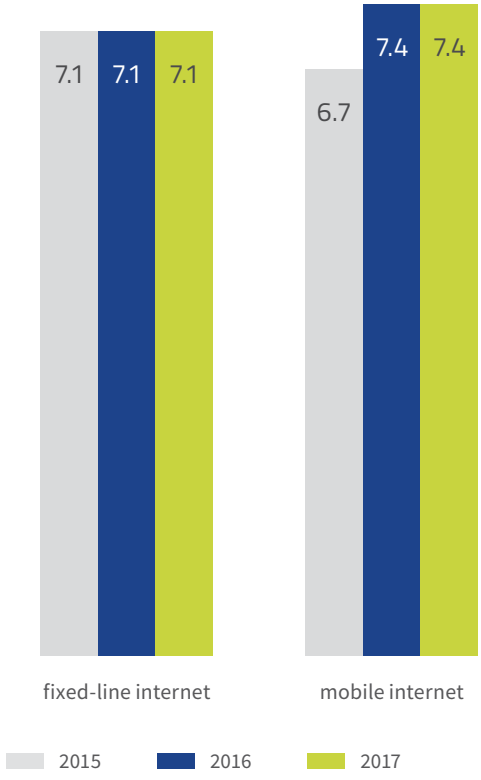
1.3. Subscribers

The number of subscribers to the network access service remained at a similar level compared to 2016. In 2017, there were approximately 7.1 million users of fixed-line internet. 7.4 million people used mobile access. In total, 14.5 million users had the internet service.

Over 51% of all subscribers used access via dedicated mobile devices, such as modems, cards, keys. CATV (19%) and xDSL (16%) were also popular technologies.

Chart 4

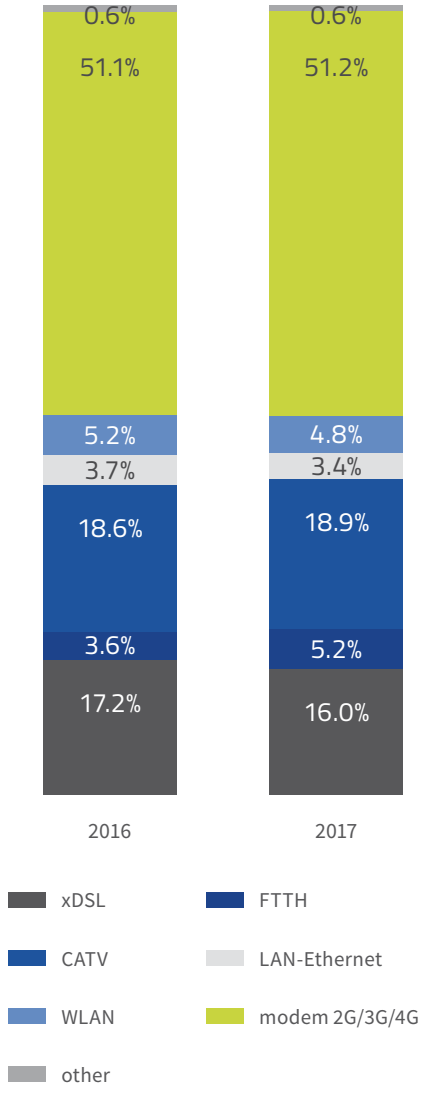
Number of fixed-line and mobile subscribers (million)



Source: UKE

Chart 5

Structure of subscribers in terms of access technology used



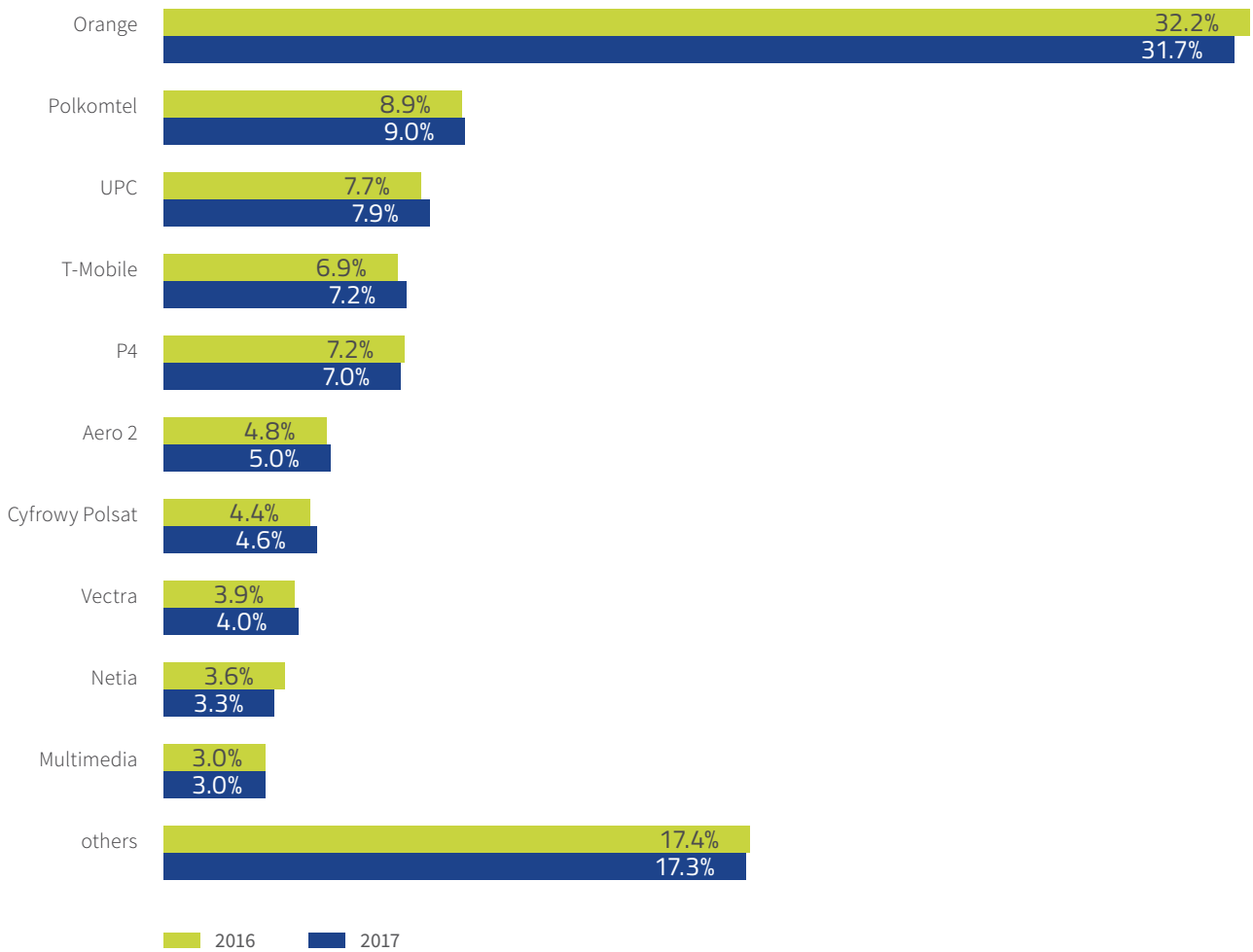
Source: UKE

1.4. Market structure

The largest share in the internet access (fixed-line and mobile) market in terms of the number of users in 2017 was held by Orange. In total, it had nearly 32% of all internet users in Poland in its customer base.Polkomtel took the second position, with a share of 9%. The third place was taken by UPC with the result of 8%.

Chart 6

Operators' shares in terms of the number of internet users



Source: UKE

1.5. Internet access technologies

Mobile modems

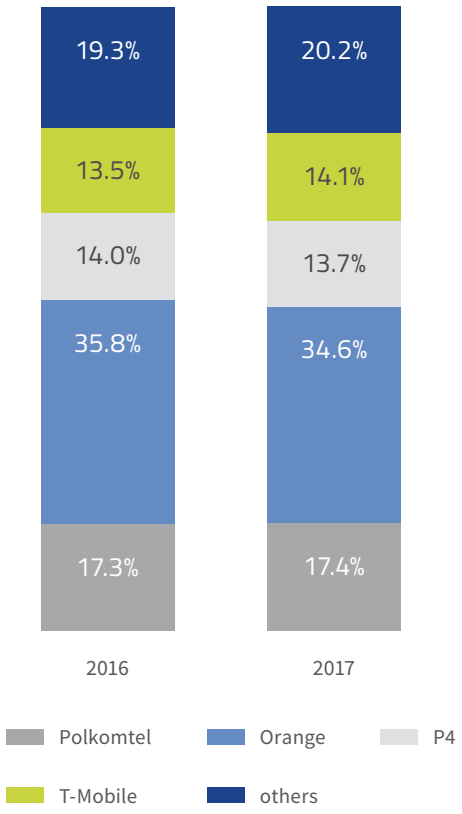
In 2017, revenues obtained from the provision of the mobile network access service amounted to PLN 1.7 billion. Orange held the biggest share in the number of users in this market segment (35%). The second most popular undertaking, Polkomtel, had 17% of all users with access to mobile internet. T-Mobile took the third position, with a result of 14.1%.

CATV modem

The largest share in the market for internet access via cable modems in 2017 was held by UPC. In total, more than 41% of the users had the service provided by that undertaking. Vectra, which took the second position in terms of the number of customers, held approx. half of the shares of UPC. They amounted to 21% in 2017. The value of the internet access market via cable modems was PLN 0.9 billion.

Chart 7

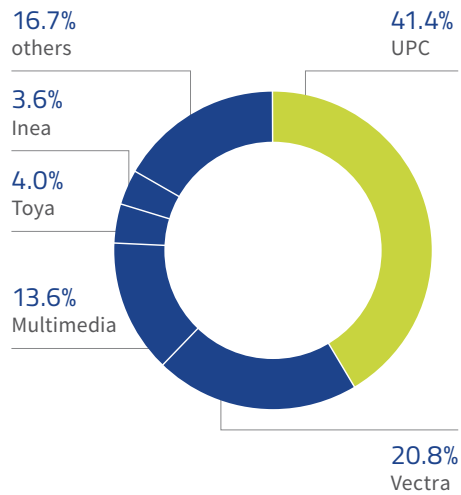
Operators' shares in the total number of users using modems



Source: UKE

Chart 8

Operators' shares in the total number of users using the internet access service via the CATV modem



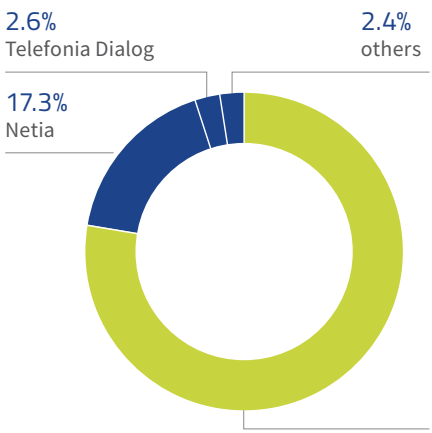
Source: UKE

xDSL

In 2017, undertakings providing services based on xDSL achieved revenues of PLN 1 billion. Orange had by far the largest share in the market in terms of the number of customers. Nearly 78% of all the users of xDSL technology used the services of this undertaking.

Chart 9

Operators' shares in the total number of users using xDSL-based internet access services



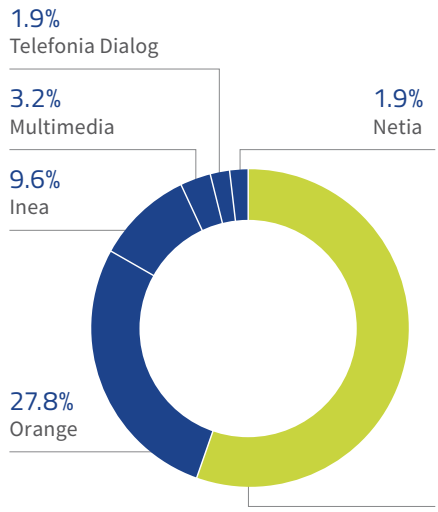
Source: UKE

FTTH

The FTTH market grows dynamically year by year. In comparison to 2016, this service was used in 2017 by 200,000 people more. This market segment is very fragmented. In 2017, Orange had the largest share in the number of users (28%). Inea (9.6%) ranked second in terms of popularity. Revenues from this market were at the level of nearly PLN 0.4 billion.

Chart 10

Operators' shares in the number of users using FTTH-based internet access services



Source: UKE

WLAN and LAN-Ethernet

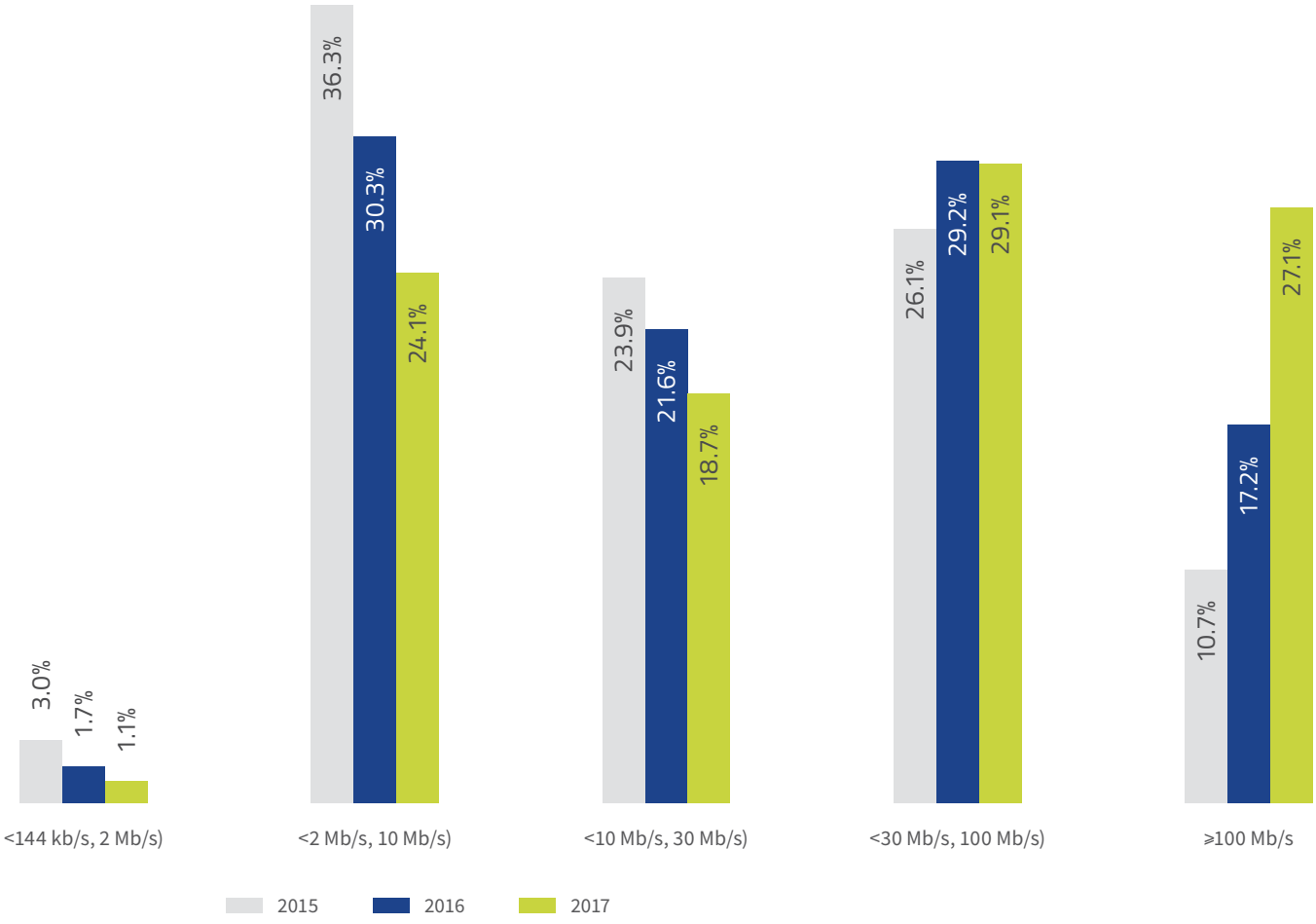
Small undertakings dominate the WLAN and LAN-Ethernet market. In both cases, more than 85% of all the operators providing services via the technologies had less than 1,000 customers. In total, the services generated revenues at the level of PLN 0.6 billion. Approx. 1.2 million people used these technologies in 2017.

1.6. Capacity

The share of low speed lines, under 30 Mb/s, tends to decrease year by year. The greatest decrease was visible in the case of speeds below 2 Mb/s (by 37 % less) and from 2 Mb/s to 10 Mb/s (by 21% less). The increase in the share of lines of more than 100 Mb/s is by far the most dynamic. Compared to 2016, the share of such lines in 2017 was higher by 10 p.p. and amounted to 27.1%.

Chart 11

Shares of lines by speed



Source: UKE

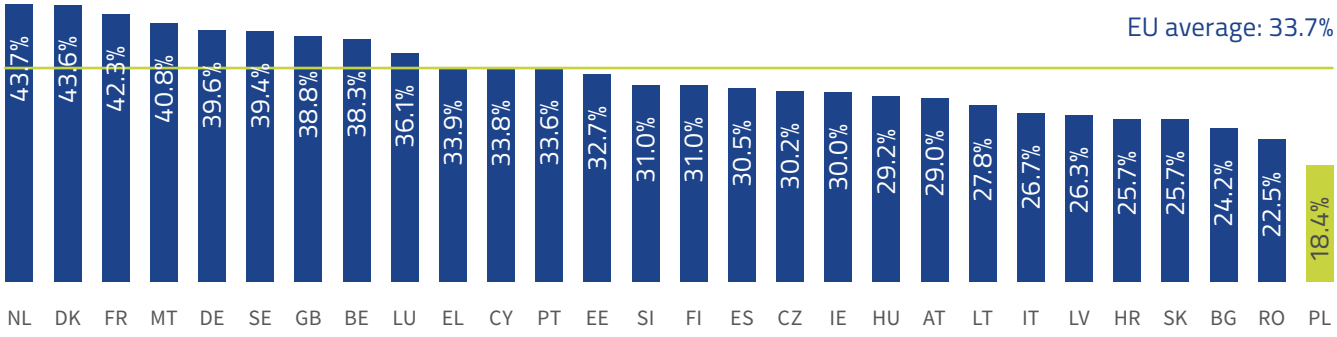
1.7. Comparison with European Union countries

The highest penetration of fixed-line internet services was visible in 2017 in the Netherlands. Approx. 44% of all the inhabitants of that country had access to the network at a fixed location. The European average for the services was 34%. In Poland, the penetration of fixed-line internet was at the level of over 18% and was the lowest among all EU countries.

Poland remains one of the leaders of the mobile market in Europe. The penetration of mobile internet services in our country was at the level of 144%, or approx. 54 pp. more than the European average. This result makes Poland rank second in Europe. The first position in terms of penetration in 2017 was taken by Finland with a penetration rate of 146%.

Chart 12

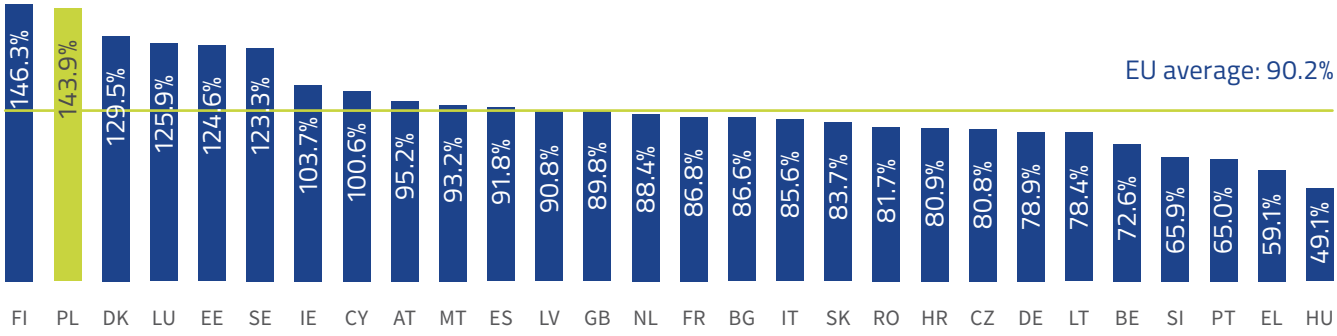
Penetration of fixed-line broadband in the EU



Source: Digital Agenda Scoreboard, June 2017

Chart 13

Penetration of mobile internet services in the EU



Source: Digital Agenda Scoreboard, June 2017

1.8. Prices of fixed-line internet access services

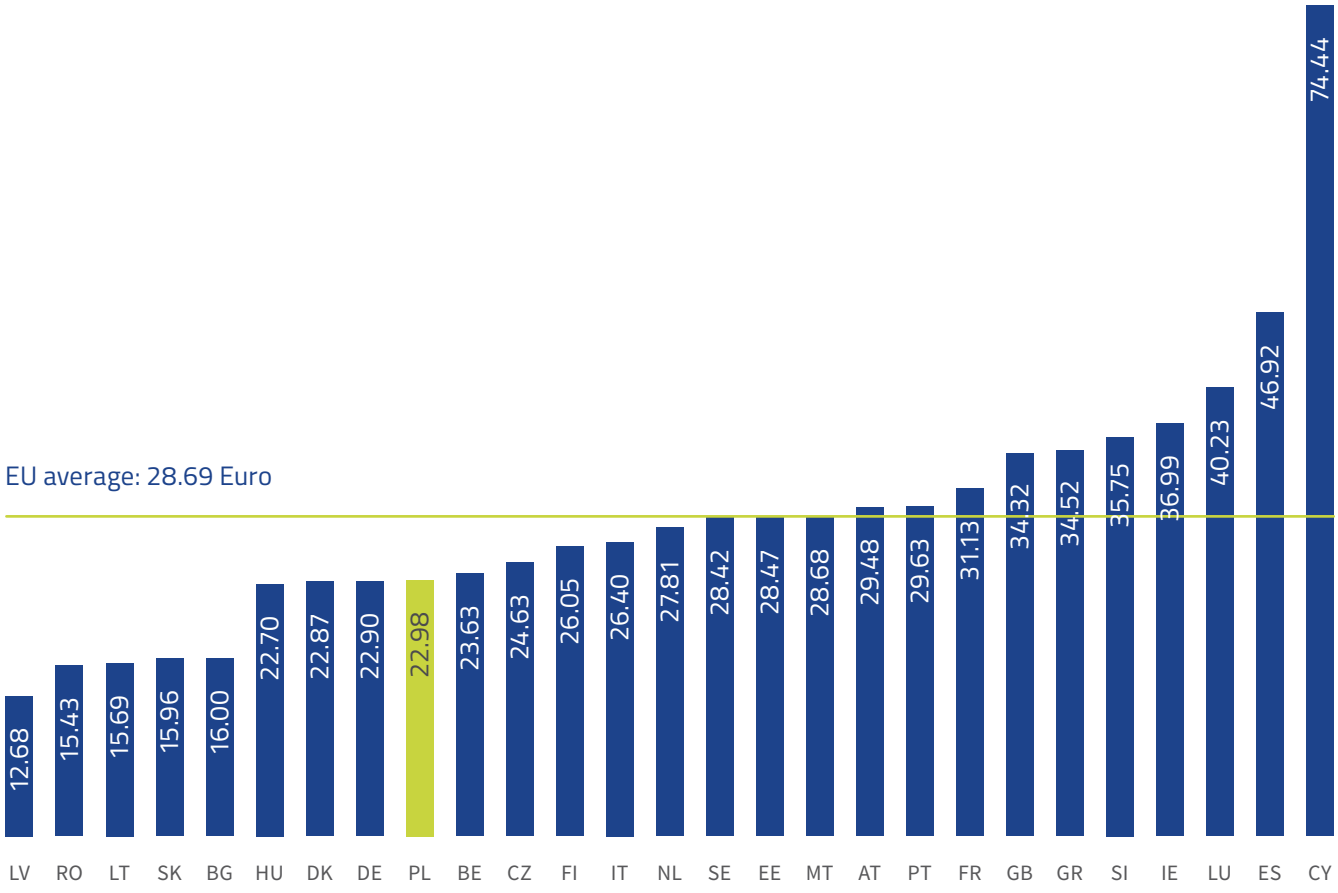
Price benchmarks in the European market were made using the Fixed Price Broadband[4] database. The OECD Medium 4 basket: 50H / 50GB was selected for analysis. Two speed ranges, from 30 Mb/s to 100 Mb/s and more than 100 Mb/s were selected for the price benchmark. Only the cheapest offers were considered in each of the ranges.

In the case of the range from 30 Mb/s to 100 Mb/s, the highest rates were offered in Cyprus. People in this country paid for a fixed-line network access service with this capacity approx. EUR 74.44. The European average was EUR 28.69. Prices in Poland were at the level of EUR 22.98.

[4] The database is developed by the analytic company *Strategy Analytics*

Chart 14

Average monthly service cost in the EU for the speed range from 30 Mbit/s to 100 Mbit/s (EUR, including VAT)



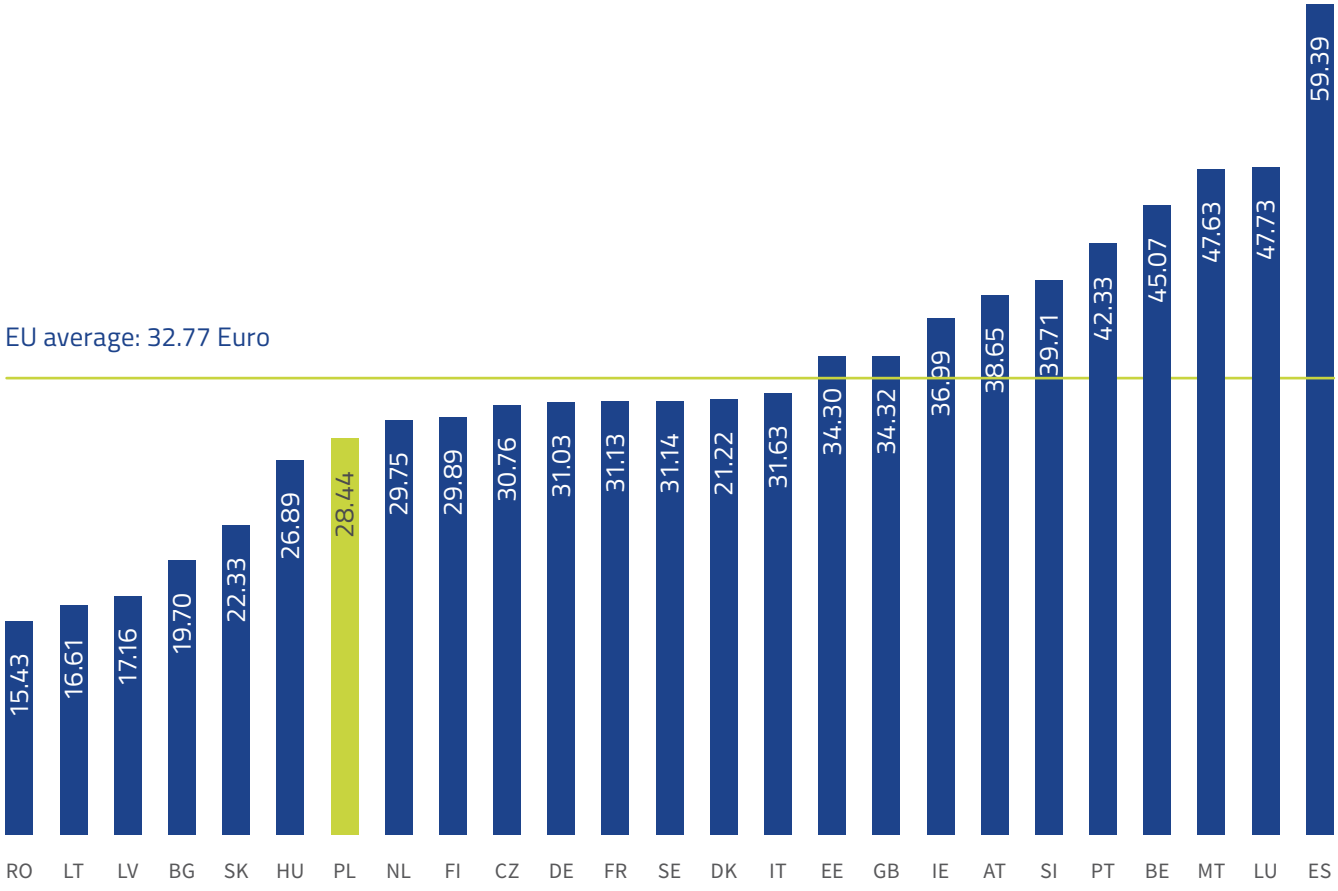
Source: UKE, based on Fixed Broadband Price Benchmarking, Strategy Analytics

Note: tariffs for individual and business customers buying only the internet access service were included (bundles were excluded from the analysis). For Poland, the UPC offer was selected, the Start 60 Package (24M). The cost of the service as of June 2017.

The cheapest services in the range of more than 100 Mb/s were available in Romania. The inhabitants of this country paid EUR 15.43 for fixed-line internet with this speed. Fees in Poland for this service were at the level of EUR 28.44. The rate was lower than the European average which amounted to EUR 32.77.

Chart 15

Average monthly service cost in the EU for the speed range of more than 100 Mbit/s (EUR, including VAT)



Source: UKE, based on Fixed Broadband Price Benchmarking, Strategy Analytics

Note: tariffs for individual and business customers buying only the internet access service were included (bundles were excluded from the analysis). For Poland, the UPC offer Fibre Power 120Mb/s 24M, was selected. The cost of the service as of June 2017.

2. Mobile telephony

2.1. Market characteristics

31 undertakings operated on the domestic mobile telephony market at the end of 2017, 2 more than in the previous year. Five of them had their own infrastructure (MNO operators), and 26 used the network of the selected technology partner (MVNO operators).

Table 1

Operators reporting to UKE as of 31 December 2017

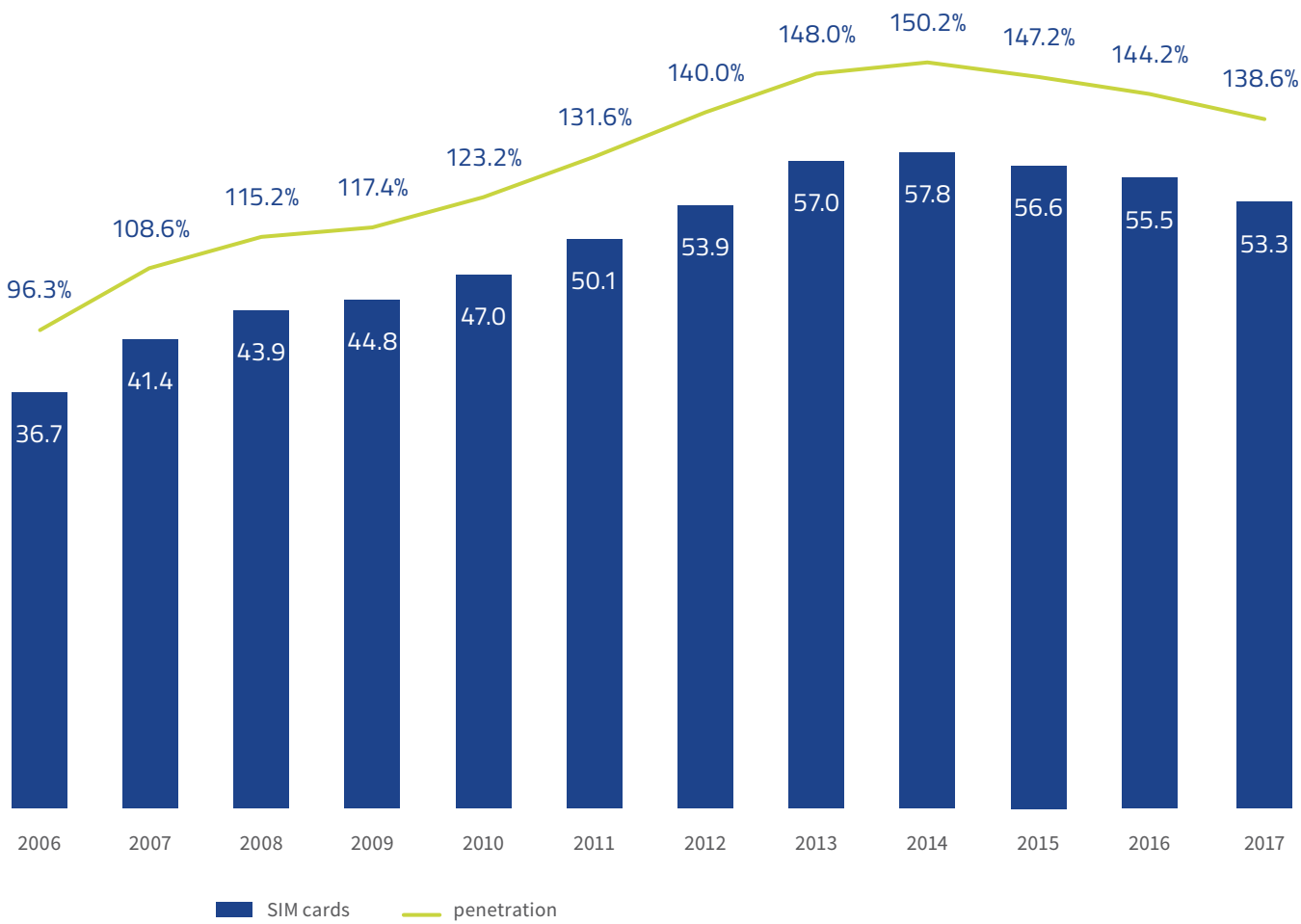
No.	Operator	MNO	MVNO
1	Orange Polska S.A.	MNO	
2	Polkomtel Sp. z o.o.	MNO	
3	T-Mobile Polska S.A.	MNO	
4	Netia S.A.		MVNO
5	Sferia S.A.		MVNO
6	Telefonia Dialog Sp. z o.o.		MVNO
7	Multimedia Polska – Południe S.A.		MVNO
8	Cyfrowy Polsat S.A.		MVNO
9	P4 Sp. z o.o.	MNO	
10	UPC Polska Sp. z o.o.		MVNO
11	TOYA Sp. z o.o.		MVNO
12	Gawex Media Sp. z o.o.		MVNO
13	INEA S.A.		MVNO
14	Telewizja Kablowa Chopin Sp. z o.o.		MVNO
15	Internetia Sp. z o.o.		MVNO
16	Telestrada S.A.		MVNO
17	Vectra S.A.		MVNO
18	ITI Neovision S.A.		MVNO
19	FM Group Mobile Sp. z o.o.		MVNO
20	Voice Net Sp. z o.o.		MVNO
21	Aero 2 Sp. z o.o.	MNO	
22	Sat-Film Sp. z o.o. i Wspólnicy S.K.		MVNO
23	Metroport Sp. z o.o.		MVNO
24	Novum S.A.		MVNO
25	Lycamobile Sp. z o.o.		MVNO
26	Truphone Poland Sp. z o.o.		MVNO
27	Ahmes Sp. z o.o.		MVNO
28	Virgin Mobile Polska Sp. z o.o.		MVNO
29	Klucz Telekomunikacja Sp. z o.o.		MVNO
30	Vikingco Poland Sp. z o.o.		MVNO
31	Premium Mobile SA		MVNO

Source: UKE, based on operators' data

The number of mobile telephony users has steadily declined for several years. At the end of 2017, the number of active SIM cards totalled 53.3 million, which meant a 4% decrease compared to 2016. Thus, the penetration of mobile telephony services was lower and amounted to less than 139% compared to 144% in the previous year. At the same time, operators recorded an increase of 14%, to the level of 2.8 million cards intended for M2M communication. These cards accounted for 5.3% of all SIM cards compared to 4.4% in 2016.

Chart 16

Number of users (SIM cards in millions) and mobile penetration in Poland



Source: UKE, based on operators' data

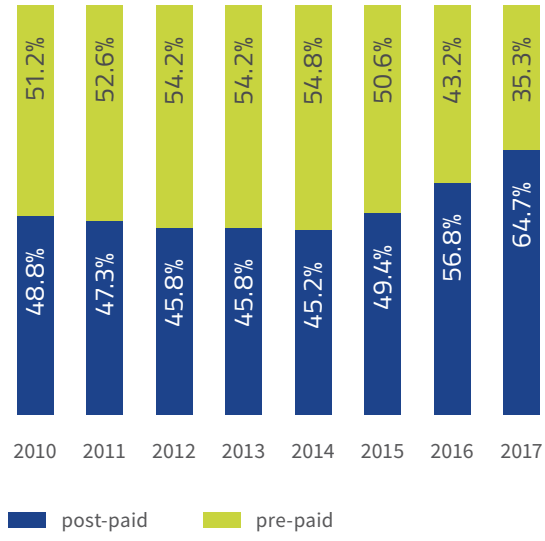
The introduction of an obligation to register pre-paid cards caused a significant drop in the number of pre-paid users in favour of subscribers. At the end of 2017, the number of pre-paid SIM cards decreased by 22.3% to 17.8 million, compared to 2016. Post-paid users accounted for almost 65% of all mobile telephony users.

According to Analysys Mason[5] data, the average penetration of mobile telephony services decreased slightly in selected European countries compared to 2016. According to the company, the penetration of mobile telephony services in Poland amounted to 134.1%, which was still higher than average, at 129.9%, on the European market.

[5] An analytical company specializing in the telecommunications market research.

Chart 17

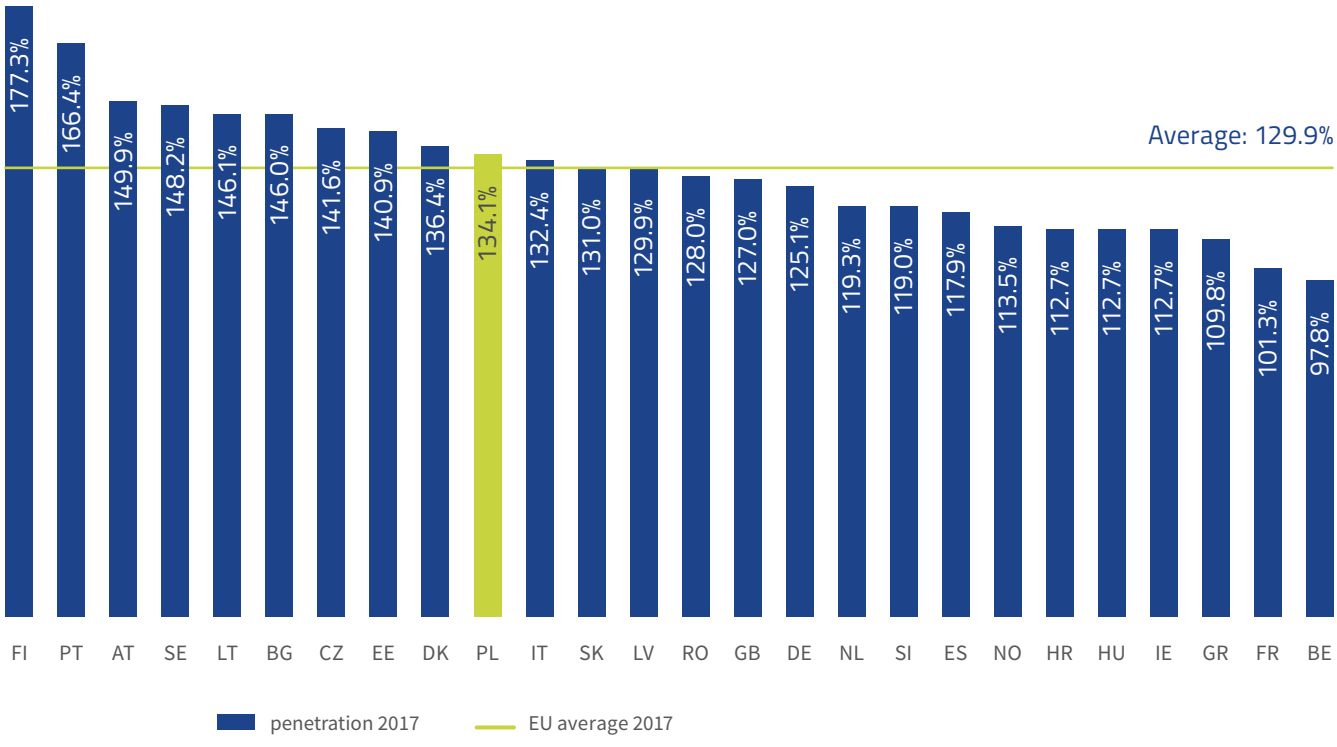
Share of pre-paid and post-paid customers in the total number of subscribers



Source: UKE, based on operators' data

Chart 18

Mobile penetration in selected European countries in 2017



Source: UKE, based on the Telecom Market Matrix database, Analysys Mason

2.2. Revenues

The declining trend in revenues from mobile telephony services, which started in 2012, still persists. In 2017, the total revenues of operators amounted to PLN 15 billion and were by almost 11% lower than a year earlier.

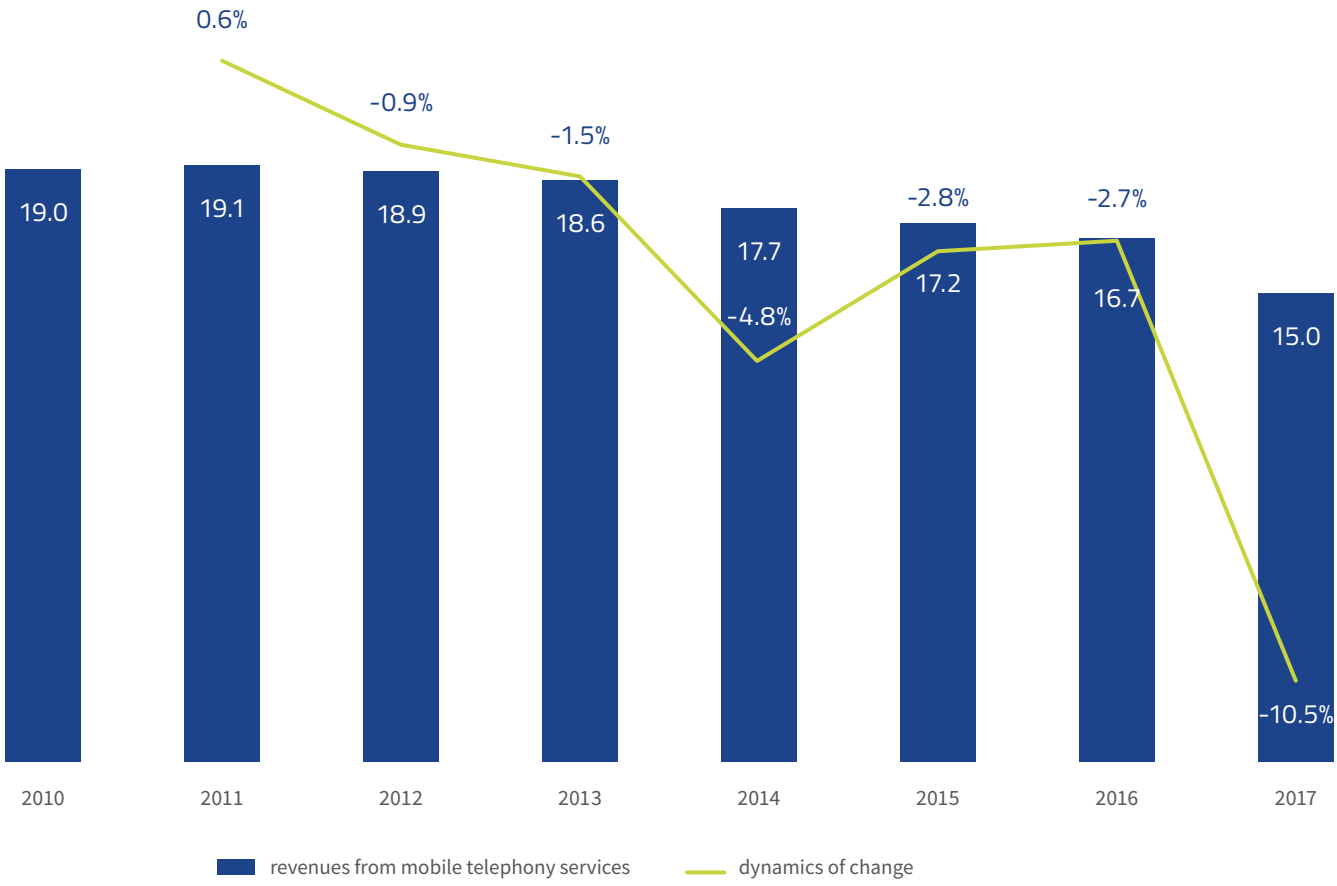
The drop in revenues concerned almost all areas of mobile telephony. The following revenues decreased: from subscription fees (by 4.5%) and from voice calls (by over 17%), from SMS messages (by more than 24%) and from MMS messages (by almost 5%) and from outbound roaming (by almost 14%).

The services that brought higher revenues than a year earlier included data transmission and inbound roaming. The revenues from the services increased respectively to PLN 3.8 billion and PLN 201.2 million (i.e. by 16.4% and 27.9%).

Despite declining value of the mobile telephony market, it still constituted a key area of telecommunications activity, accounting for 38% of total revenues from this sector.

Chart 19

Revenues from mobile telephony services (PLN bn) and the dynamics of change



Source: UKE, based on operators' data

2.3. Shares of operators

At the end of 2017, the leading position in terms of the number of mobile telephony users was taken over by P4 with a 30% share. Orange, enjoying the title for years, took the second position with the result of 27%. Polkomtel came third in the ranking with a 19.7% share, while T-Mobile ranked fourth with 19.1% of the SIM card market. Of the four largest companies, only P4 saw an increase in the number of users. The number of SIM cards owned by it amounted to 15.1 million, i.e. 5.4% more than in the previous year. The remaining three companies lost from 2.3% of the market in the case of T-Mobile up to 15.1% in the case of Polkomtel. Orange lost 8.9% of users. The share in the number of SIM cards of other operators increased to a small extent (from 4.1% to 4.3%).

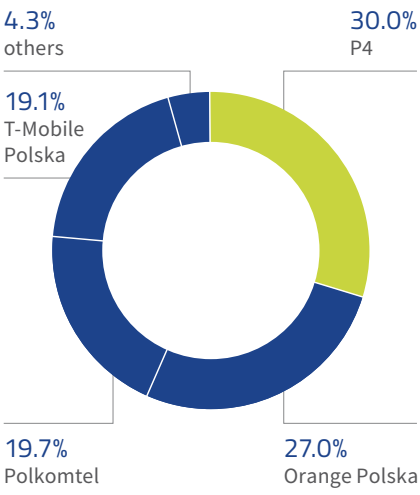
In terms of revenues, the first in the ranking in 2017 was Polkomtel with a share of 27.6%. Orange was the second with 26.5% of the mobile telephony market.

The high position of P4 in terms of the number of SIM cards did not translate into a better result in terms of revenues. The operator took third position in the ranking with a result of 23.4%. The revenues of T-Mobile constituted 19.7% of total revenues from the mobile telephony market. The share of each of the four main players dropped in favour of the remaining companies, they obtained the result of 2.8%.

Orange had the largest percentage of revenue from data transmission in mobile networks in 2017. The company owned almost 40% of this market, by 2 pp. less than in 2016. P4 was the second, it gained 27.3% of the data transmission market revenue. In this case, we can call it an increase, it amounted to 1.9 pp. T-Mobile ranked third, with a share of 26% compared to 23.8% in the previous year. Polkomtel remained far behind, its share was less than 7%, by 2 pp. less than in 2016. The percentage of the group of other operators was negligible, at the level of 0.1%.

Chart 20

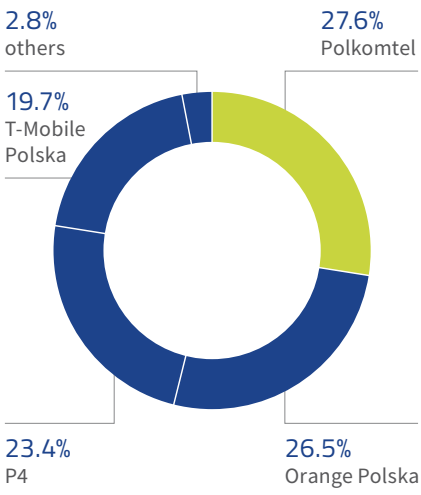
Shares of operators in terms of number of users in 2017



Source: UKE, based on operators' data

Chart 21

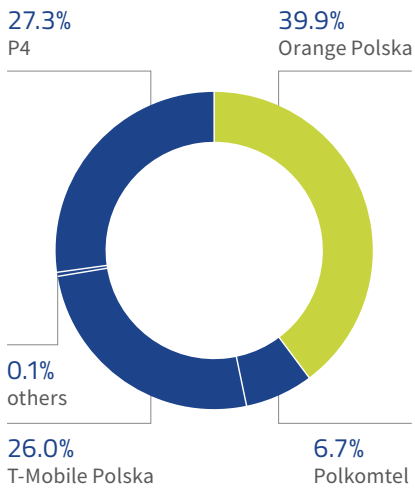
Shares of operators in terms of revenue generated in 2017



Source: UKE, based on operators' data

Chart 22

Shares of operators in terms of revenue from data transmission services in 2017



Source: UKE, based on operators' data

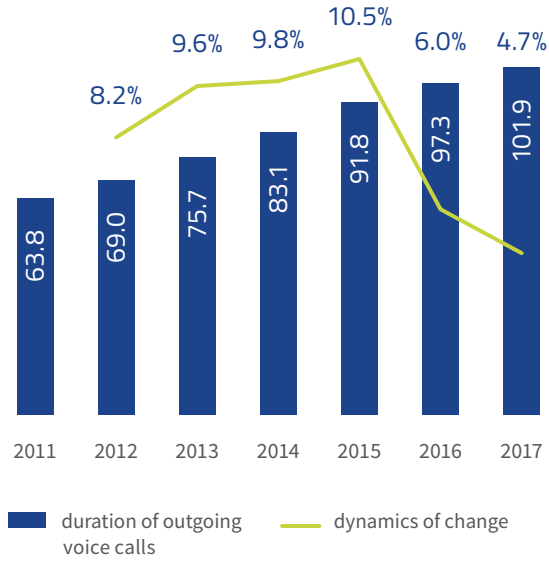
2.4. Volumes of services provided

Admittedly, the duration of outgoing calls in mobile telephony in recent years was characterized by an increase, however, in the past two years the growth rate has significantly decreased (from 10.5% in 2015 to 4.7% in 2017). Customers of telecommunications services made calls in 2017 with a total duration of 101.9 billion minutes. It means that statistically, for each inhabitant of Poland, there were 2,652 minutes of voice calls per year, 120 minutes more than the previous year. The average duration of the call was 2 minutes and 18 seconds and was longer by 6 seconds compared to 2016.

In terms of the monthly use of services, compared to selected European countries, Poland was at a slightly higher level than the EU average. Subscribers to Polish mobile networks talked on average 167 minutes a month, which is 5 minutes more than the average in European countries, which was 162 minutes.

Chart 23

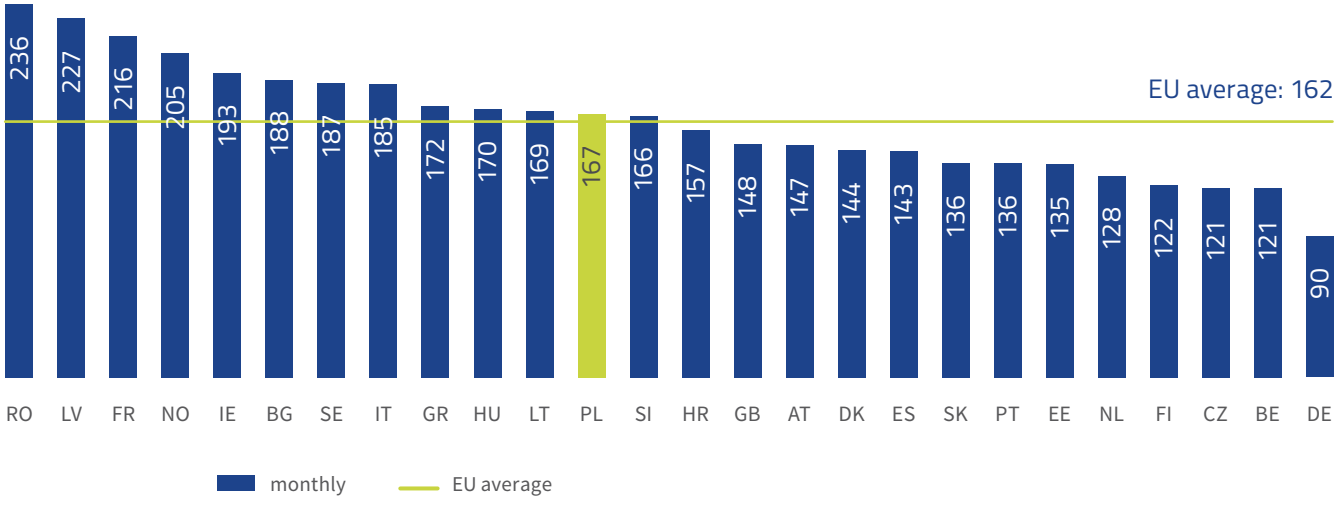
Total duration of voice calls and the dynamics of change



Source: UKE, based on operators' data

Chart 24

Average duration of voice calls per active user per month in 2017 in selected EU countries (minutes)



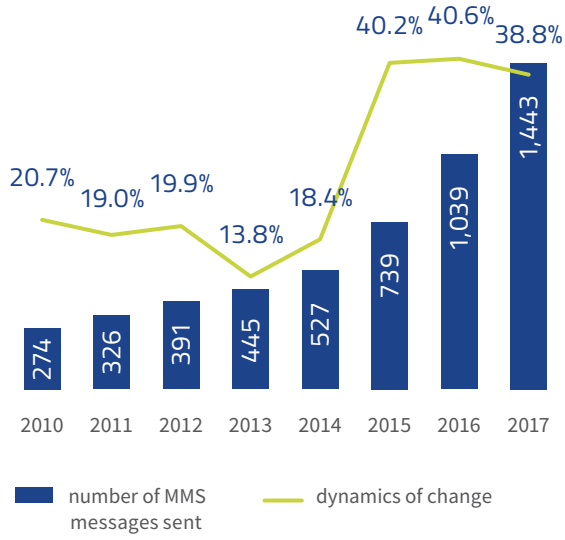
Source: UKE, based on the Telecom Market Matrix database, Analysys Mason

A slight decrease was recorded in the number of SMS messages sent, however, the dynamics of decline was lower than in the previous year. In 2017, a total of 49.2 billion text messages were sent, 2% less than in 2016. This form of communication is more and more often being replaced by other communication options, such as, for example, instant messaging, social networks, e-mail and other messages sent via internet.

The service of sending MMS messages is still attracting unwavering interest in Poland. In 2017, a total of 1.4 billion messages were sent, i.e. almost 39% more than the year before. On average, 38 messages were sent per one inhabitant of Poland against 27 in the previous year.

Chart 26

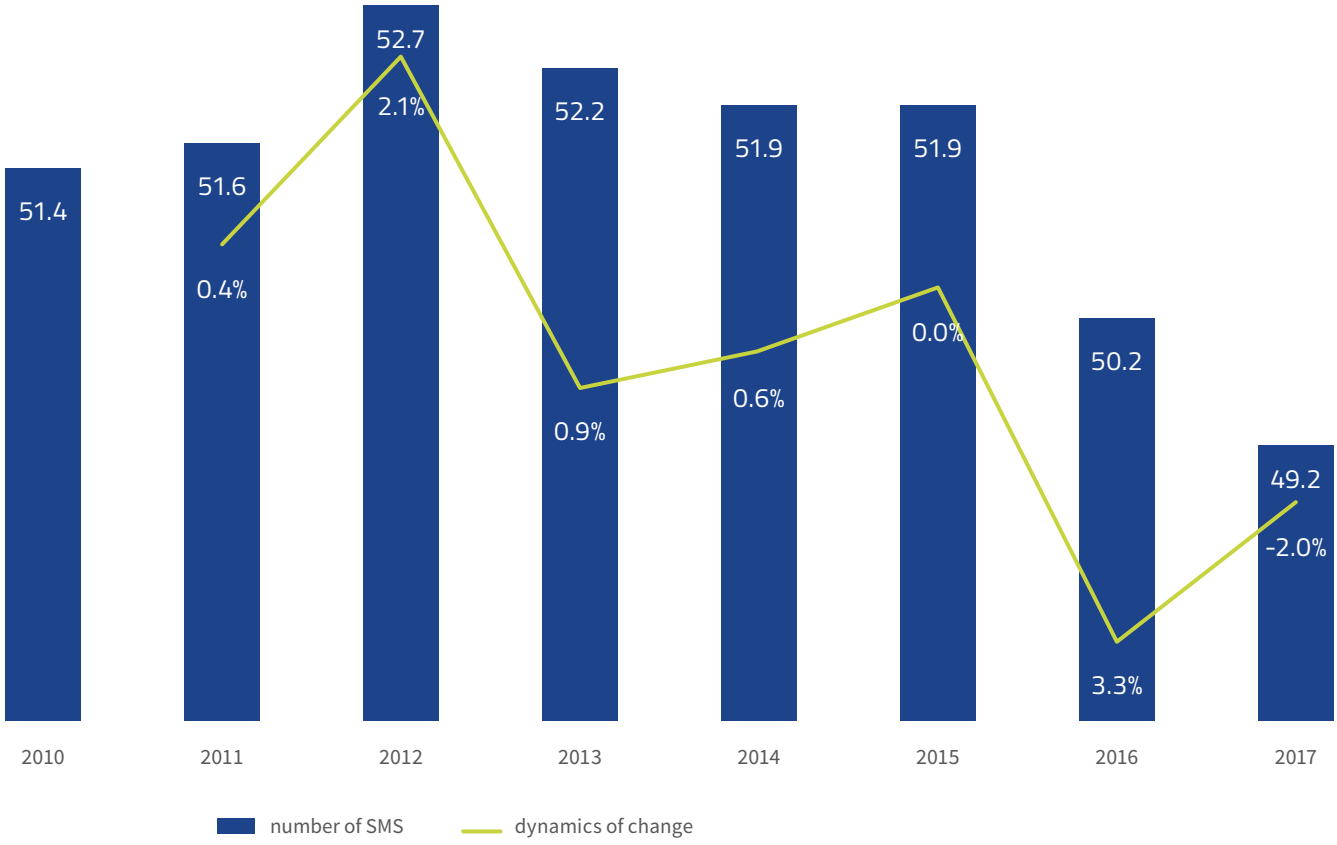
Number of MMS sent (million) and the dynamics of change



Source: UKE, based on operators' data

Chart 25

Total number of SMS sent (billion) and the dynamics of change



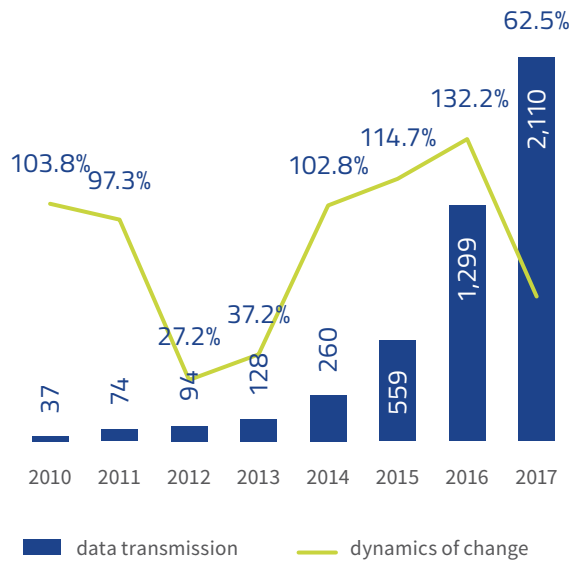
Source: UKE, based on operators' data

Comparing Poland's data in the area of SMS / MMS messages sent in 2017 per one active user and the data from selected European Union countries, our country is well above the average of 59. In Poland, on average, one active user sent 77 messages per month, i.e. 18 more than the average in the European Union.

The fastest developing service in mobile networks has been data transmission for many years. Increasingly large data packages offered by operators have certainly significant impact on its dynamic development, together with increasing range of high-speed networks, thanks to which the use of the service is increasing each year. In 2017, customers transferred 2.2 EB of data, which means an increase by 62.5% in relation to 2016. The share per one resident in Poland was on average 53.6 GB of data annually, compared to 33.8 GB sent a year earlier.

Chart 28

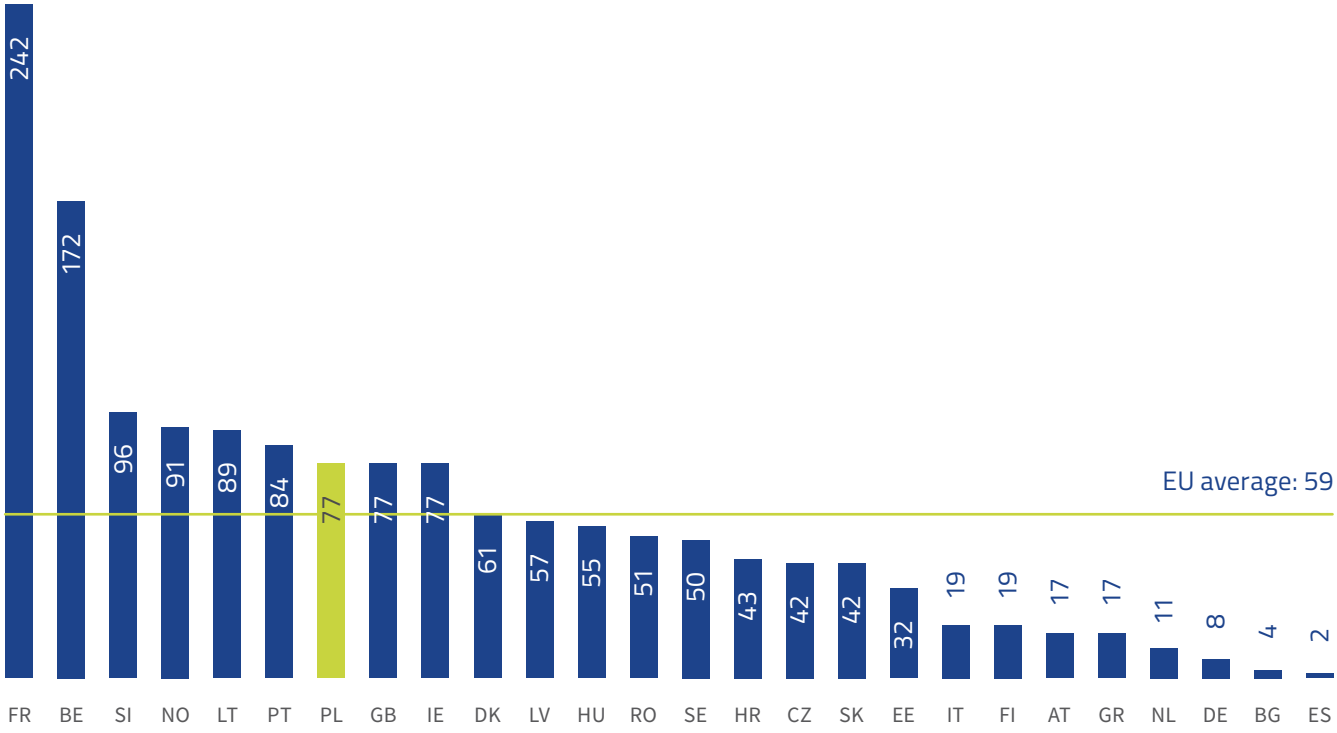
Volume of data transmission (PB) and dynamics of change



Source: UKE, based on operators' data

Chart 27

Average number of SMS / MMS sent per month per active user in selected EU countries in 2017



Source: UKE, based on the Telecom Market Matrix database, Analysys Mason

2.5. 3G and 4G/LTE coverage

Mobile networks in Poland are constantly evolving, gaining better and higher parameters, and reaching a growing number of users. 100% of our country is covered by the 3G network and 99.9% by the 4G/LTE network.

100% 3G coverage is offered by one of the undertakings with its own infrastructure. Other infrastructure operators also offer services with such parameters, although a slightly smaller number of residents can use them. The operator with the smallest 3G network coverage declares that as much as 94.7% of the population can use the services provided in its network.

The coverage of the LTE network is also increasing from year to year and an increasing number of subscribers can use these networks. Despite the fact that in 2017, as in the previous year, services reached 99.9% of the population, the network of the operator with the lowest coverage covered by 1.5% more people than in the previous year.

Table 2

Percentage of population within 3G coverage in 2017

Operator	% of population within 3G network coverage
Operator 1	100.0%
Operator 2	99.8%
Operator 3	99.8%
Operator 4	99.6%
Operator 5	94.7%

Source: UKE, based on operators' data Note: Operators appear in descending order

Table 3

Percentage of population within 4G/LTE coverage in 2017

Operator	% of population within 4G/LTE network coverage
Operator 1	99.9%
Operator 2	99.8%
Operator 3	99.0%
Operator 4	93.4%
Operator 5	89.9%

Source: UKE, based on operators' data Note: Operators appear in descending order

The order in Table 2 does not have to be equivalent to the order in Table 3

2.6. Cost of using mobile telephony

[6] The database is developed by the analytic company Strategy Analytics

Data from the OECD Mobile Voice Price Benchmarking[6] database was used to compare prices in Poland and other European Union countries.

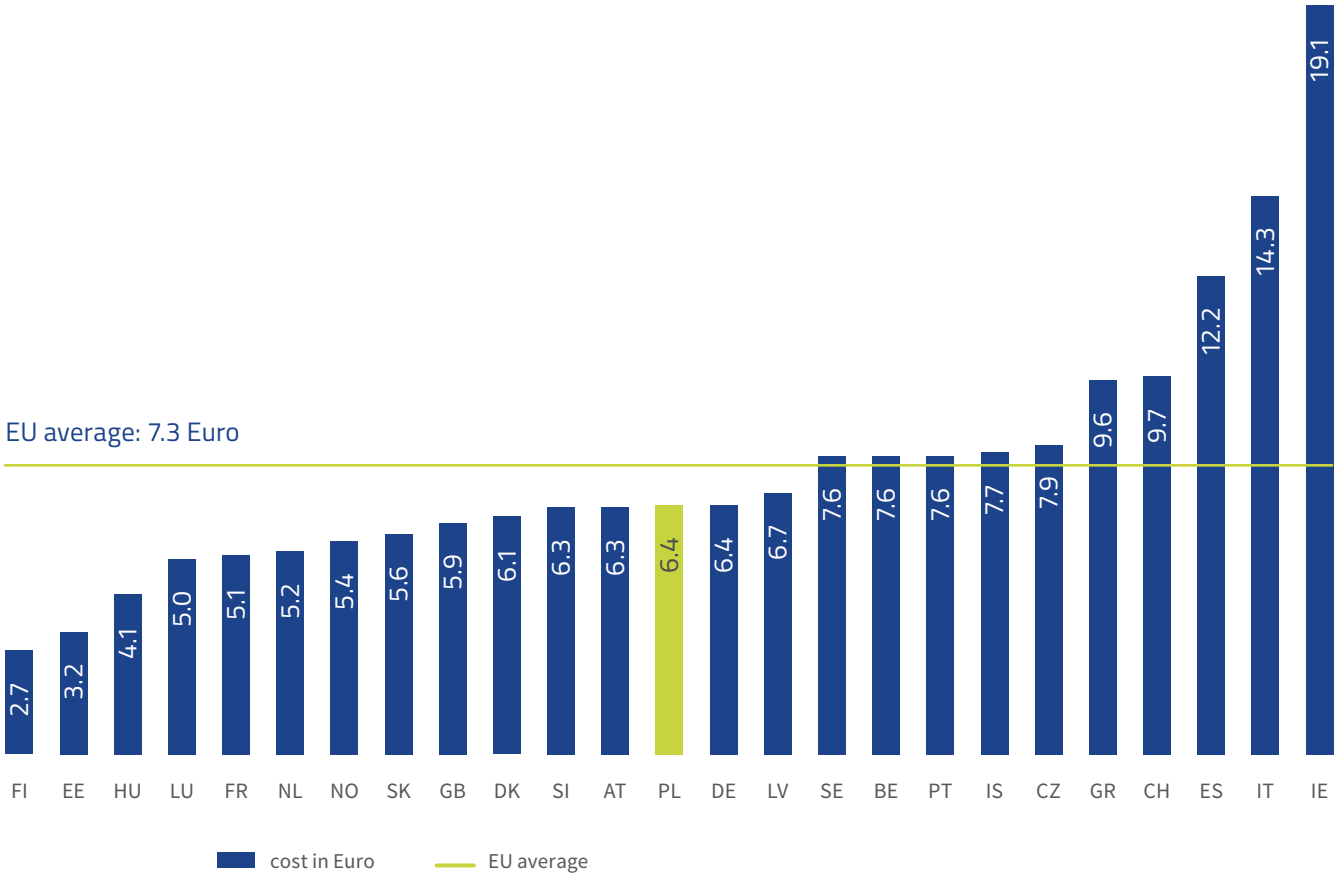
The average monthly cost of services provided to individual users, characterized by low, moderate and high use of mobile telephony services, was taken into account. The cheapest offer from November 2017 was chosen for each basket and country.

A comparative analysis showed that the value of the basket of mobile telephony services in Poland was one of the lowest in Europe, in particular in the case of moderate and intensive use of the services.

Using mobile telephony services occasionally, customers of the Polish network paid EUR 6.4 per month. The offer of the domestic operator was, therefore, 1 Euro cheaper than the EU average, which amounted to 7.3 EUR.

Chart 29

Average monthly cost of using mobile services with low usage of services in 2017



Source: UKE, based on OECD Mobile Voice Price Benchmarking

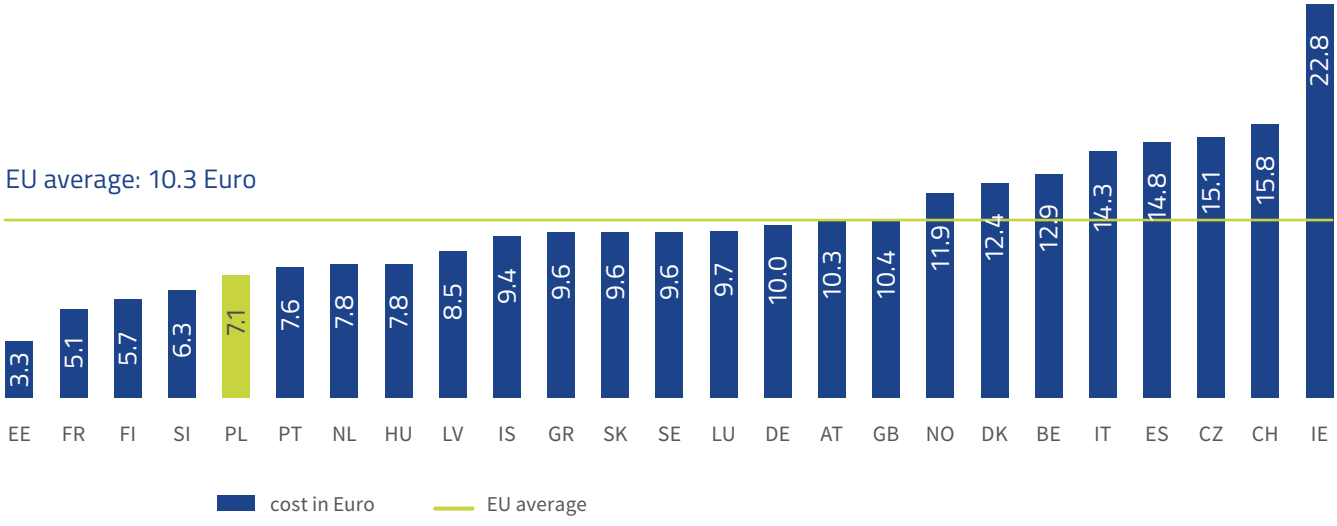
Comment: The "Mini Mix Plus PLN 20, 24 months" offer was chosen for Poland

The average use of mobile network services in Poland was associated with a cost of EUR 7.1, while on average 3 EUR more were paid in selected European countries.

Considering the basket for very active users, Poland is at the forefront of European countries with the lowest fee. Intensive use of the voice service in the mobile network in Poland was associated with a fee of EUR 7.1 and was lower by EUR 6.6 than the European average.

Chart 30

Average monthly cost of using mobile services with moderate usage of services

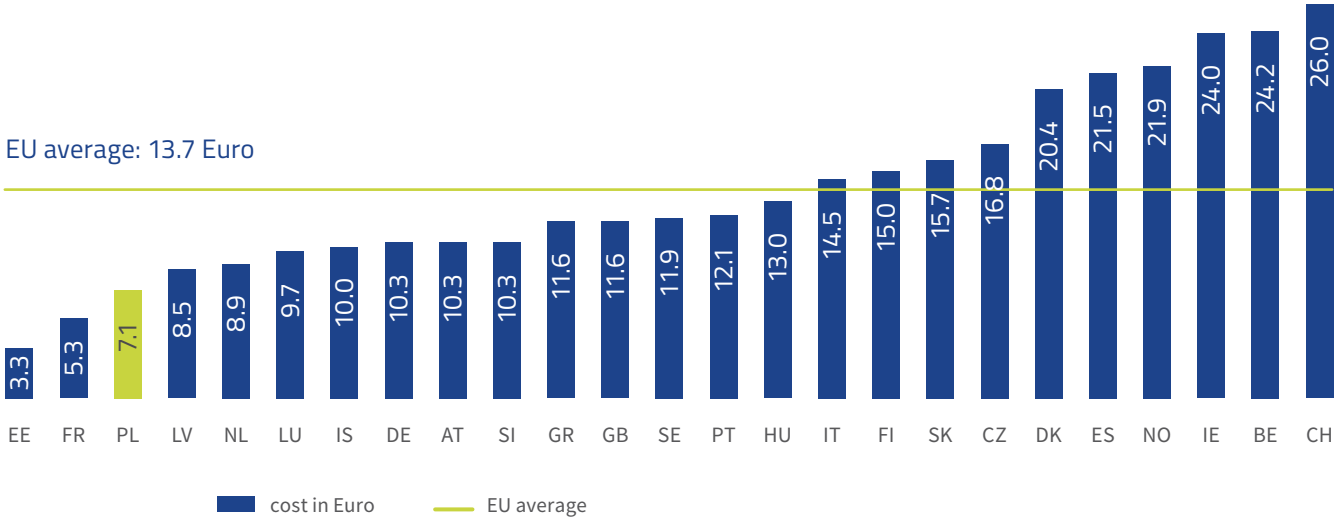


Source: UKE, based on OECD Mobile Voice Price Benchmarking

Comment: The "Prepaid Plus – Full Option 6GB" offer was chosen for Poland

Chart 31

Average monthly cost of using mobile services with high usage of services



Source: UKE, based on OECD Mobile Voice Price Benchmarking

Comment: The "Prepaid Plus – Full Option 6GB" offer was chosen for Poland

2.7. Roaming

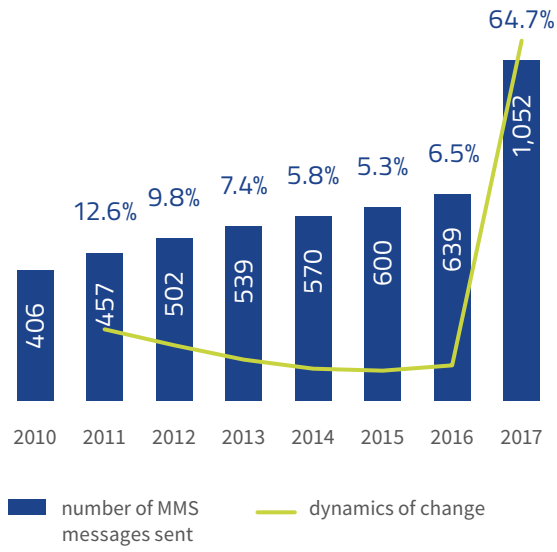
The introduction of the "Roam Like At Home" principle in June 2017 made international roaming services very popular. The same rates for voice calls, SMS messages and data transmission in Poland and in other European countries resulted in the fact that customers of Polish operators could use their phones in the European Union under the same conditions as domestically. Thanks to this, the volumes of services significantly increased.

The duration of calls made in 2017 by mobile roaming subscribers totalled 3.2 billion minutes, which means more than a twofold increase compared to 2016.

The number of SMS messages sent in international roaming has been systematically growing in recent years. Particularly rapid growth was recorded in 2017. The subscribers of Polish networks using roaming abroad sent over 1 billion SMSs, approx. 65% more than the year before.

Chart 33

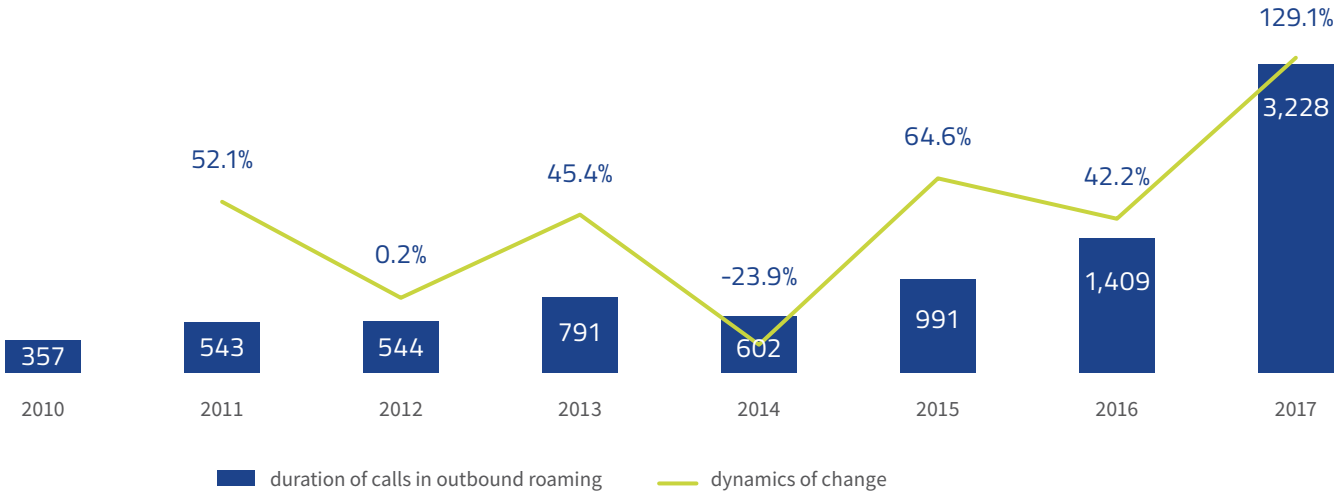
Total number of SMS messages sent in outbound roaming (million)



Source: UKE, based on operators' data

Chart 32

Total duration of voice calls in outbound roaming (million minutes)



Source: UKE, based on operators' data

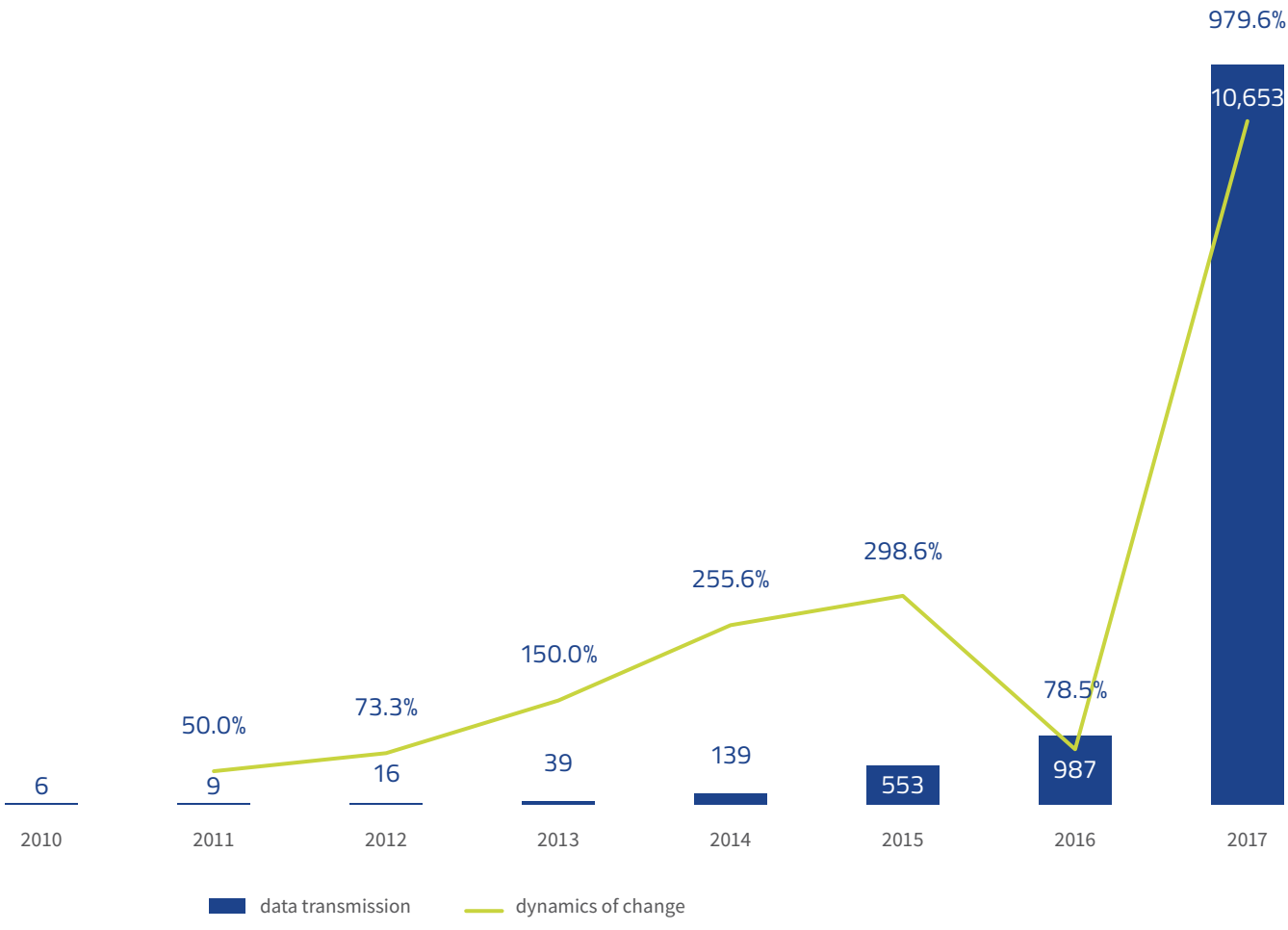
Data transmission was the most dynamically developing roaming service. The introduction of the same rates in the EU resulted in subscribers of Polish operators transferring more than ten times more data than the year before.

Retail roaming surcharges were charged until June 14, 2017 in the amounts introduced after April 30, 2016.

This was the so-called transition period in the changes to roaming, that is, determining the level of the maximum surcharge that the operator could charge from a subscriber in addition to the standard domestic fee. When settling subscribers' accounts for the use of services, operators could not exceed the maximum retail rate.

Chart 34

Total data transmission volume (million MB) in outbound roaming



Source: UKE, based on operators' data

3. Bundled services

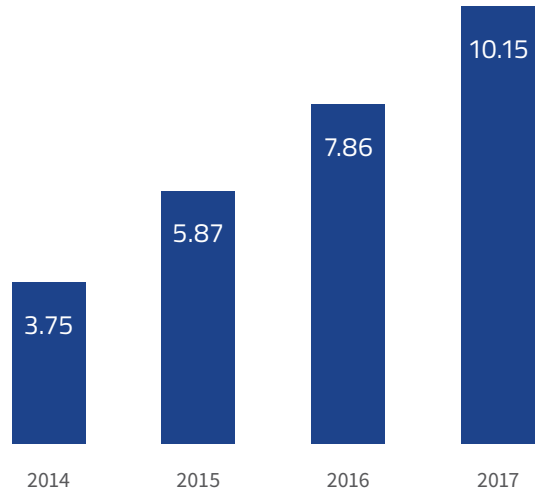
3.1. General information

Bundled services are one of the most dynamically developing segments of the telecommunications market. Over the past 4 years, the number of users increased from 3.75 million to 10.15 million.
The dynamic development of the services is also visible when comparing year to year data. Compared to 2016, the number of users increased by 29%.

In 2017, the "Mobile telephony + mobile internet" service was still the most popular bundle, the market share of it in terms of the number of users amounting to over 60%. This is an increase, compared to 2016, by over 6 pp. The "Fixed-line internet service + TV" was the second in terms of popularity (11%) and the "Fixed-line telephony+ Fixed-line internet + TV" (7.2%) was the third.

Chart 35

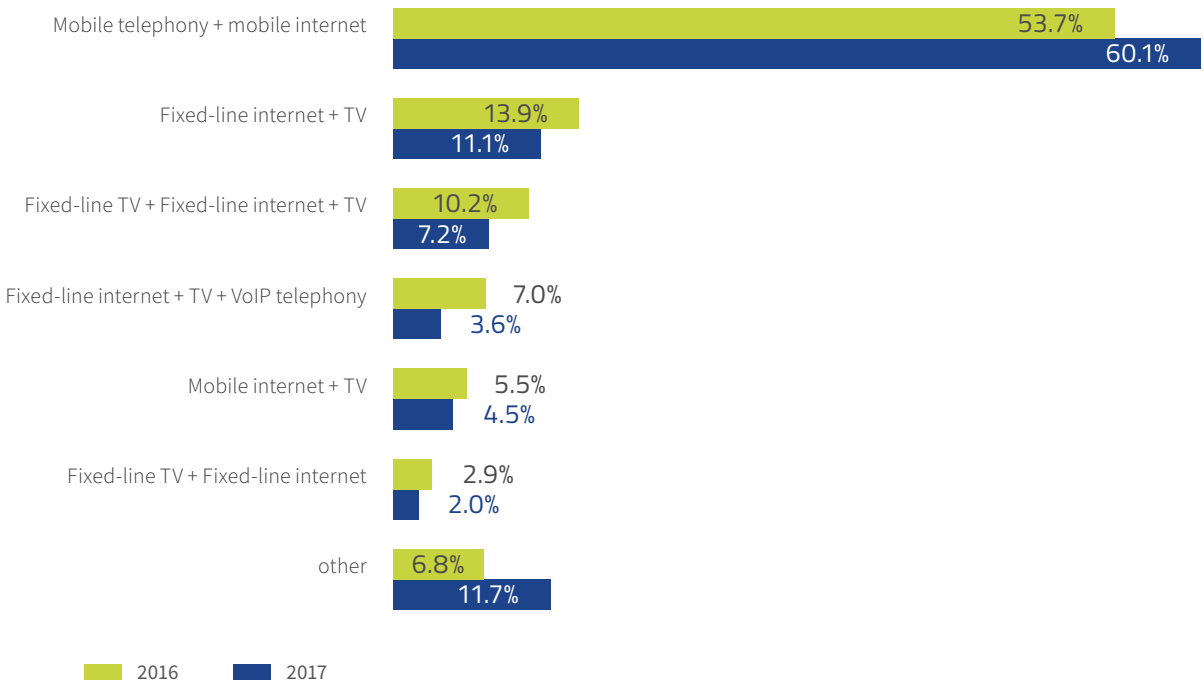
Number of users of bundled services (million)



Source: UKE

Chart 36

Most popular bundles



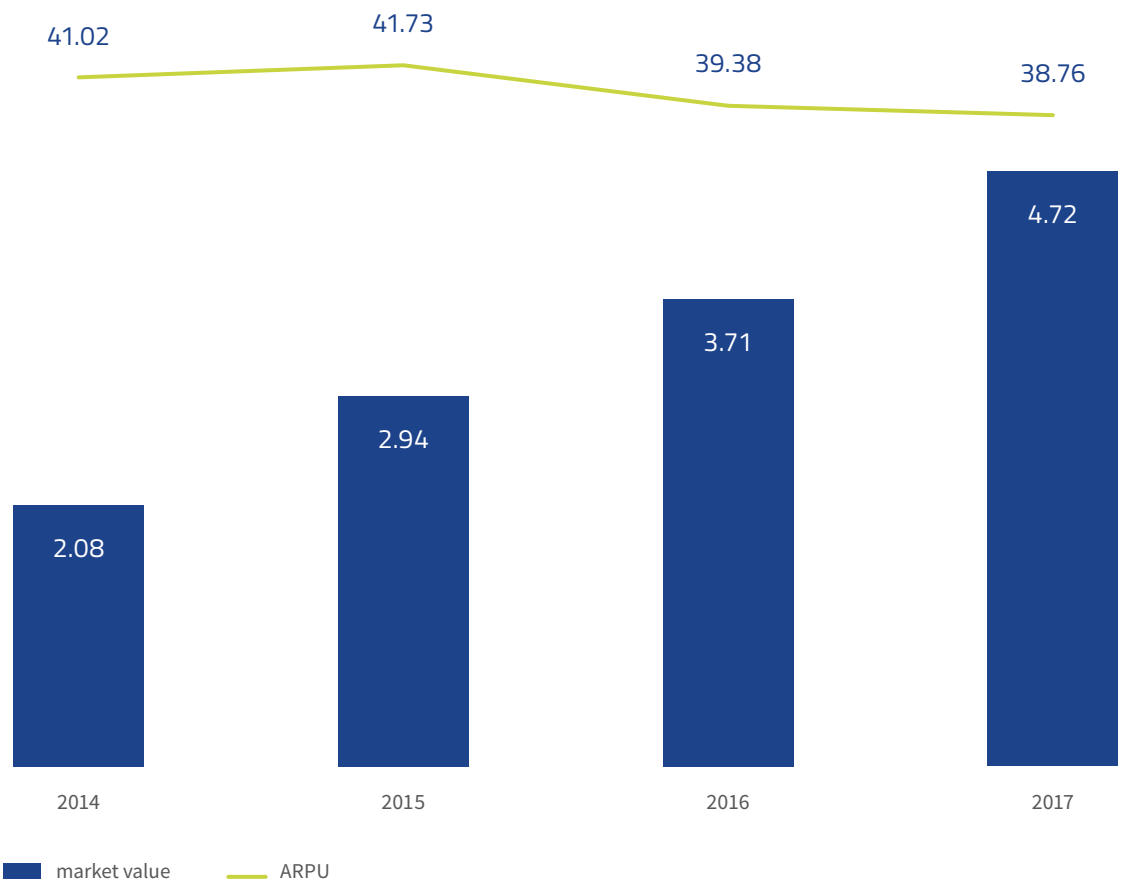
Source: UKE

3.2. Revenues

In the case of revenues, the trend in the bundled services market is analogous to the number of users. The market value since 2014 more than doubled, from PLN 2.08 billion to PLN 4.72 billion. The average monthly revenue per user for this type of services amounted to PLN 38.76 in 2017, i.e. PLN 0.6 less than in 2016.

Chart 37

Market value (PLN billion) and average monthly revenue per user (ARPU in PLN)



Source: UKE

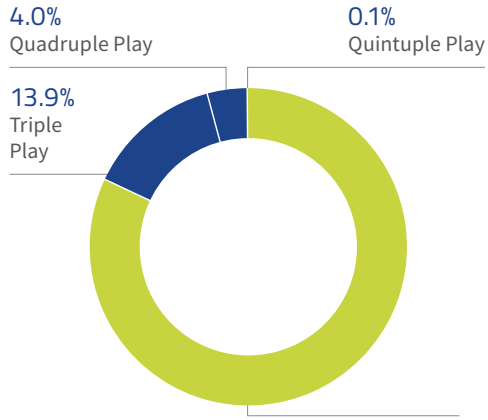
3.3. Subscribers

Users most often decided to purchase bundles consisting of two services. 82% of them used the Double Play service. Triple Play bundles ranked second in popularity with a 14% share. Only 4% of subscribers used bundles consisting of four services.

More than 73% of all users of the Double Play service had the "Mobile telephony" + mobile internet" bundle in 2017. The "Fixed-line internet + TV" bundle was definitely less popular, its share being at the level of 13.5%.

Chart 38

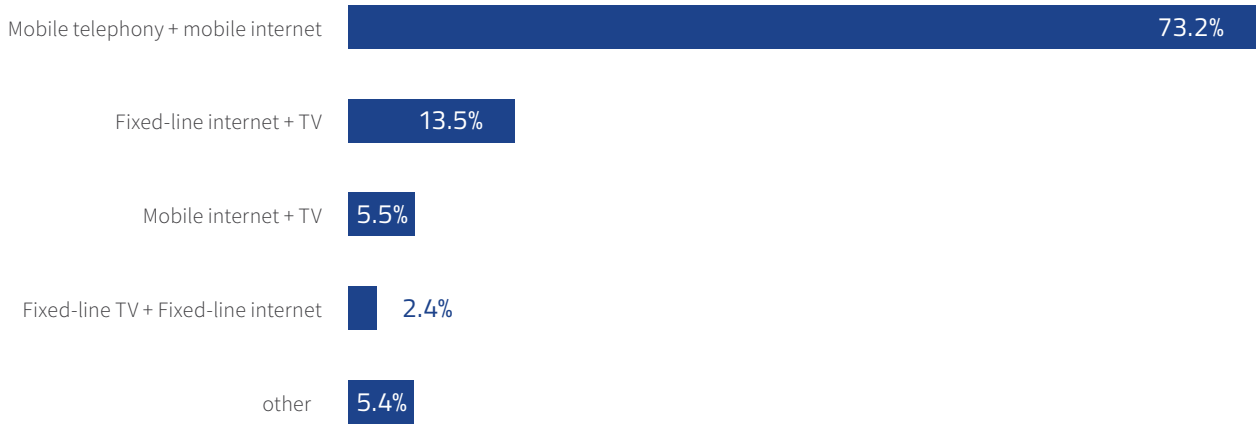
Bundles share in terms of number of users



Source: UKE

Chart 39

Share of individual Double Play bundles in terms of number of users



Source: UKE

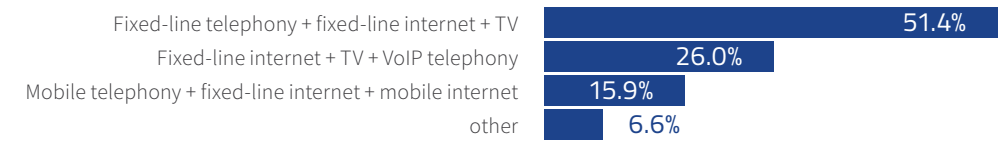
Among the Triple Play bundles, the "Fixed-line telephony + fixed-line internet + TV" was the most popular service in 2017. The share of the users of this service among all users of bundles composed of three elements was at the level of over 51%. The second position was taken by the "Fixed-line internet + TV + VoIP Telephony" service (26%), and the third by the "Mobile telephony + fixed-line internet + mobile internet" service (approx. 16%).

The "Mobile telephony + fixed-line internet + TV+ VoIP telephony" had the greatest share in the number of users of Quadruple Play. It amounted to more than 89%. The second position was taken by the "Fixed-line telephony + Fixed-line internet + mobile internet + TV", with a share of 5.5%.

Approx. 97% of all users of bundled services composed of five elements in 2017 chose the "Fixed-line telephony + Mobile telephony + Fixed-line internet + mobile internet + TV" service. In turn, the "Mobile telephony + fixed-line internet + mobile internet + TV + VoIP telephony" service recorded a share in the number of Quintuple Play users at the level of 2.8%.

Chart 40

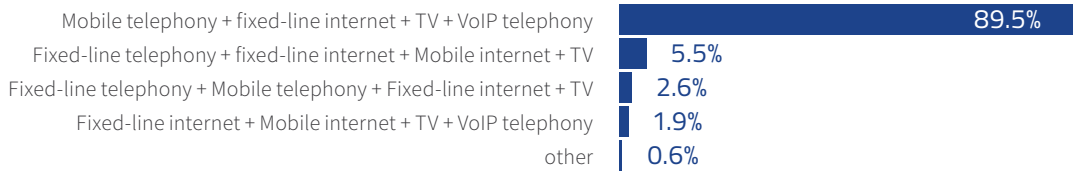
Shares of individual Triple Play bundles in terms of number of users



Source: UKE

Chart 41

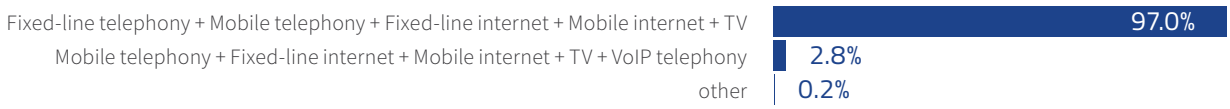
Shares of individual Quadruple Play bundles in terms of number of users



Source: UKE

Chart 42

Shares of individual Quintuple Play bundles in terms of number of users



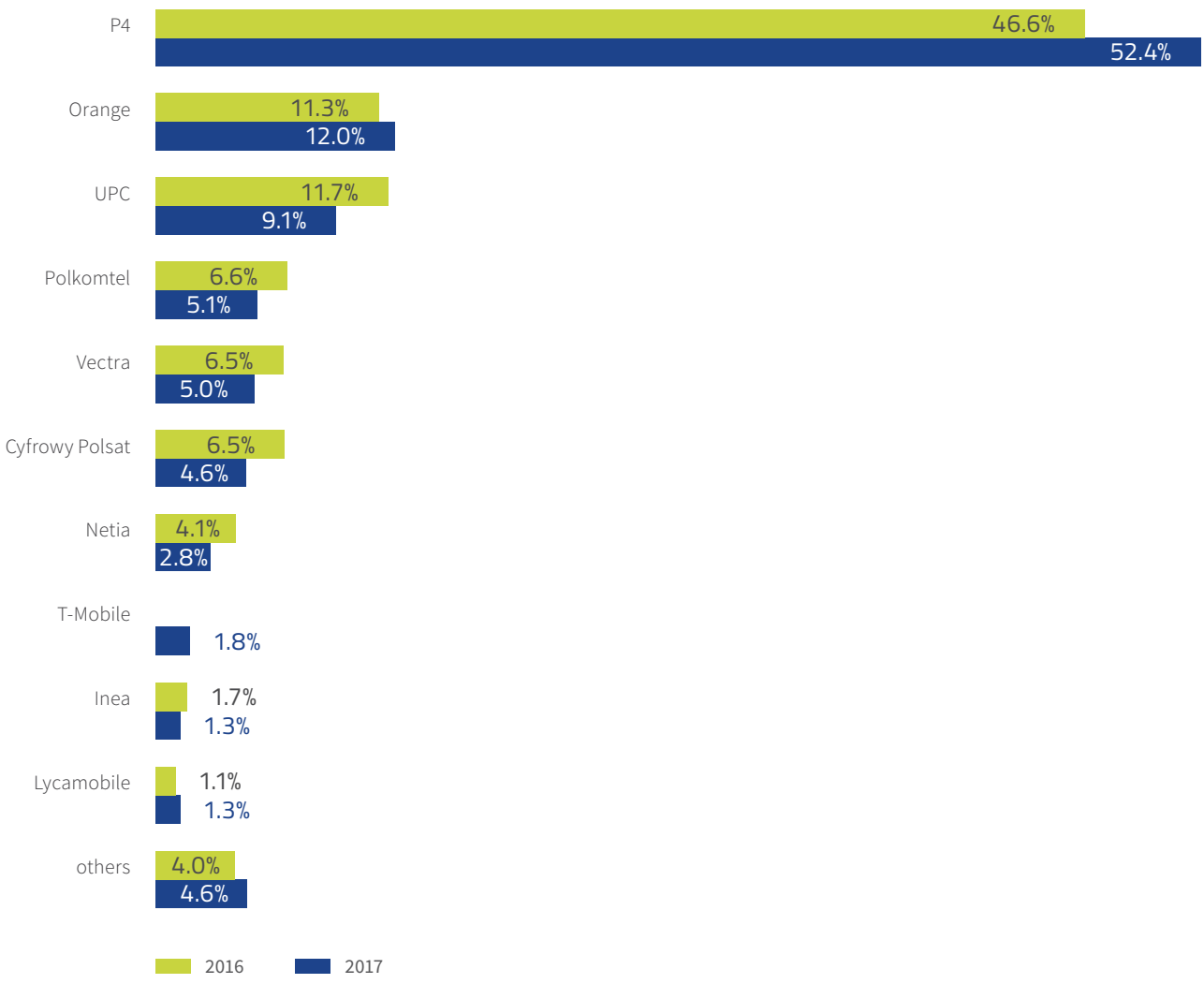
Source: UKE

3.4. Market structure

As in 2016, P4 had the largest share in the bundled services market in terms of the number of users. Its share was at the level of 52.4%, which means an increase of 6 pp year to year. A significantly lower share in the number of customers was held by Orange, with the second position in terms of popularity. The operator had approx. 12% of all users of bundled services in its customer database. UPC ranked third with a 9% share.

Chart 43

Shares of operators in terms of number of bundled services users



Source: UKE

4. Fixed-line telephony

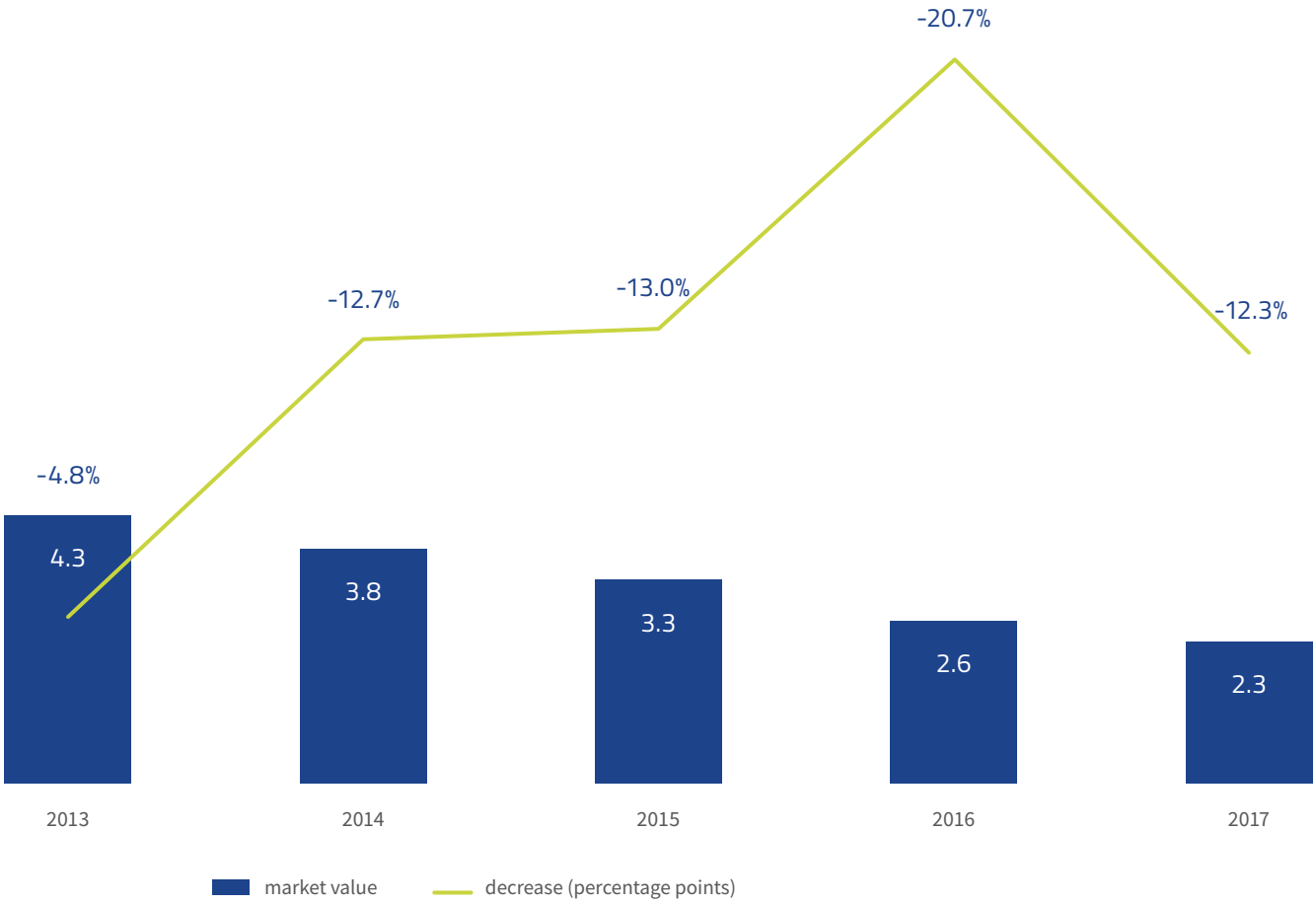
4.1. General information

In 2017, the downward trend was maintained for fixed-telephony services. It was visible both in terms of revenues and the number of users. In total, 4.8 million people used fixed-line telephony in 2017. The revenues in the analysed period amounted to PLN 2.3 billion. In comparison to 2016, the value of the telephony market at a fixed location decreased by PLN 0.3 billion, which means a decrease of 12.3%.

POTS is still the most popular fixed-line telephony technology. In 2017, POTS lines accounted for approximately 54% of all lines used. The ISDN technology took the second position (14%).

Chart 44

Value of fixed-line telephony market (PLN billion) and the dynamics of change



Source: UKE

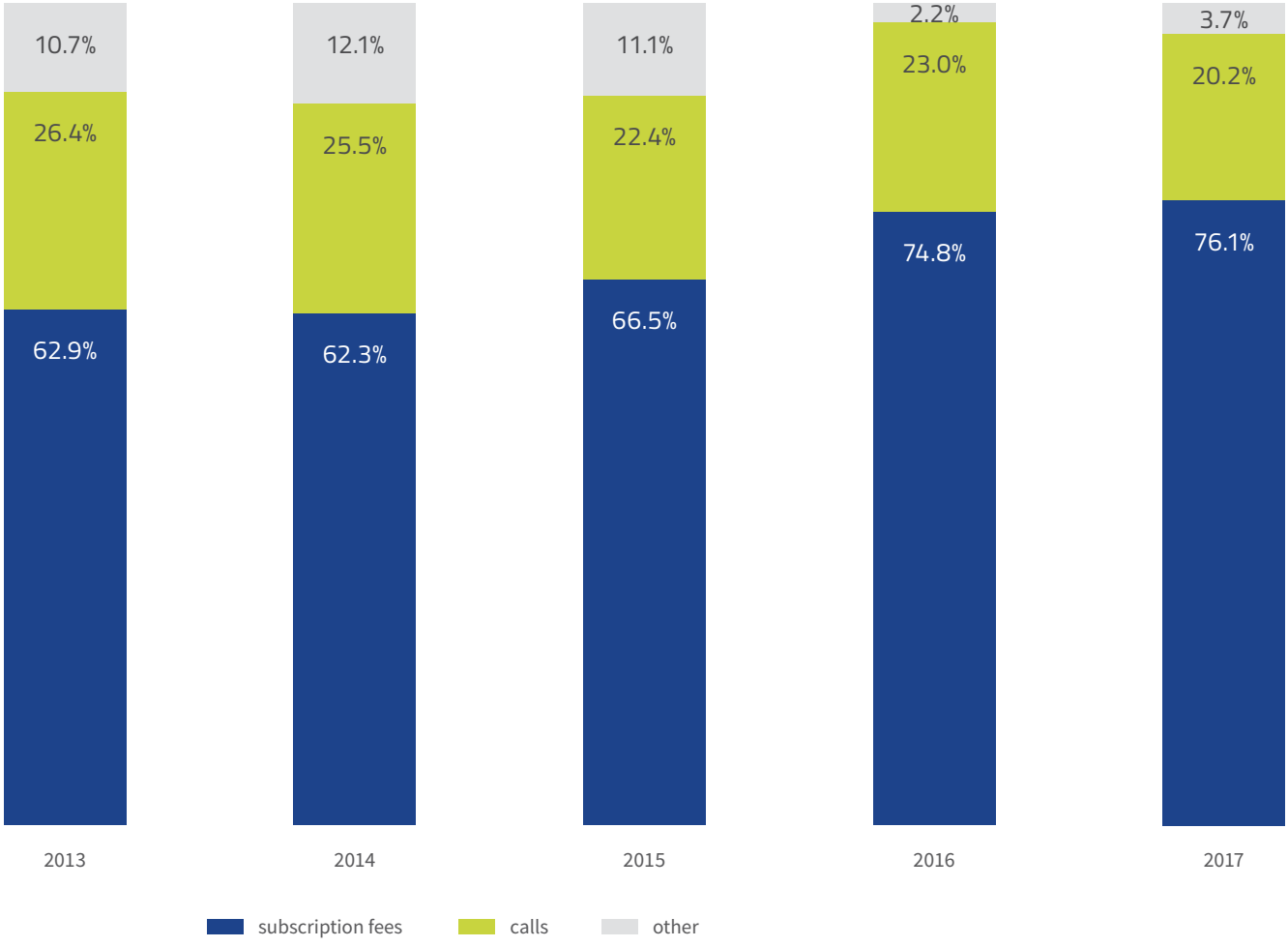
4.2. Revenues

Subscription fees remain the main source of revenues from the provision of fixed-line telephony services. In 2017, they contributed to over 76% of all revenues from this market segment.

Calls, on the other hand, generated approx. 20% of the revenues, which means a decrease by 3 percentage points compared to 2016.

Chart 45

Structure of revenues by service elements



Source: UKE

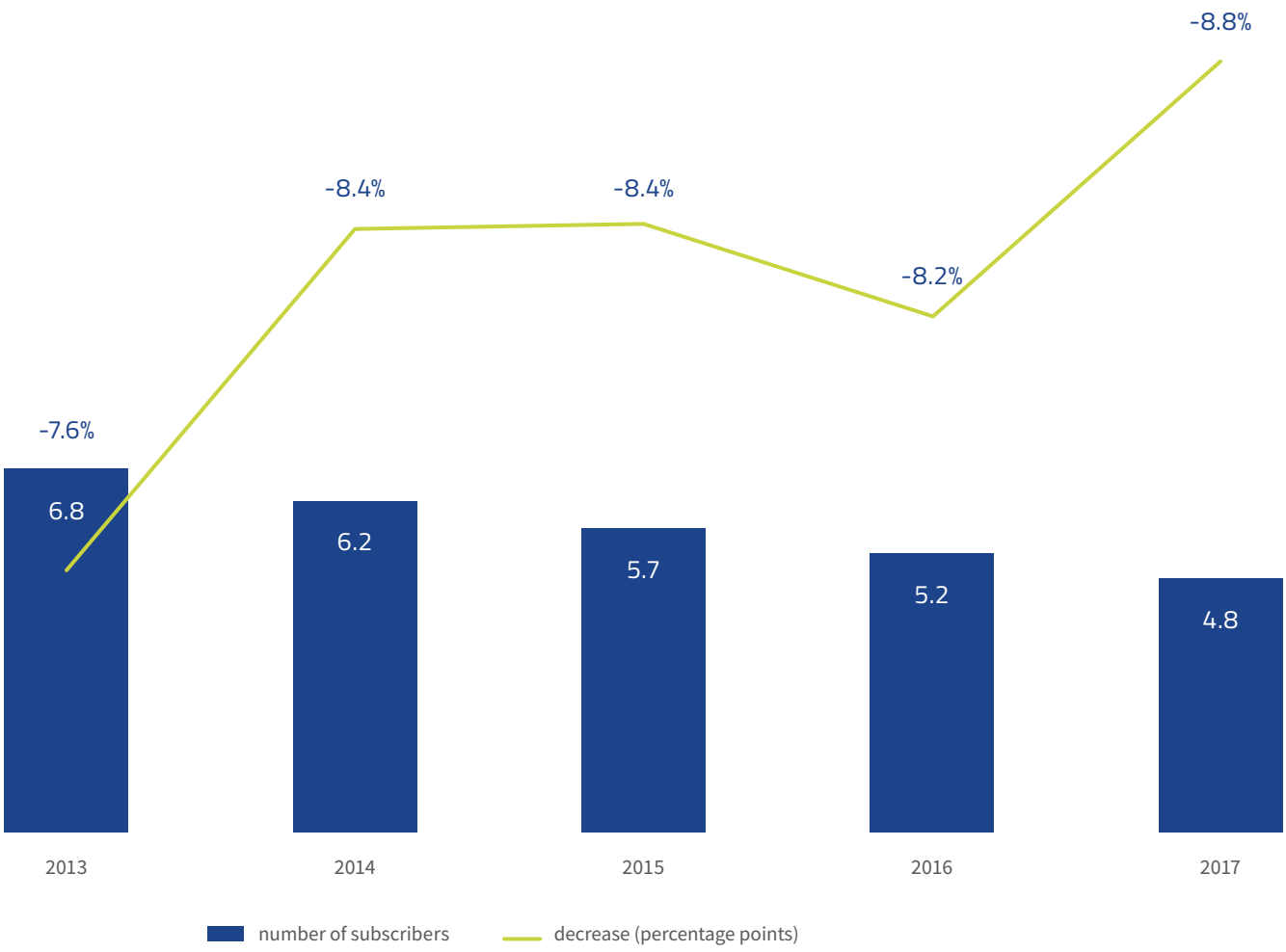
4.3. Subscribers

Year after year, both the revenue from and the number of subscribers to the fixed-line telephony service tend to decrease. In comparison to 2016, the decrease in this respect amounted to 8.8%. In 2017, the number of users of this service was at the level of 4.8 million. This was 0.4 million less than in 2016, when approx. 5.2 million people used the fixed-line telephony.

Changes in the market also affect the decrease in average monthly revenues per one subscriber. In 2017, this ratio was lower by PLN 1.5 than in 2016 and amounted to PLN 39.7.

Chart 46

Number of subscribers (million) and the dynamics of change



Source: UKE

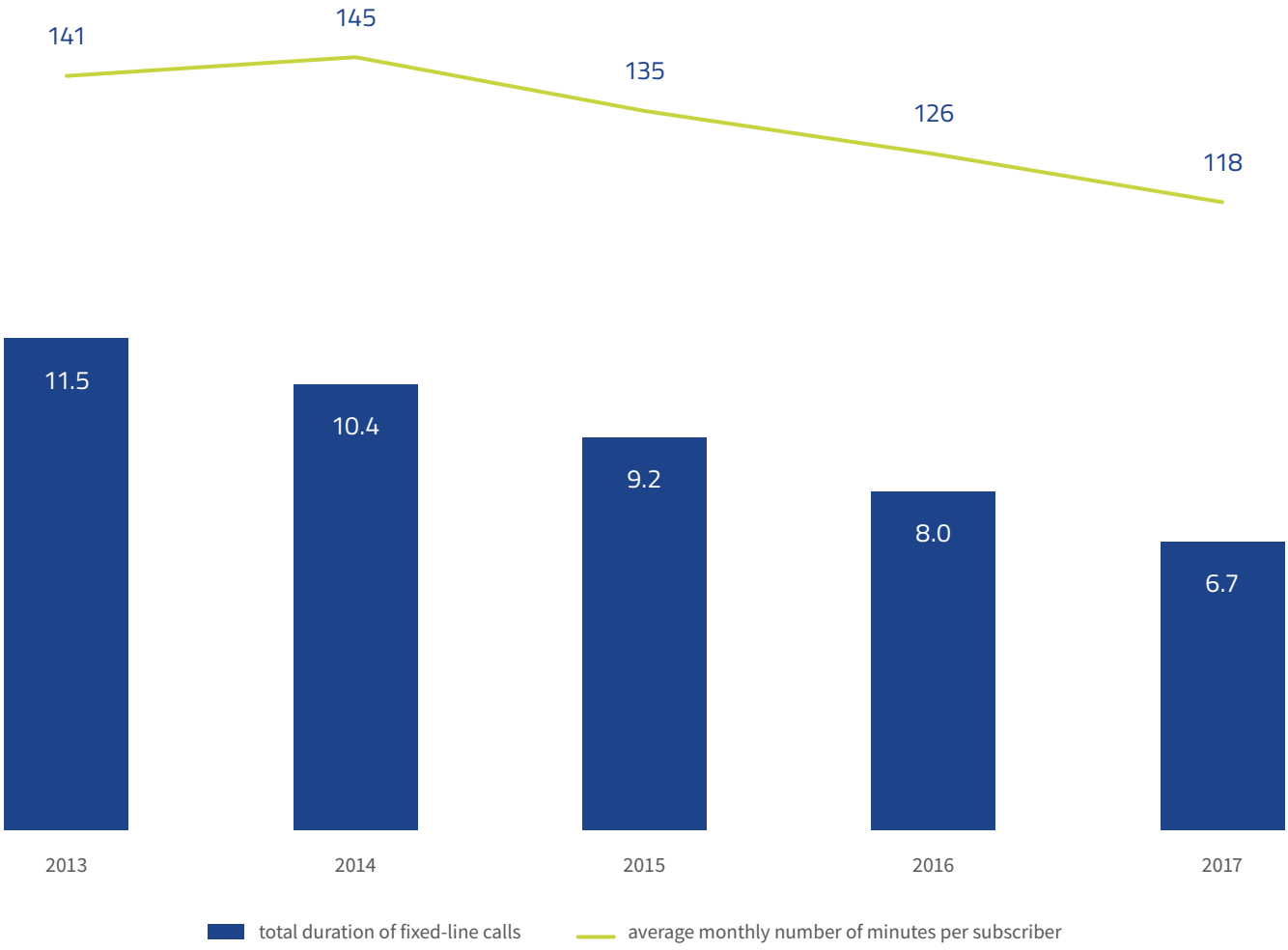
4.4. Traffic volume

In 2017, the total duration of fixed-line calls was approx. 6.7 billion minutes. It was a decrease by 1.3 billion minutes compared to 2016. This means that the downward trend seen over the past 5 years was maintained. The average monthly number of minutes per subscriber also decreased to 118 minutes in 2017.

More than 92% of all minutes in 2017 were domestic calls. Only 8% of the volume was the result of international calls.

Chart 47

Traffic volume (billion minutes) and average monthly number of minutes per subscriber



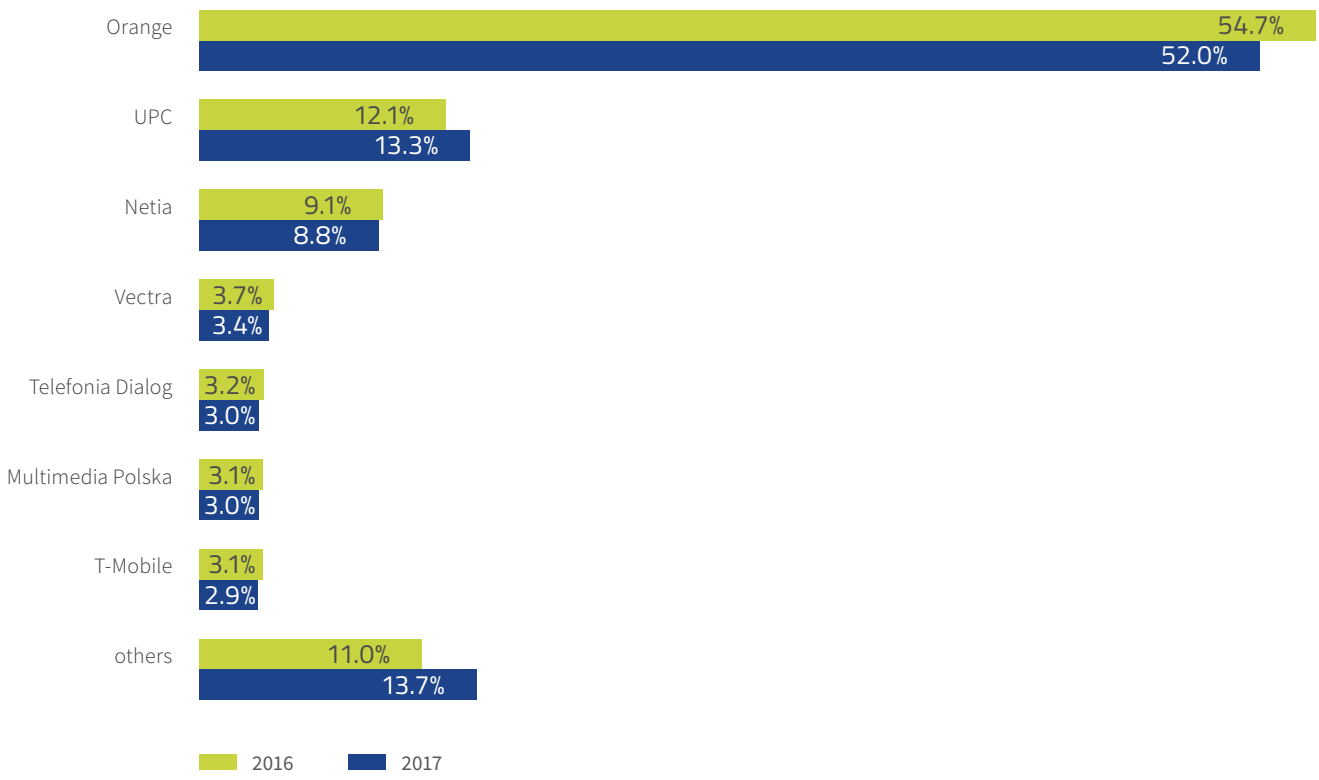
Source: UKE

4.5. Market structure

In 2017, Orange had the largest market share in terms of number of users. The share was 52%, i.e. 2.7 pp less than in 2016. UPC ranked second in terms of shares (13.3%), and the third position was taken by Netia (8.8%).

Chart 48

Operators' shares in terms of the number of subscribers



Source: UKE

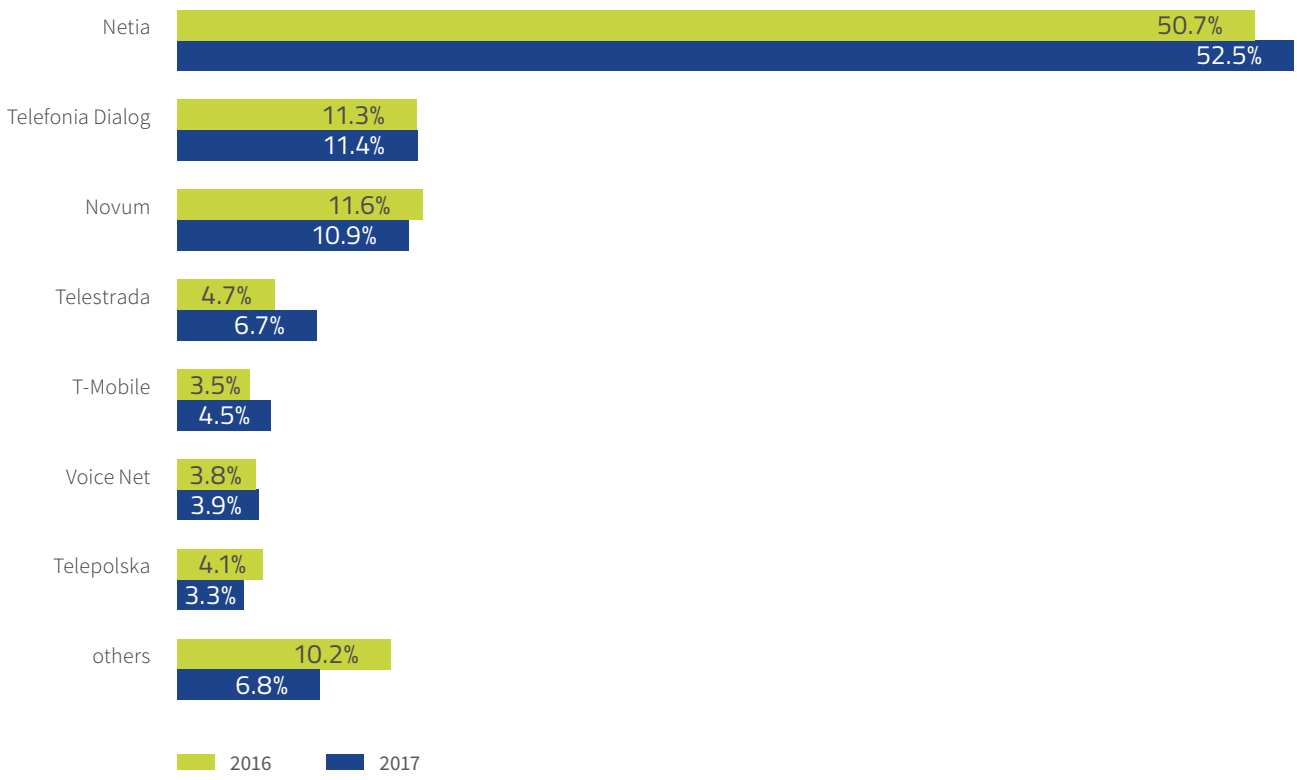
4.6. Wholesale Line Rental (WLR)

Revenues from wholesale line rental amounted to PLN 0.29 billion in 2017. This was worse than in 2016, when telecommunications undertakings recorded the revenue of PLN 0.36 billion. The largest share in the value of the WLR market in 2017 was obtained by Netia. It amounted to more than 52%. Telefonia Dialog (11%) and Novum (11%) recorded much smaller shares.

In total, approx. 0.57 million people used the WLR service in 2017.

Chart 49

Shares in revenue from the provision of WLR services



Source: UKE

4.7. Prices of fixed-line telephony service

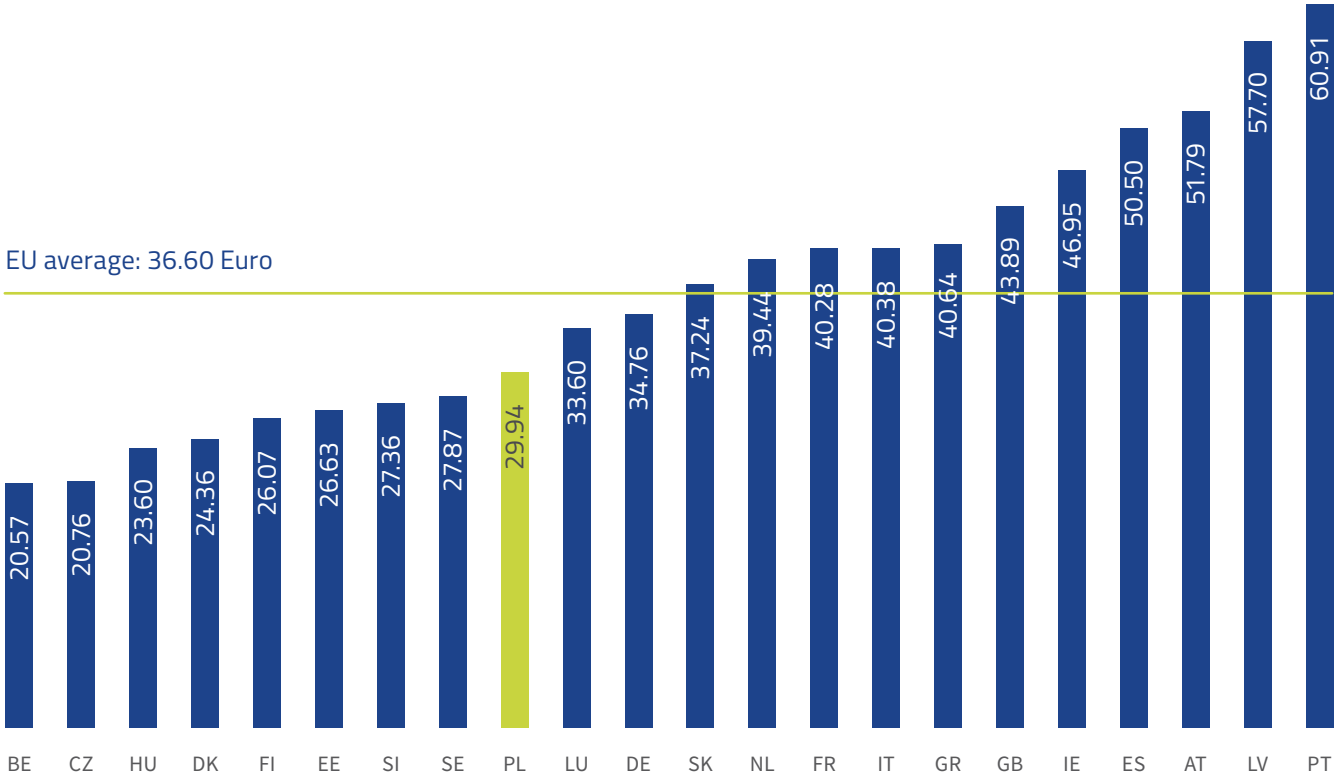
[7] Database developed by the analytic company Strategy Analytics

The price benchmark was developed on the basis of the OECD Fixed Voice Price Benchmarking[7] database. The database is a collection of fixed-line telephony service offers of the largest operators in Europe. For comparative purposes, the basket value for a moderately active user was used.

In 2017, the average price in Europe for the use of a fixed-line phone was EUR 36.60. The lowest costs were borne by users in Belgium, where fees for the service were at the level of EUR 20.57. The inhabitants of Portugal, on the other hand, paid the highest prices. The average price for a fixed-line phone was EUR 60.91. The costs borne by Poles in the analysed period were lower than the EU average by nearly EUR 7, amounting to EUR 29.94.

Chart 50

Monthly basket values for a moderately active user in selected EU countries (EUR, including VAT)



Source: UKE, based on Fixed Voice Price Benchmarking, Strategy Analytics

Note: database as of May 2017. For Poland, the Orange "Plan na Każdy Dzień" was chosen.
The value of the basket consists of installation and subscription fees as well as the cost of calls

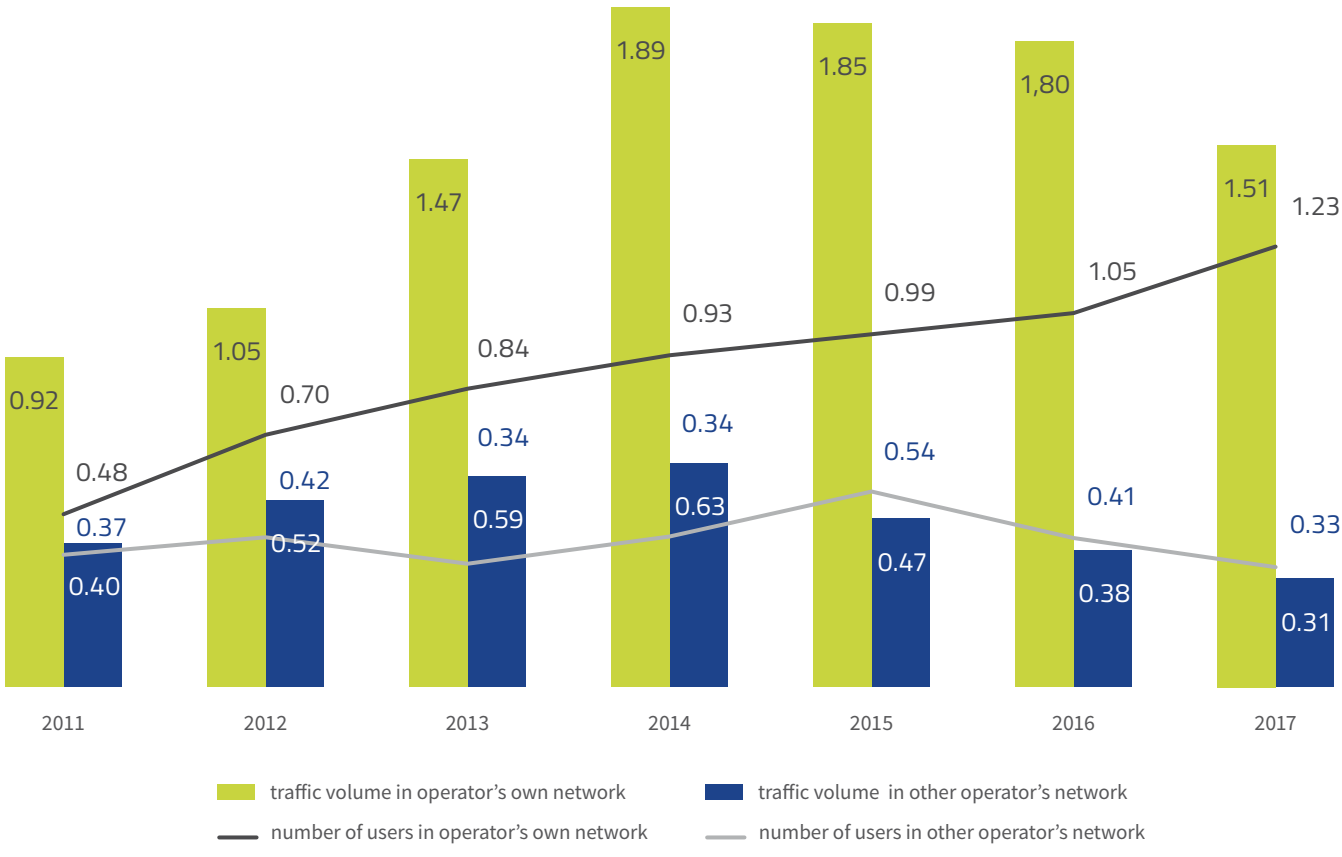
4.8. VoIP telephony

In recent years, the VoIP telephony market has witnessed a growing trend as for the number of users of the service provided within the operator's own network and a declining trend in relation to customers using the service through another operator's network. In 2017, 1.23 million users were connected to the VoIP service through the undertaking's own network, which was an increase by 17.8% compared to 2016. In the same period, 333,000 customers had the service based on the network of another operator, which was a decrease of 19.3% compared to 2016.

Similarly to the preceding year, the duration of calls decreased significantly, both for the services provided in an undertaking's own network and those provided through another undertaking's network. For the former, the decrease was by 15.9%, from 1.8 billion minutes in 2016 to 1.5 billion minutes at the end of 2017, whereas for the latter the decrease was higher and amounted to 20.2% – from 383 million minutes to 306 million minutes.

Chart 51

Number of users (million) and traffic volume of VoIP services (billion minutes)



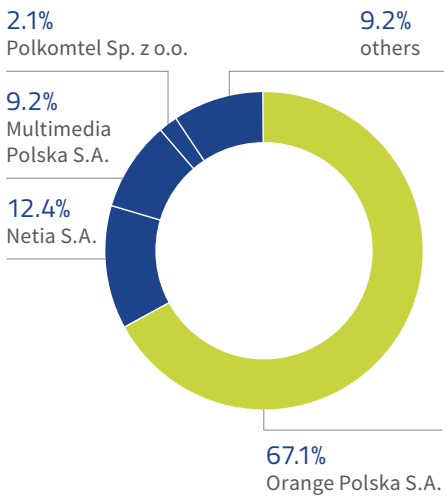
Source: UKE

The leading position in the market of the VoIP service provided using operator's own IP access network did not change in relation to the preceding year. Orange remained the leader, with a 67.1% share in the number of users in 2017 compared to 60.1% in 2016. Netia (12.4%) ranked second, and Multimedia Polska third (9.2%).

As for providing services through the network of another undertaking, easyCALL.pl had the greatest number of customers. 45.5% of users used the services of this operator. Netia's share did not change significantly compared to 2016 and amounted to 22%, which gave the operator the second position in terms of shares in the number of customers. Just over 10% of the market was in the hands of Aiton Caldwell, which made the undertaking move up to the third position.

Chart 52

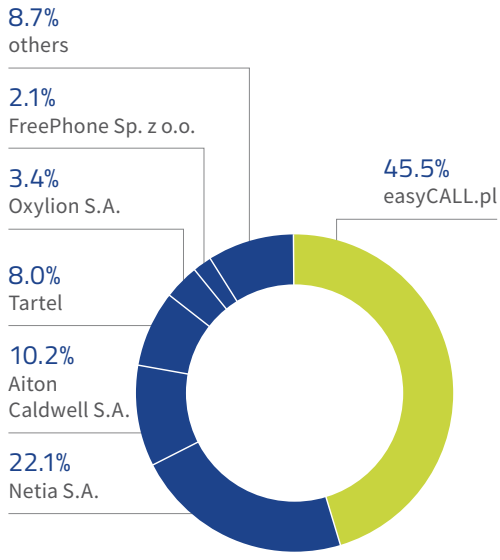
Operators' shares in terms of the number of users of services provided using operator's own network in 2017



Source: UKE, based on operators' data

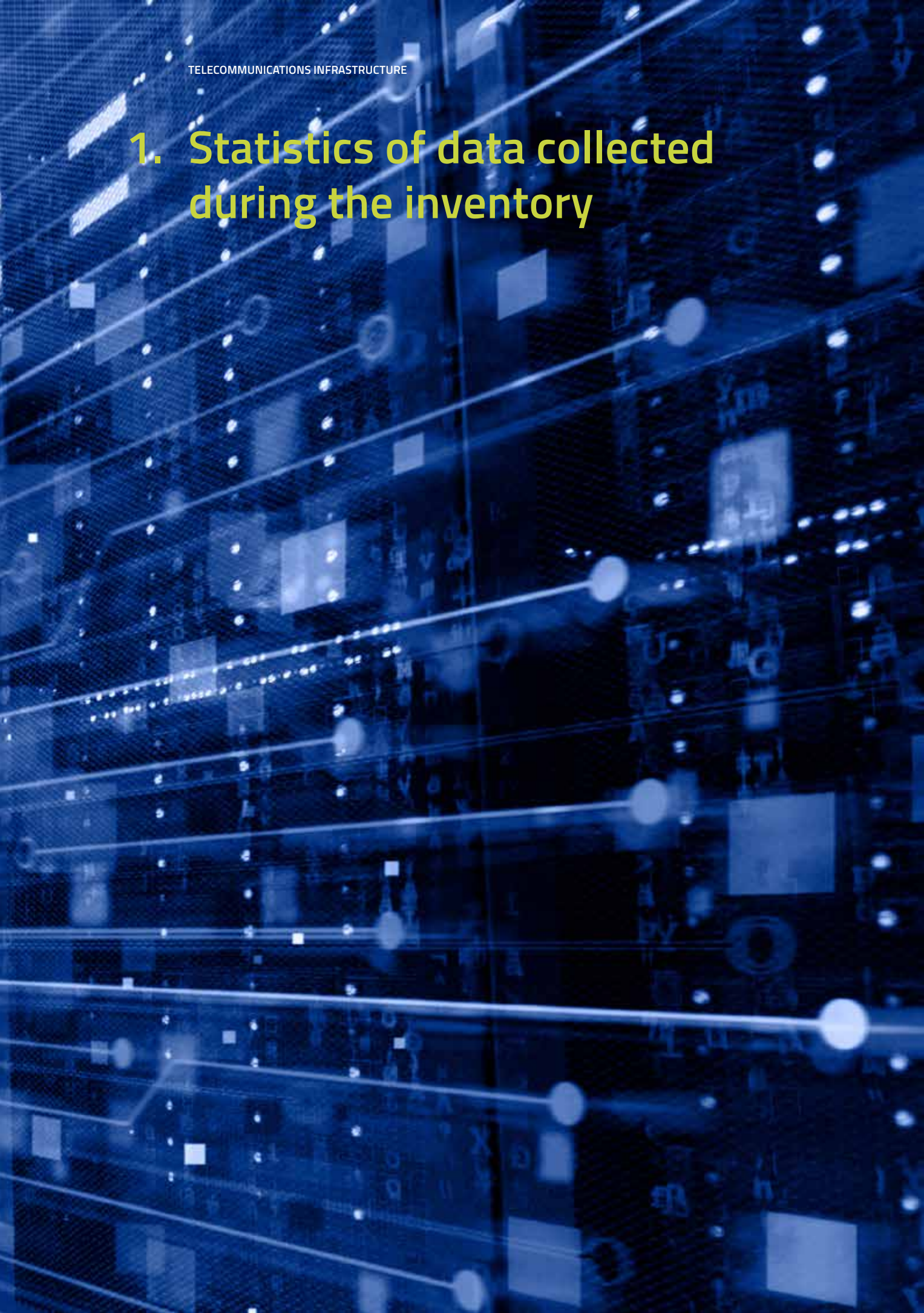
Chart 53

Operators' shares in terms of the number of users of services provided using other operator's access network in 2017



Source: UKE, based on operators' data

1. Statistics of data collected during the inventory

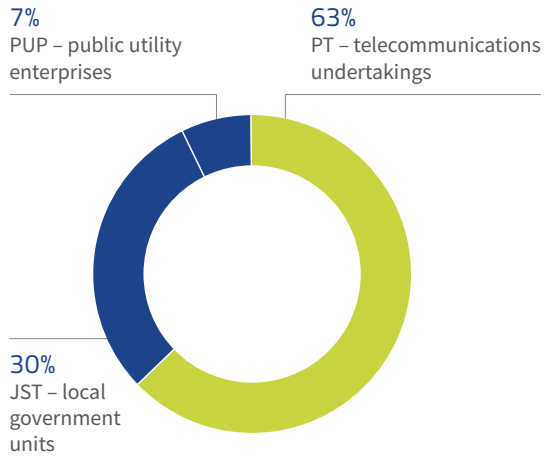


In total, 9,360 entities were included in the SIIS system (by 176 fewer than in the preceding year). The difference in the number of entities that were included in the SIIS in the previous inventory results, among others, from:

- removing 51 undertakings from the Register of Telecommunications Undertakings following their deletion from the CEIDG and 26 undertakings following their deletion from the National Court Register,
- making entries and removals from the Register at the request of telecommunications undertakings,
- removal of accounts of certain entities recorded in the database as public utility enterprises that had provided statements on not meeting the requirements set out in Article 2 (3) of the Act on supporting the development of telecommunications services and networks.

Chart 1

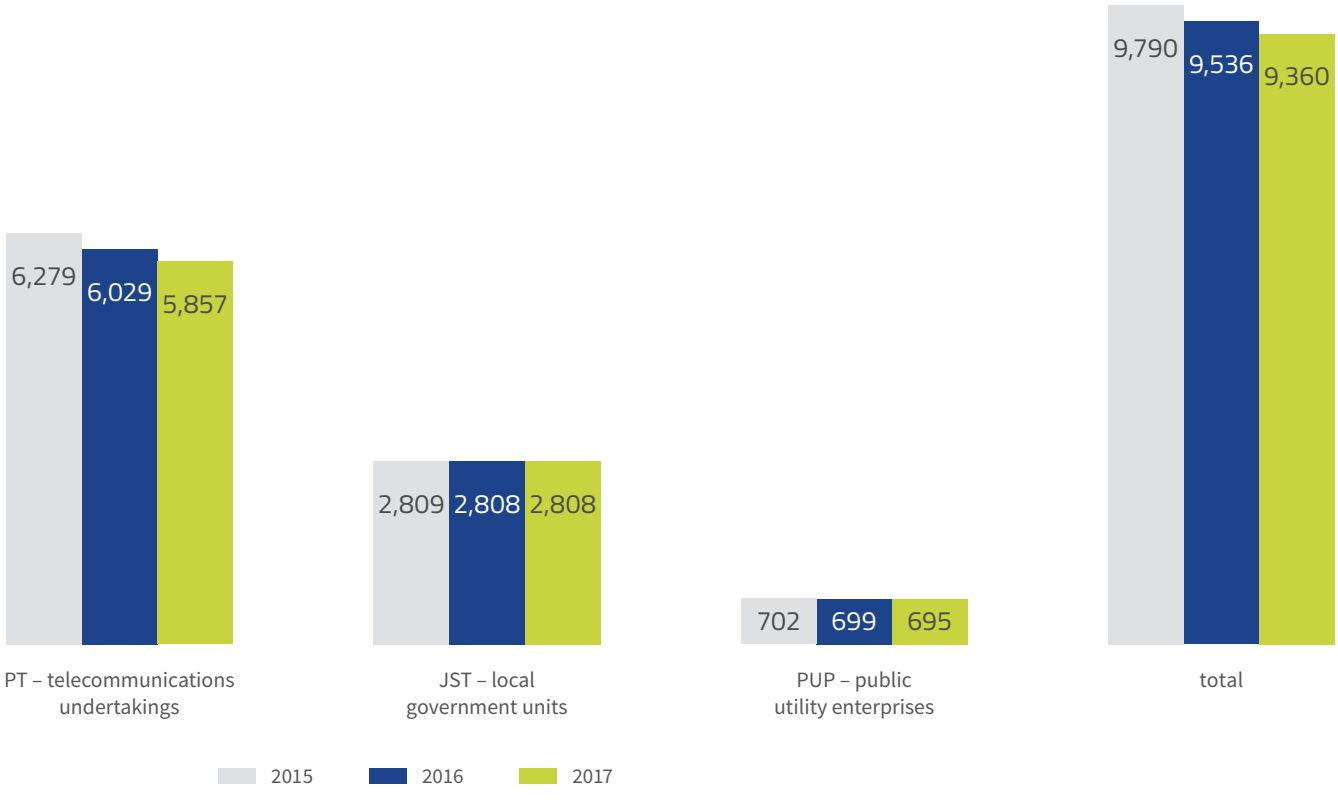
Types of entities in the SIIS in 2017



Source: UKE

Chart 2

Number of entities in SIIS during the inventories for 2015-2017

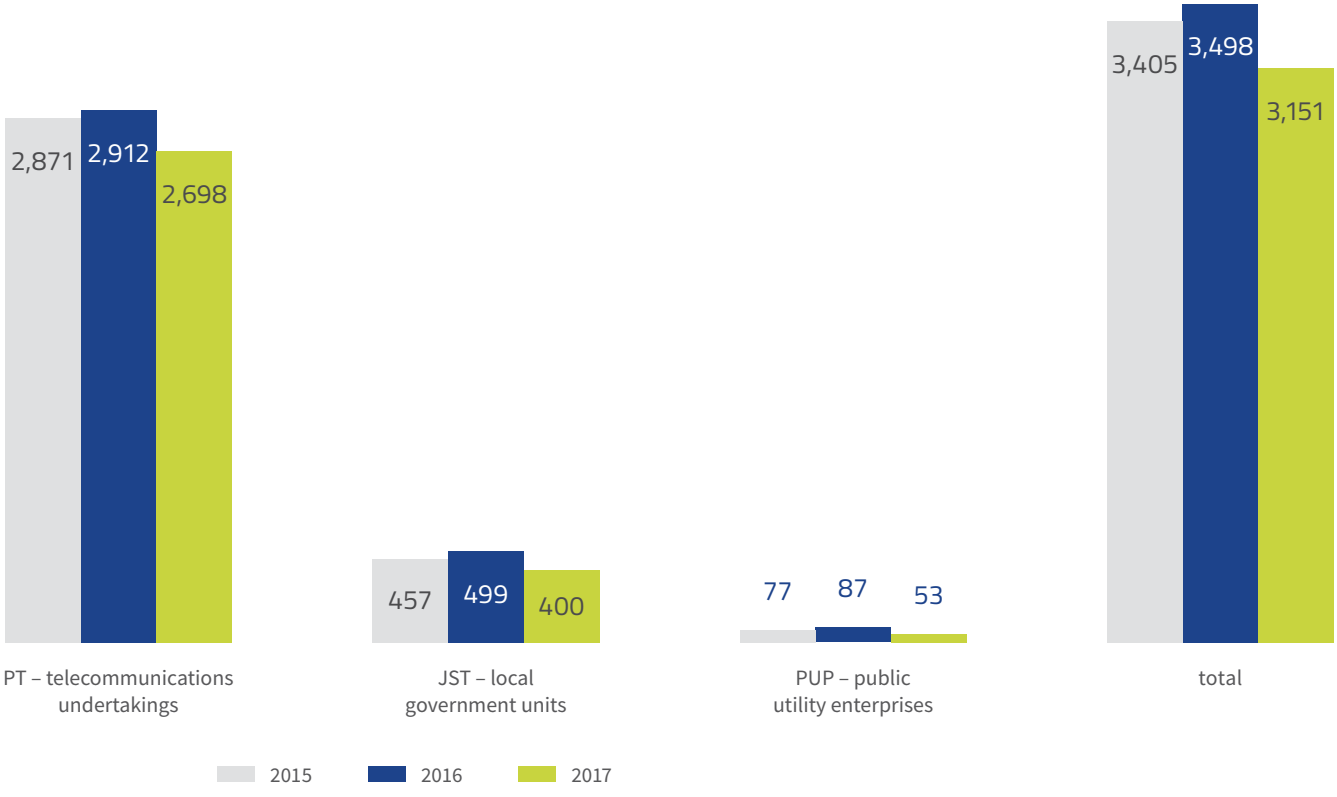


Source: UKE

Data for 2017 was provided to the SIIS system by 3,151 entities. The decrease in the number of entities whose data was entered into the system as part of the inventory for 2017 was recorded in all categories of entities.

Chart 3

Number of entities that provided data as part of the inventories for 2015-2017

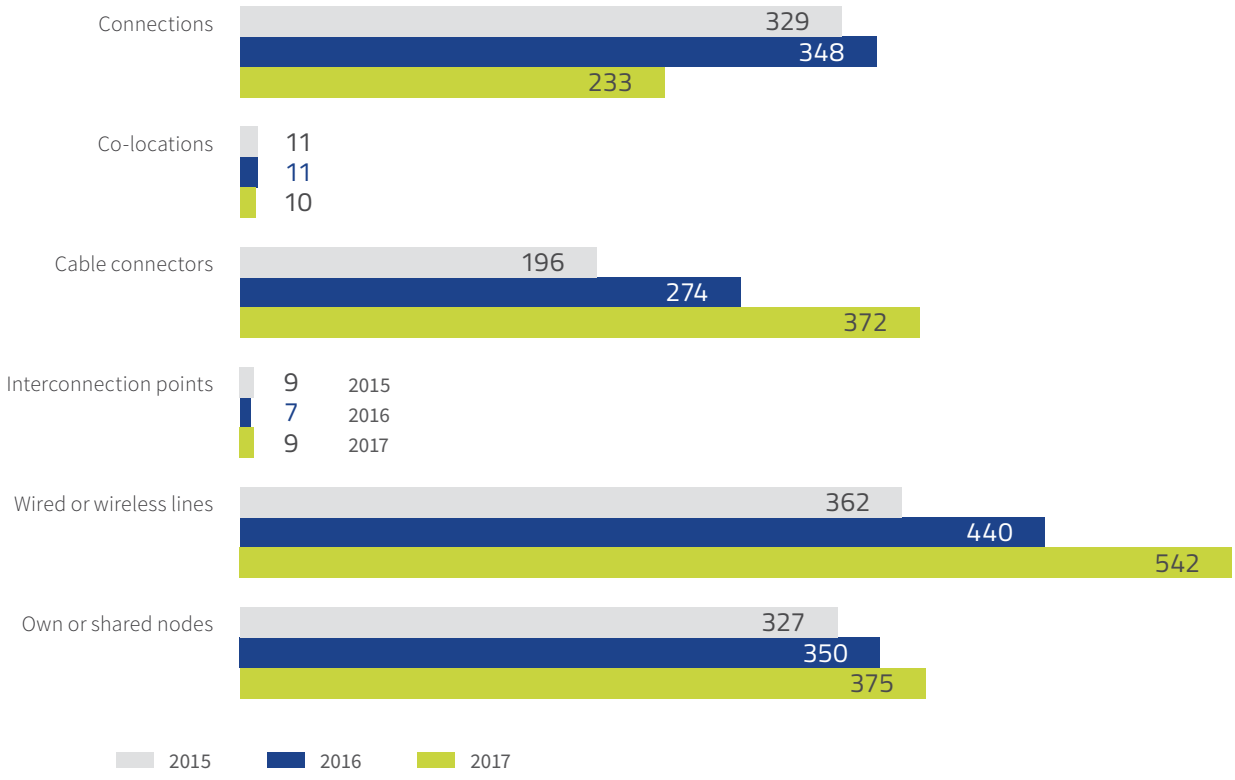


Source: UKE

Despite the decrease in the number of data contributors, there was an overall increase in the number of data loaded to SIIS in most categories of infrastructure elements, from several percent up to 18% of the number of lines and 26% of the number of cable connectors.

Chart 4

Number of infrastructure elements (in thousands) entered into SIIS

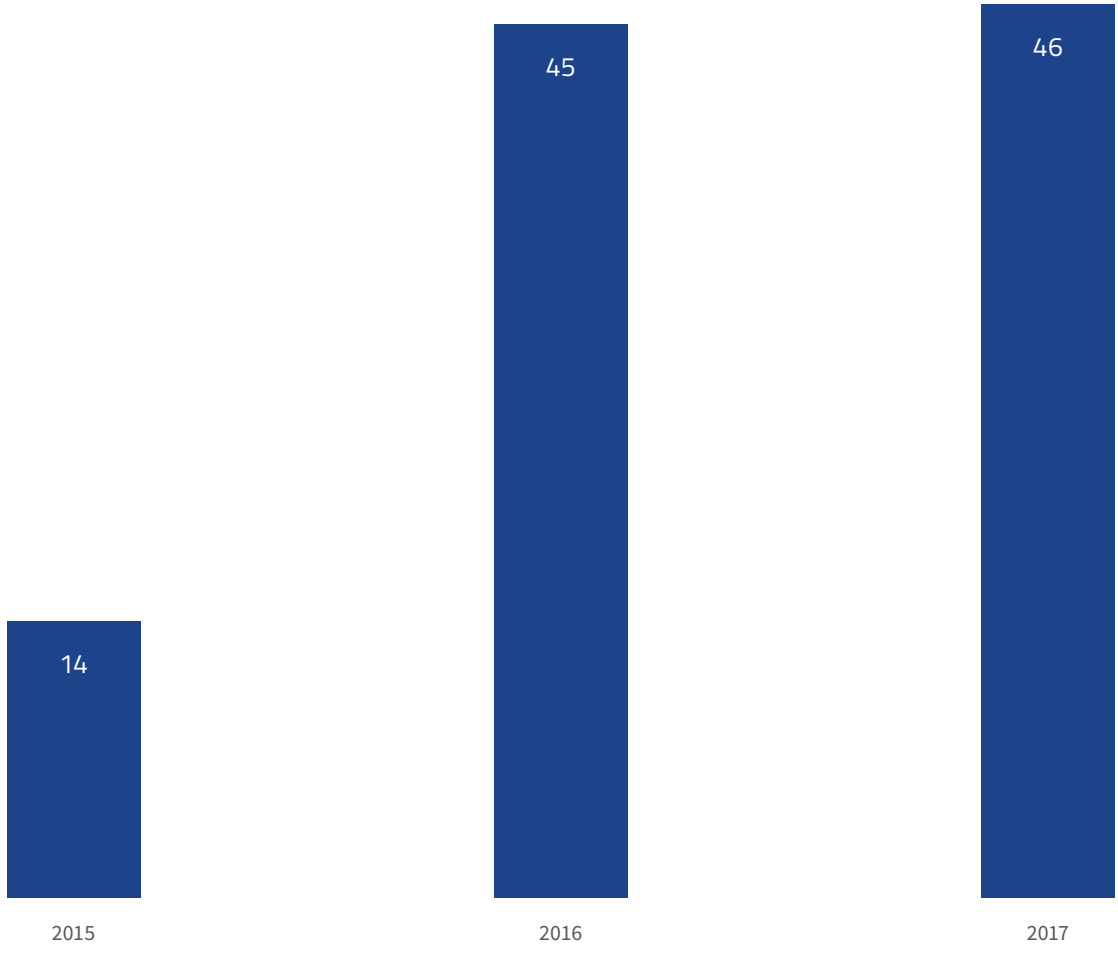


Source: UKE

The number of network termination points (the majority of which are mobile network terminals) provided during this year's inventory increased from 45 to 46 million. A large number of buildings within the network coverage – by several times exceeding the number of buildings in Poland – results from the fact that each mobile operator declared almost all buildings within its mobile network.

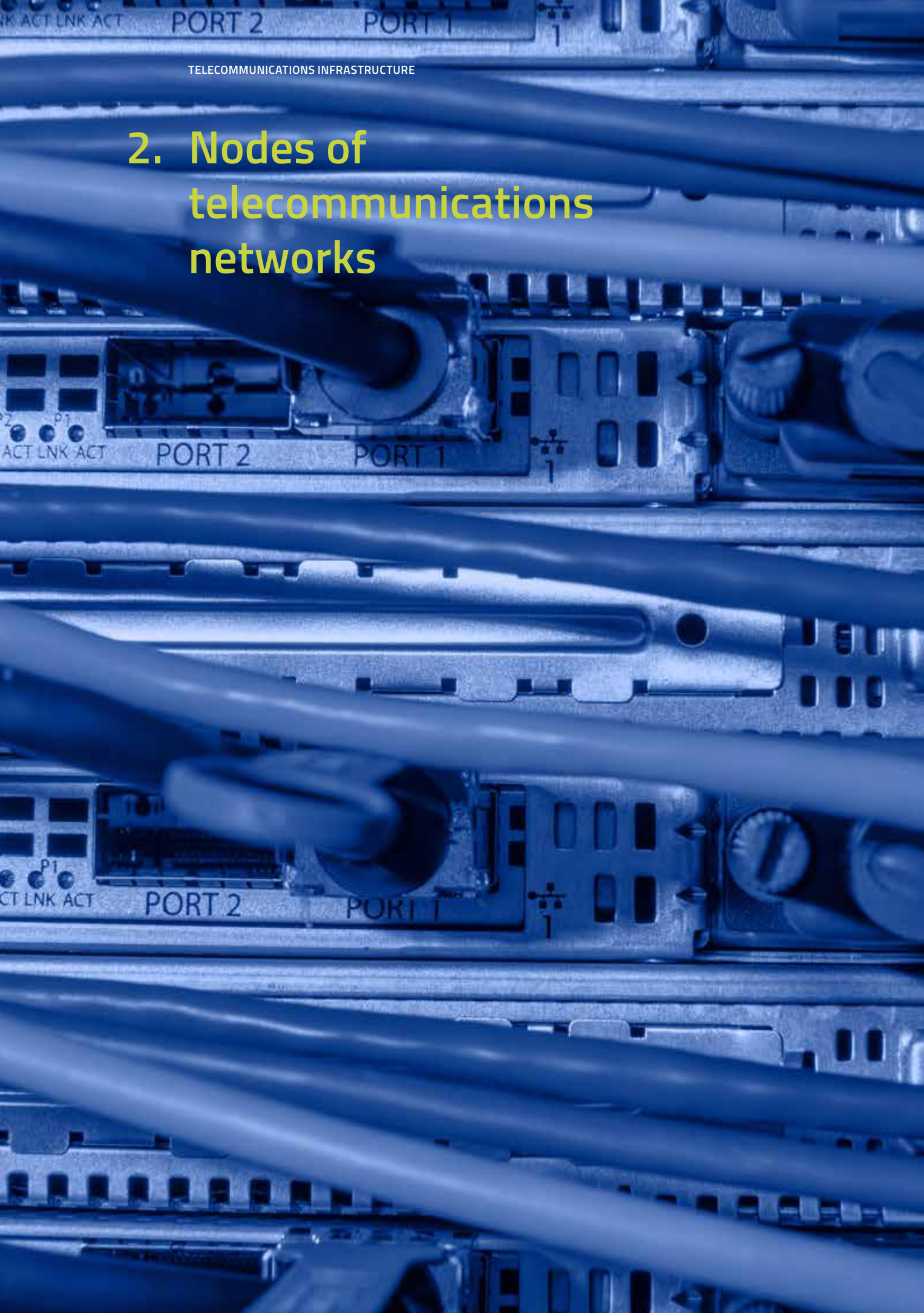
Chart 5

Number of network termination points (in millions) entered into SIIS



Source: UKE

2. Nodes of telecommunications networks



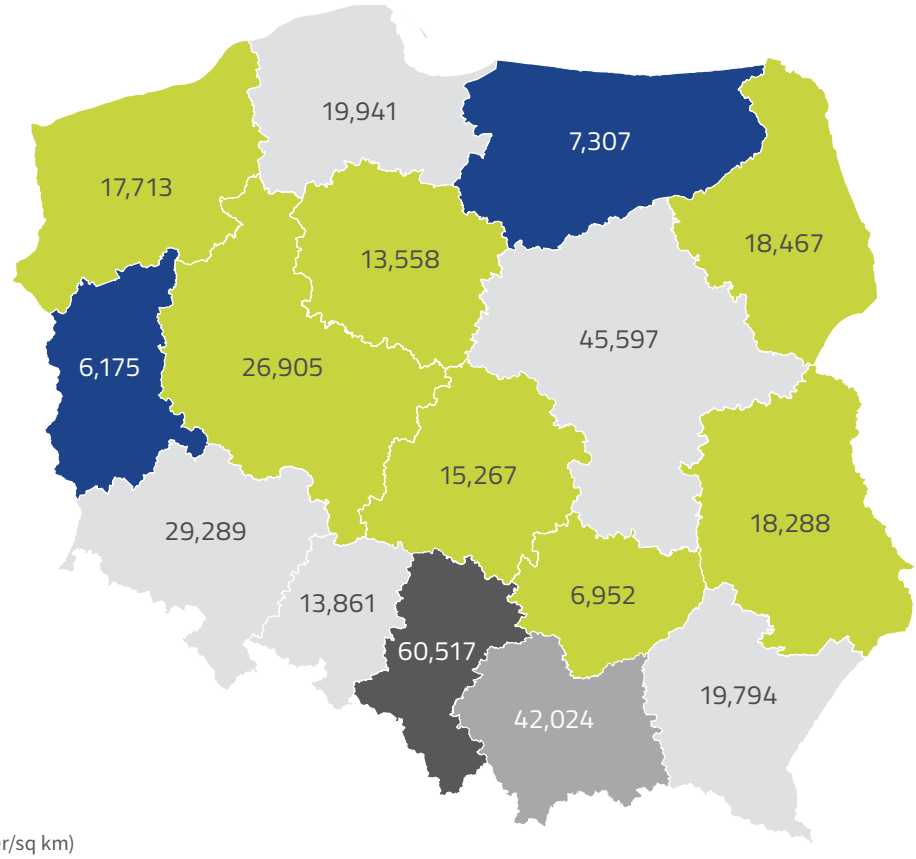
2.1. Own nodes

As part of the inventory of the telecommunications infrastructure for 2017, obliged entities reported 361,655 own nodes (without virtual nodes), which is an increase by over 30,000 compared to the preceding year's data.

Map 1 shows the density and number of own nodes in individual regions. The Silesia region is distinguished here as the greatest number of nodes is located there with the relatively small area of the region – such a situation is a result of a high level of urbanization of this area. The Lesser Poland Region is also characterized by relatively high density of the nodes (almost 3 nodes per km^2). In the area of the two above-mentioned regions, there are almost 30% of all domestic nodes. An average density of nodes is characteristic of the following regions: Opole, Lower Silesia, Masovia, Subcarpathia and Pomerania. At the other end of the list you can find Warmia-Masuria and Lubusz regions where there is one telecommunications node for each 3 km^2.

Map 1

Owned nodes in regions

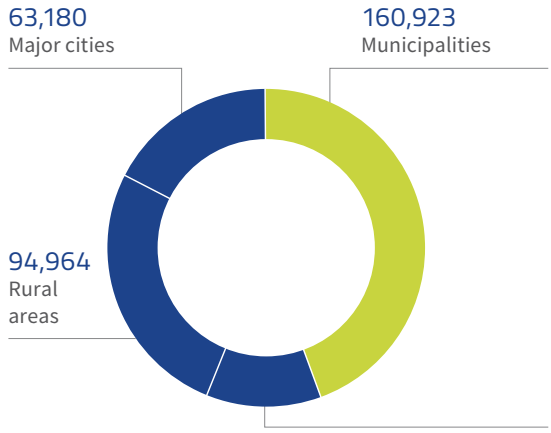


Source: UKE

More than half of the nodes are located in cities with a population of over 50,000. Every fourth node is located in a rural area.

Chart 6

Number of owned nodes



Source: UKE

Table 1

Number of nodes in localities with different size categories

Size of the locality	Number of nodes	Percentage of the number of nodes in the total number of nodes
above 100,000	153,470	42.44
50,001 – 100,000	29,000	8.02
20,001 – 50,000	41,472	11.47
5,001 – 20,000	37,013	10.23
1,001 – 5,000	41,939	11.60
501 – 1,000	21,788	6.02
101 – 500	31,155	8.61
up to 100 residents	5,818	1.61

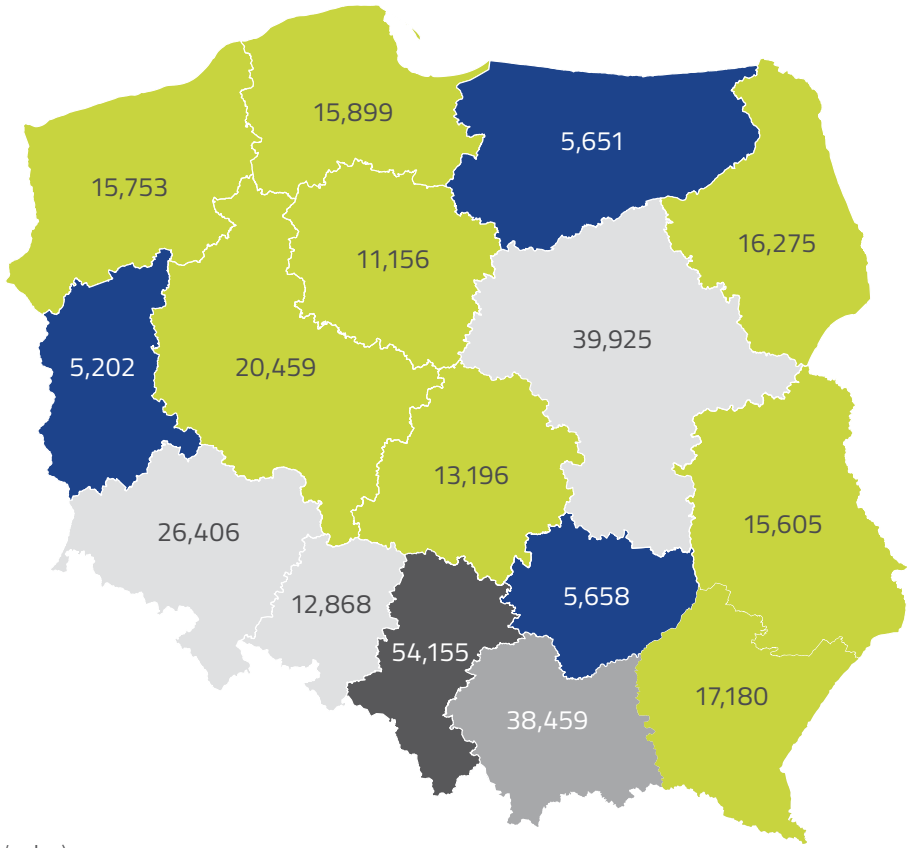
Source: UKE

2.2. Access nodes

313,847 access nodes were reported in the last inventory. As in the case of operators' own nodes, the highest density of access nodes is characteristic of the Silesia and Lesser Poland regions.

Map 2

Access nodes in regions



nodes density (number/sq km)

0.23 – 0.50 0.51 – 1.00 1.01 – 1.50 1.51 – 3.50 3.51 – 4.39

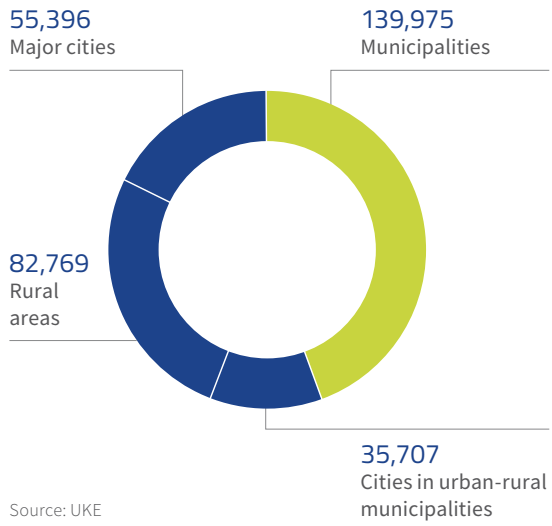
Source: UKE

The comparison of the territorial distribution of access nodes with the values in chart 6 allows the finding that 87% of operators' own nodes located in rural areas are access nodes. The share of such nodes increased by 4% compared to the data for 2016.

The similarity with respect to analogous data for operators' own nodes is also noticeable when comparing the percentage of access nodes located in localities of different sizes – more than half of the nodes are located in cities with a population of more than 50,000.

Chart 7

Number of access nodes



Source: UKE

Table 2

Number of access nodes in localities of various size categories

Size of the locality	Number of nodes	Percentage of the number of nodes in the total number of nodes
above 100,000	134,102	42.73
50,001 – 100,000	25,639	8.17
20,001 – 50,000	35,643	11.36
5,001 – 20,000	30,734	9.79
1,001 – 5,000	36,940	11.77
501 – 1,000	19,248	6.13
101 – 500	26,650	8.49
up to 100 residents	4,891	1.56

Source: UKE

Relatively fewest localities without access nodes are located in the Lesser Poland and Subcarpathia regions (less than 25%). These regions are also characterized by the largest number of localities with three or more operators (over 30%). Most localities without access nodes are located is in the Warmia-Mazuria (76%) and Podlaskie regions (75%). When comparing data for 2016 and 2017, it should be noted that as a result of market development and investments supported with public funds, the number of localities without access nodes decreased in almost all regions.

Table 3

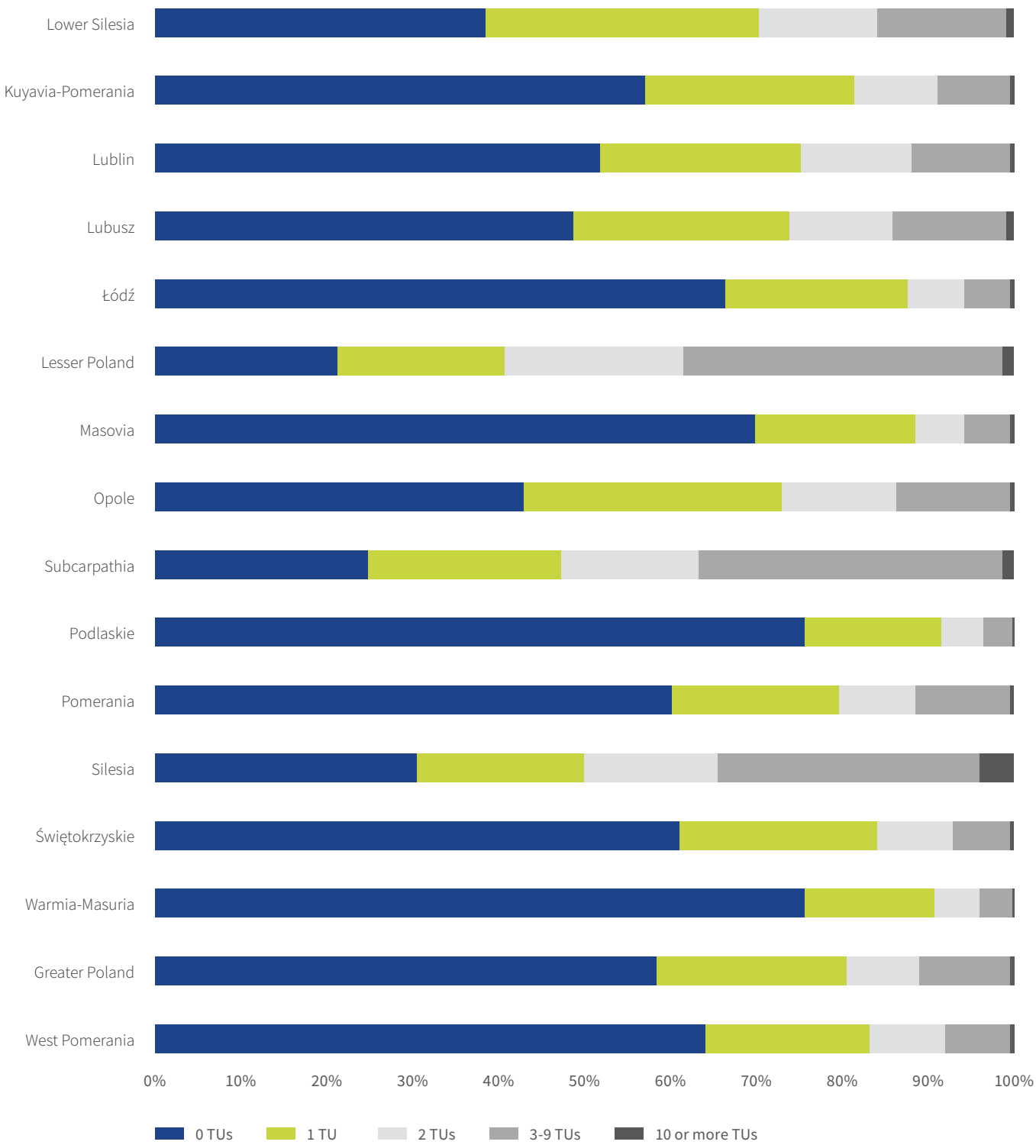
Number of localities in which entities reported their own telecommunications network access nodes, by region

Region	Total number of localities	0 TUs	1 TU	2 TUs	3-9 TUs	10 or more TUs
Lower Silesia	2,621	1,011	830	366	382	32
Kuyavia-Pomerania	3,632	2,070	887	355	297	23
Lublin	4,089	2,105	966	523	478	17
Lubusz	1,335	651	337	157	178	12
Łódź	5,048	3,353	1,059	338	274	24
Lesser Poland	2,012	424	390	421	743	34
Masovia	8,616	6,009	1,593	507	469	38
Opole	1,202	512	367	157	157	9
Subcarpathia	1,718	423	387	273	609	26
Podlaskie	3,799	2,868	617	165	138	11
Pomerania	2,918	1,755	566	261	315	21
Silesia	1,366	416	265	213	413	59
Świętokrzyskie	2,519	1,533	585	217	173	11
Warmia-Masuria	3,924	2,968	597	195	151	13
Greater Poland	5,570	3,251	1,223	483	579	34
West Pomerania	3,079	1,970	591	269	236	13

Source: UKE

Chart 8

Localities in which entities reported their own telecommunications network access nodes, by region



Source: UKE

Analysis of the data on the number of towns by size category in which operators reported presence of their own access nodes allows to conclude that in all localities with population of at least 5,000 there are nodes of at least 3 entities.

Nodes of at least 10 entities are located in all medium and large cities. What is natural, most localities without access nodes are small and very small – up to 500 residents.

Table 4

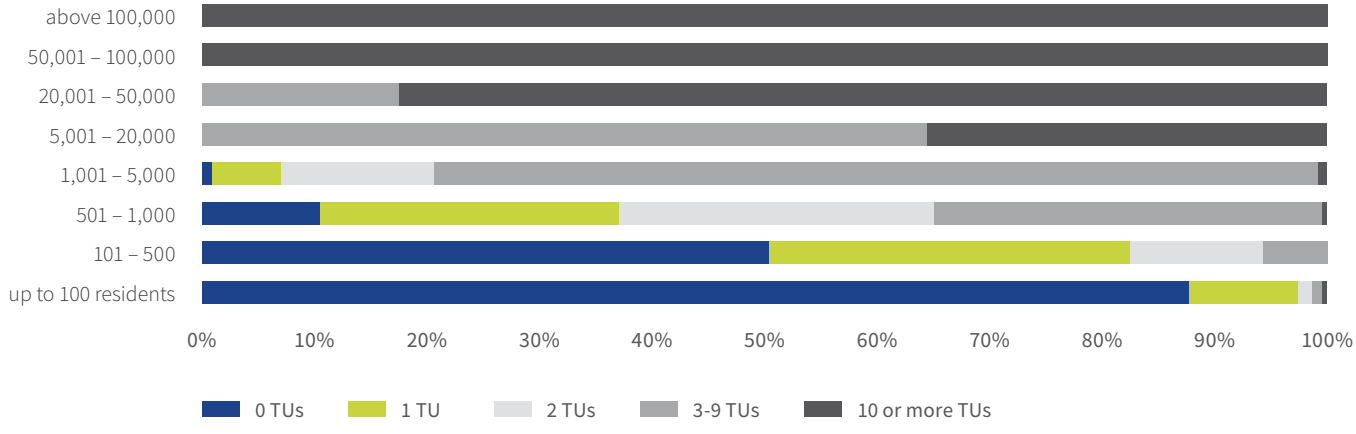
Number of localities in which entities reported their own telecommunications network access nodes, by locality size

Size of locality	Total number of localities	0 TUs	1 TU	2 TUs	3-9 TUs	10 or more TUs
above 100,000	39	0	0	0	0	39
50,001 – 100,000	48	0	0	0	0	48
20,001 – 50,000	135	0	0	0	24	111
5,001 – 20,000	423	0	0	0	272	151
1,001 – 5,000	2,832	32	168	389	2,217	26
501 – 1,000	4,327	459	1,152	1,213	1,502	1
101 – 500	24,919	12,576	7,961	2,977	1,405	0
up to 100 residents	20,725	18,252	1,979	321	172	1

Źródło: UKE

Chart 9

Localities in which entities reported their own telecommunications network access nodes, by locality size



Source: UKE

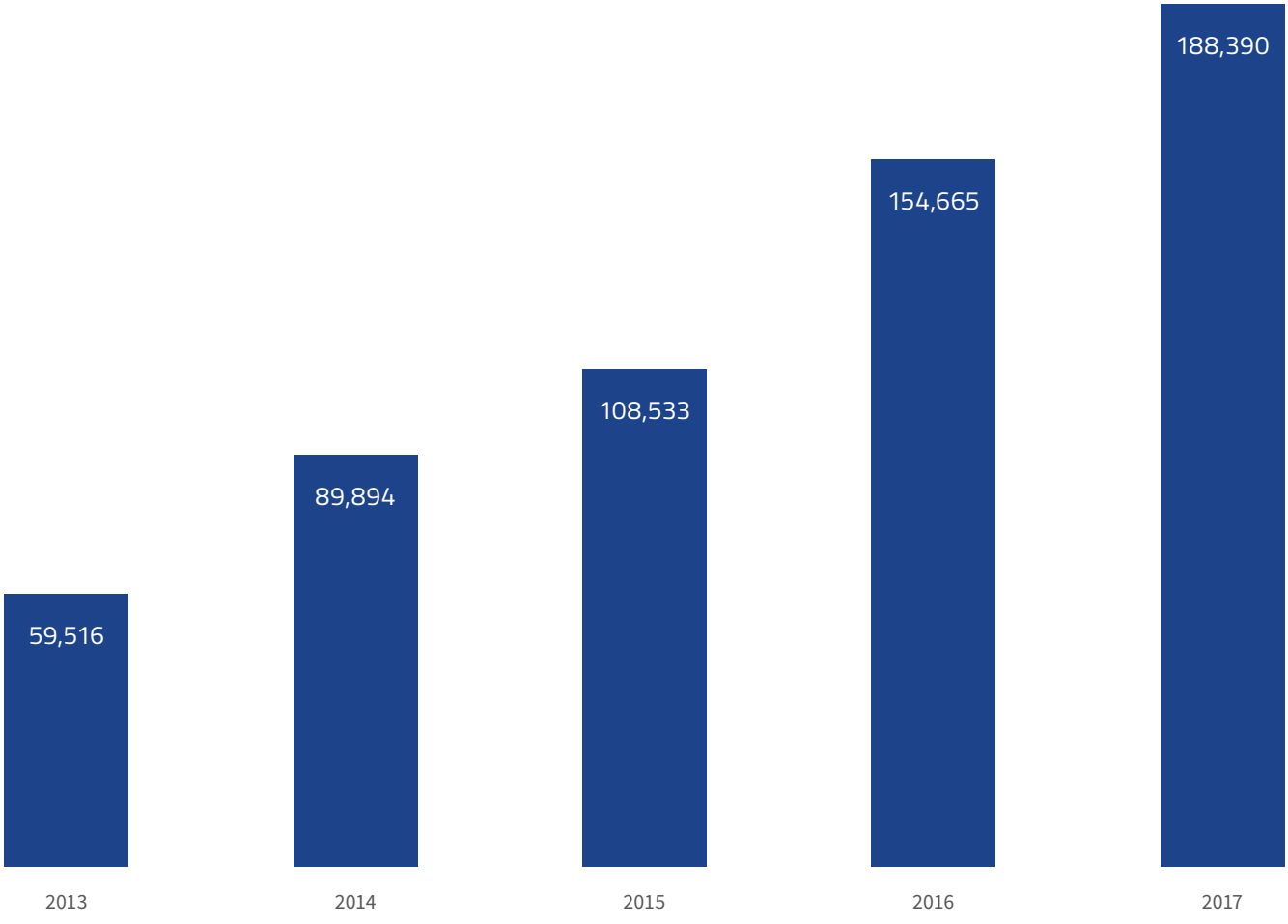
2.3. Fibre nodes

Data inventory for 2017 reported 188,390 fibre optic nodes. The number of such nodes increased by almost 34,000, compared to 2016 and over three times compared to 2013. The largest share, as much as 72%, of the nodes with fibre interfaces, is located in the Podlaskie region. On the other hand, only 26% of the nodes in the Opole region are nodes with fibre interfaces.

In Poland, on average, every second node is equipped with fibre interfaces. The largest share of fibre nodes is characteristic of localities with population of more than 20,000 up to 50,000. On average, the lowest number of such nodes is recorded in very small localities – up to 100 residents.

Chart 10

Number of fibre nodes in individual years



Source: UKE

Table 5

Number of nodes in individual regions by technology

Region	Number of nodes	Number of fibre nodes	Number of cable nodes	Number of radio nodes
Lower Silesia	29,289	14,937	20,560	7,190
Kuyavia-Pomerania	13,558	6,096	9,764	4,491
Lublin	18,288	10,174	7,519	6,511
Lubusz	6,175	2,741	3,992	2,237
Łódź	15,267	7,972	8,976	5,163
Lesser Poland	42,024	22,010	20,909	11,086
Masovia	45,597	29,585	28,538	8,198
Opole	13,861	3,613	11,944	2,088
Subcarpathia	19,794	9,128	8,195	8,482
Podlaskie	18,467	13,323	9,366	2,820
Pomerania	19,941	10,404	13,101	5,805
Silesia	60,517	32,577	34,649	10,414
Świętokrzyskie	6,952	3,362	3,523	2,806
Warmia-Masuria	7,307	3,517	5,075	2,567
Greater Poland	26,905	12,048	16,175	8,471
West Pomerania	17,713	6,903	13,604	4,421

Source: UKE

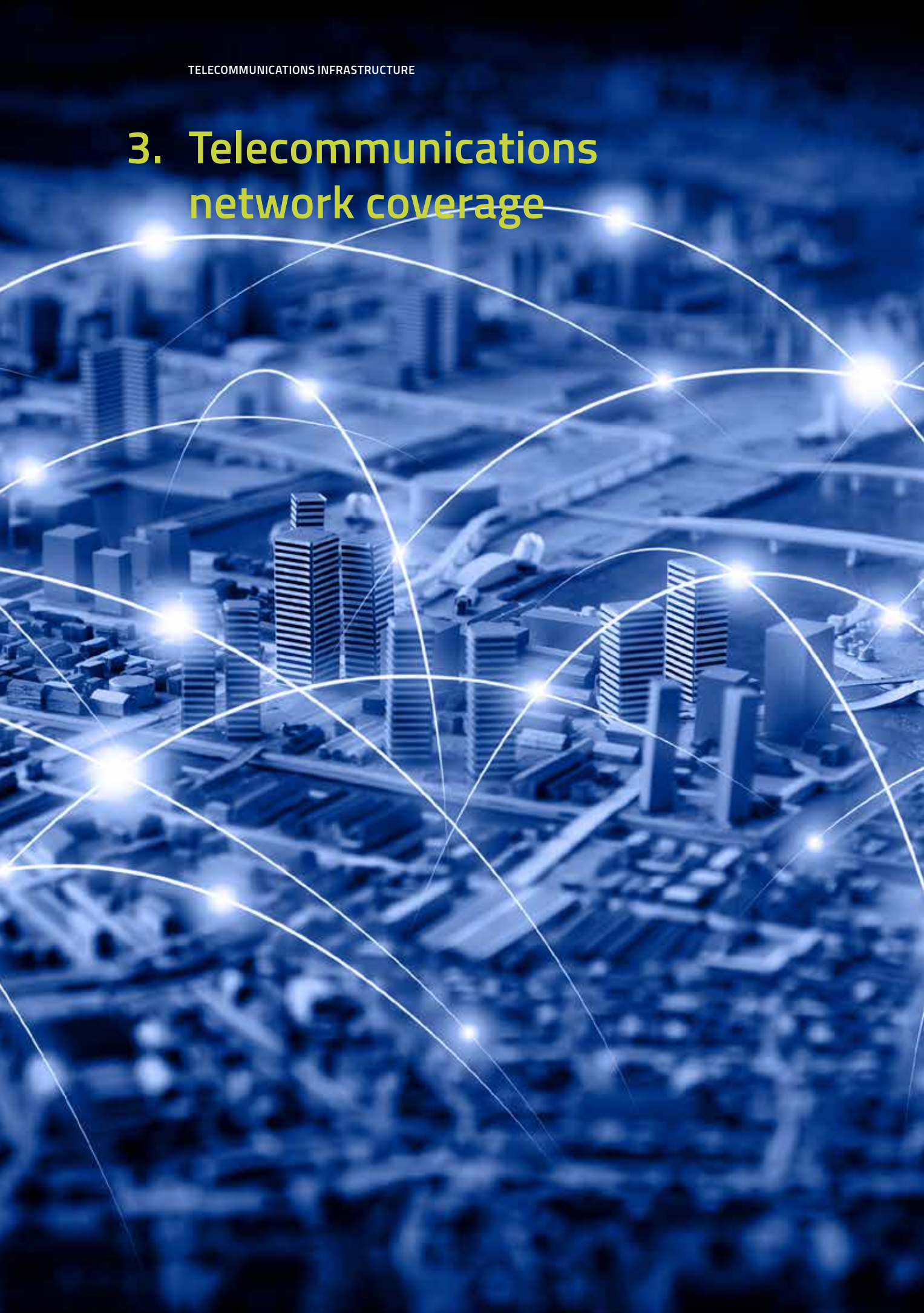
Table 6

Number of nodes in localities of different size categories, by technology

Size of locality	Number of nodes	Number of fibre nodes	Number of wired nodes	Number of radio nodes
above 100,000	153,470	82,173	110,252	18,567
50,001 – 100,000	29,000	15,799	19,207	4,281
20,001 – 50,000	41,472	24,787	23,118	7,532
5,001 – 20,000	37,013	19,313	21,544	10,457
1,001 – 5,000	41,939	22,130	17,012	17,748
501 – 1,000	21,788	11,195	8,148	10,281
101 – 500	31,155	11,114	14,119	19,877
up to 100 residents	5,818	1,879	2,490	4,007

Source: UKE

3. Telecommunications network coverage



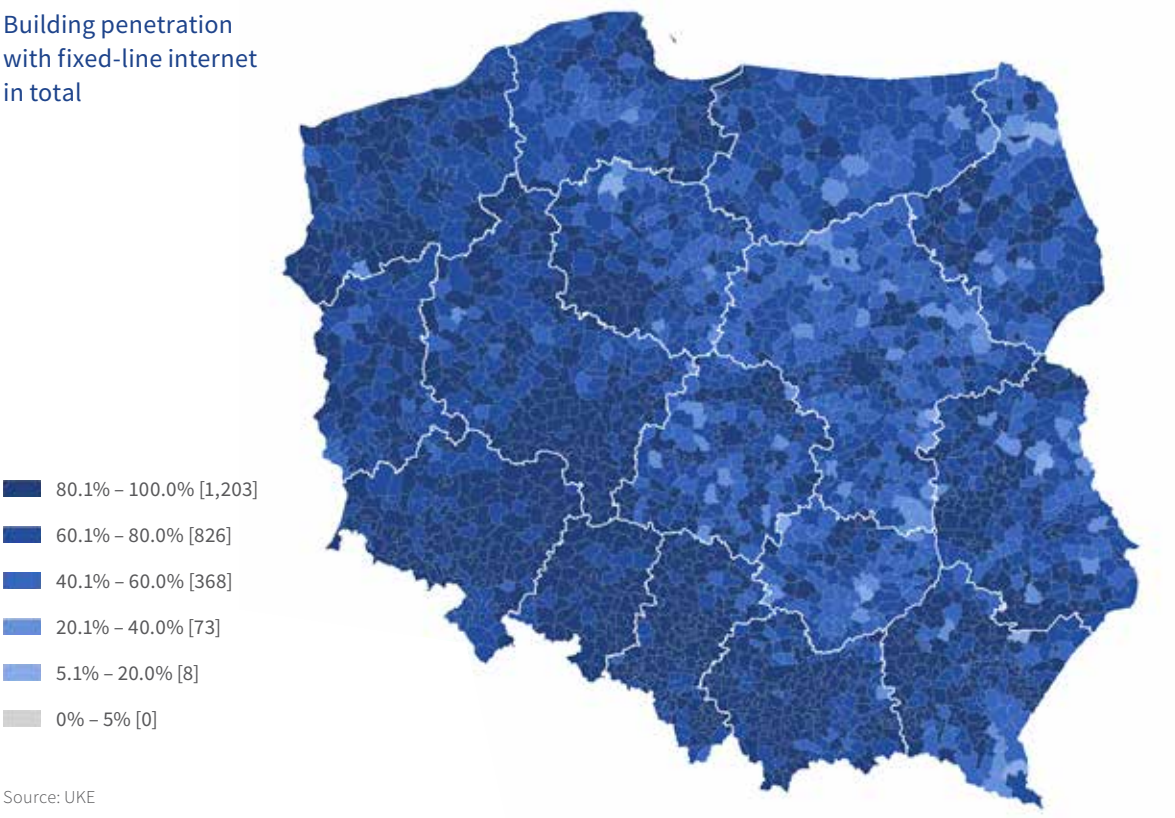
3.1. Penetration of wired connections or wireless terminals

In order to assess network availability, a building penetration indicator was used, understood as the ratio of the number of buildings within the network's reach (they are buildings where operators declare the possibility of providing services) to the number of all buildings in the analysed area.

The average building penetration with fixed-line internet coverage is approx. 82% and increased by 2 pp. compared to the preceding year. The following regions are characterized by the highest penetration (more than 85%): Opole (approx. 90%), Silesia, Lesser Poland, Lower Silesia and Greater Poland; the lowest penetration (less than 75%) was recorded in the following regions: Świętokrzyskie (approx. 68%), Warmia-Masuria, Masovia. The greatest increase in building penetration was recorded in Subcarpathia (8 pp.), while the lowest increase progression was observed in Łódź (less than 2 pp). In relation to data for the preceding year, it can be noted that the number of municipalities in the lowest categories of building penetration decreased, i.e. the municipalities in which more than half of the buildings have no potential access to the fixed-line internet service. The share of buildings with access to fixed-line internet in individual municipalities clearly varies geographically – it is higher in the western part of the country and in highly urbanized areas. A clear progress in increasing the accessibility of the fxed-line internet service is noticeable in Subcarpahia, where the differences between cities and rural areas had decreased, however in the southern, mountainous part of the region, the availability of services is not at the expected level.

Map 3

Building penetration with fixed-line internet in total



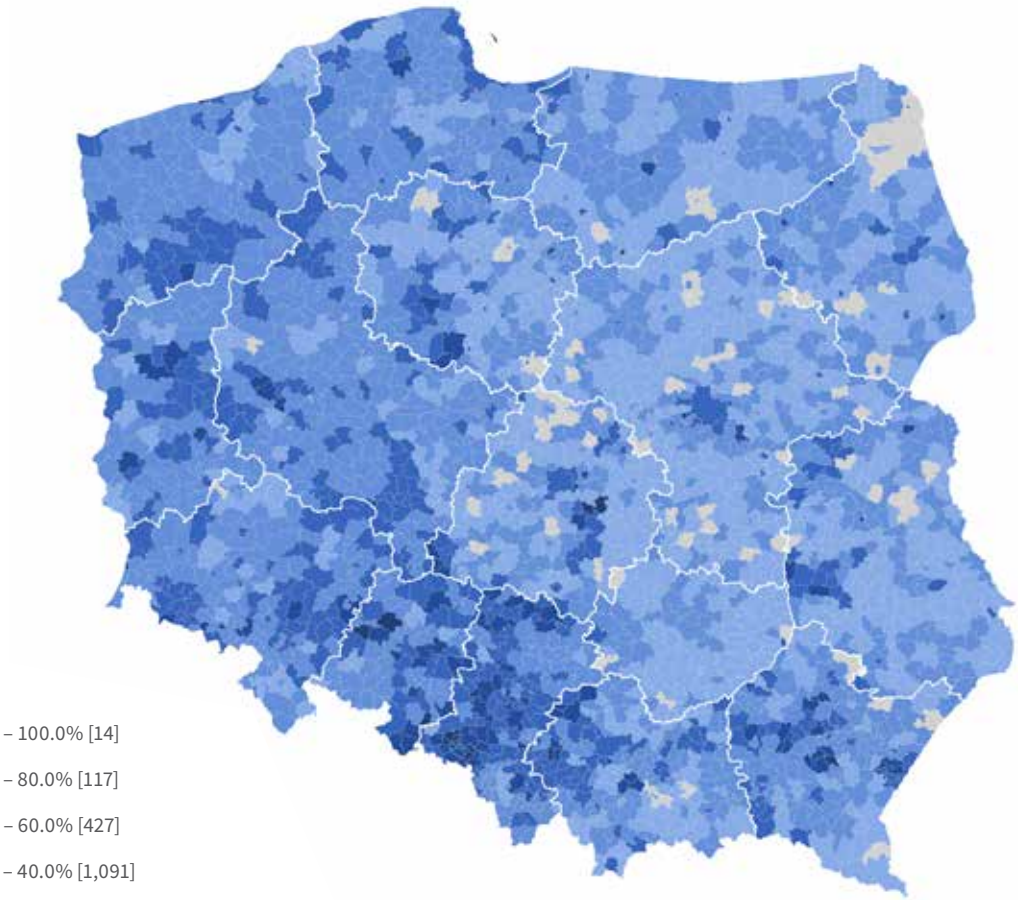
Source: UKE

The domestic average building penetration with access to fixed-line internet services of at least 30 Mb/s currently amounts to approx. 33% compared to 32% in 2016. The highest (more than 40%) was recorded in Silesia (more than 50%), Opole and Lower Silesia, and the lowest – in Świętokrzyskie (approx. 19%). Among the municipalities, the highest building penetration of this type (93.6%) is characteristic of the municipality of Będków in the poviat of Tomaszów (Łódź region).

The northern part of Podlaskie and individual municipalities in the regions of the central and eastern Poland are areas with extremely low (less than 5%) penetration with services; however, the number of such municipalities decreased compared to the preceding year. The lowest penetration, where no coverage of fixed-line internet of at least 30 Mb/s was reported, was recorded in the municipality of Szumowo in the poviat of Zambrów and in the municipality of Czarna in the poviat of Bieszczady.

Map 4

Building penetration with fixed-line internet of at least 30 Mb/s



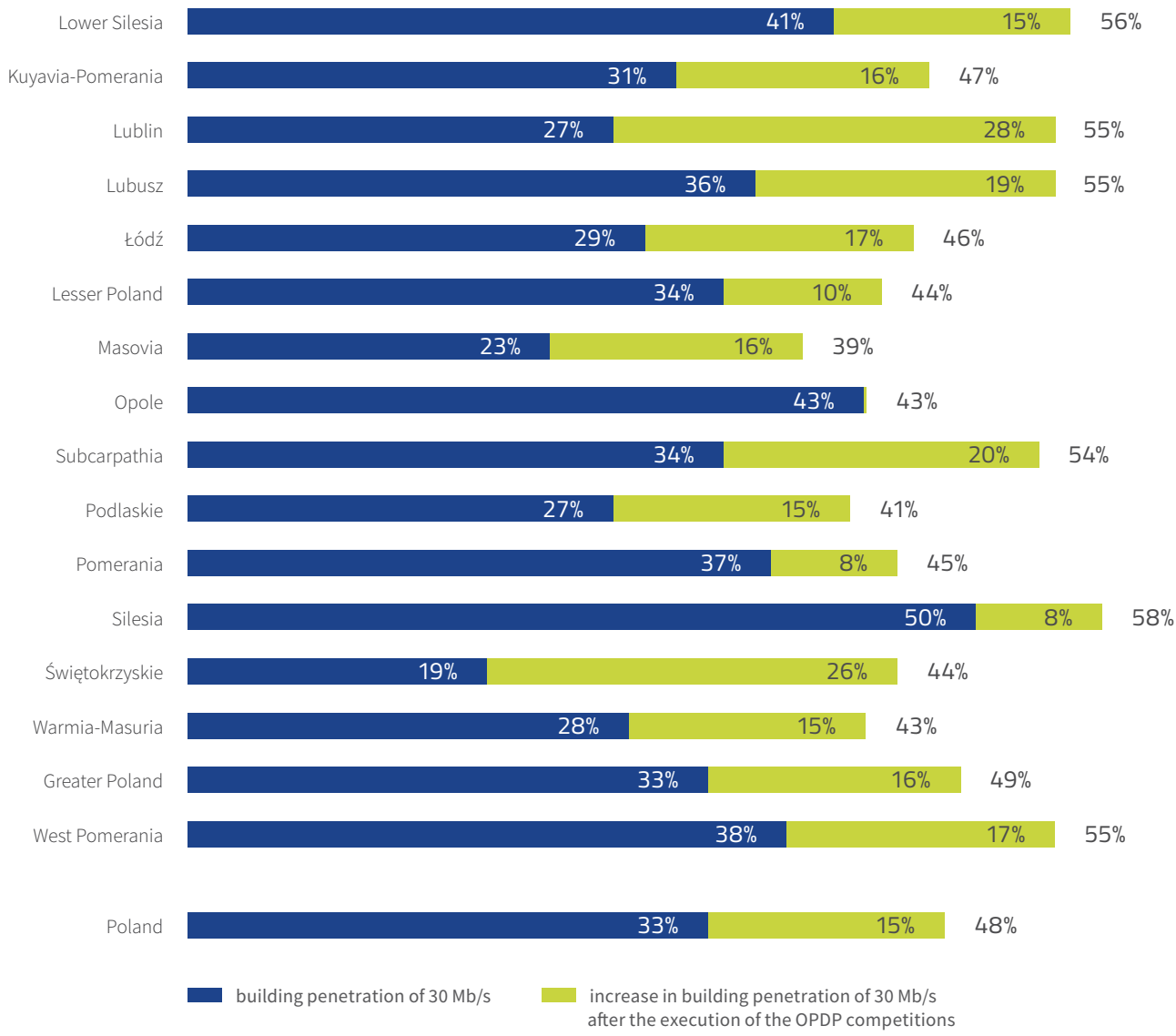
80.1% – 100.0% [14]
60.1% – 80.0% [117]
40.1% – 60.0% [427]
20.1% – 40.0% [1,091]
5.1% – 20.0% [758]
0% – 5% [70]

Source: UKE

Assuming the implementation of the minimum coverage for the third call for proposals under the Operational Programme Digital Poland and completion of investments from the two previous calls, the average building penetration with fixed-line internet coverage of at least 30 Mb/s should increase in Poland by 15 pp, reaching the level of 48%. The best results of the investment should be expected in Lublin and Świętokrzyskie regions (increase by more than 25 pp), while the worst should be expected in Opole region where no investments under the Programme are currently being implemented. After completion of all the investments, the average highest percentage of buildings covered with services of a capacity of at least 30 Mb/s at the level of over 55% will be characteristic of Silesia and Lower Silesia regions.

Chart 11

Building penetration with fixed-line internet of at least 30 Mb/s after the implementation of competitions within the OPDP

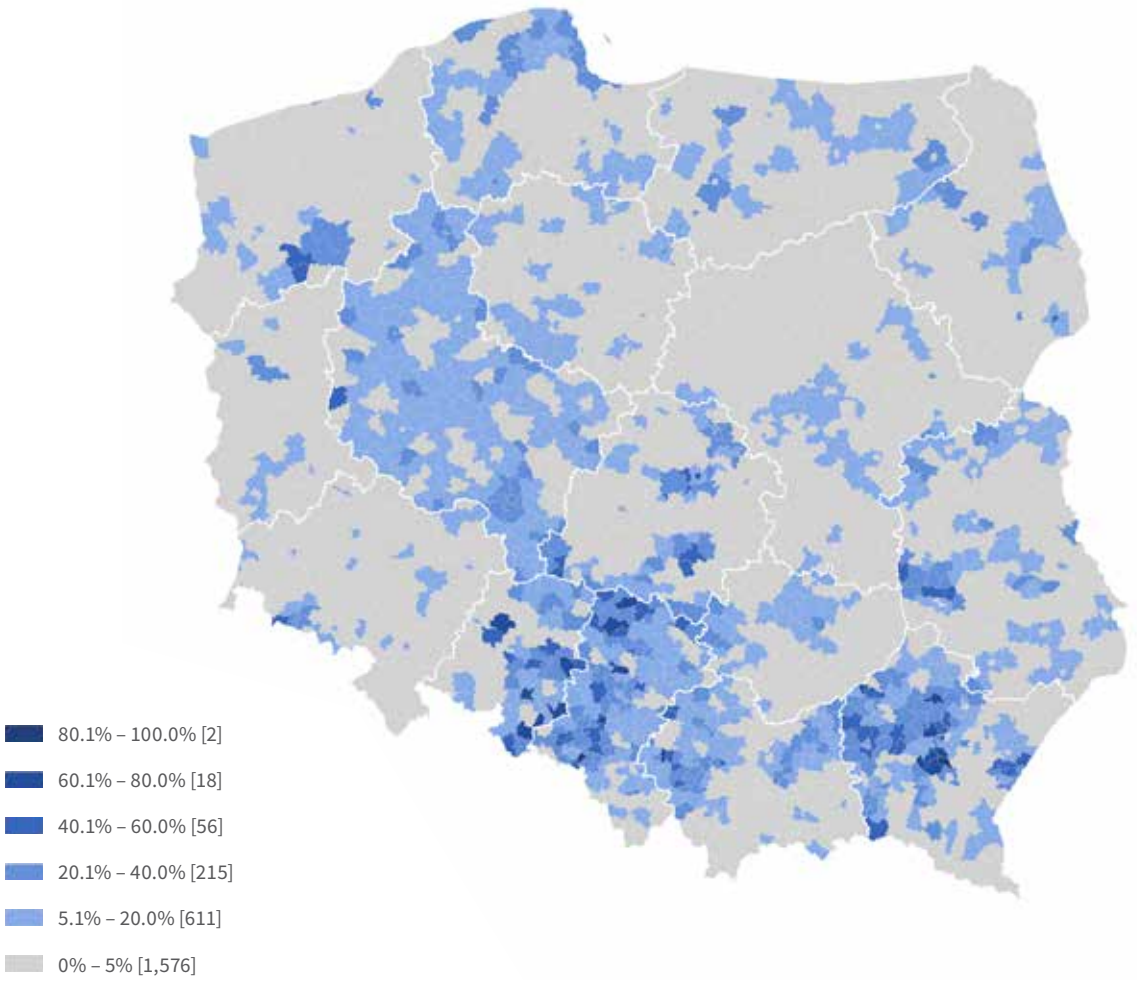


Source: UKE

Access to services with the highest speeds, at least 100 Mb/s, is currently provided for every tenth residential building in Poland – in 2016, it was every twelfth building. Until now, such access was mainly provided to the residents of multi-family buildings in large cities, but the availability of such services is systematically increasing also in rural areas. The highest percentage of buildings within coverage of internet of at least 100 Mb/s is characteristic of Subcarpathia, Opole and Silesia regions (more than 15%), while the worst situation is recorded in Lubusz, Masovia, Kuyavia-Pomerania and Świętokrzyskie regions, where access to fixed-line internet of at least 100 Mb/s is possible in less than every 20th residential building.

Map 5

Building penetration with fixed-line internet of at least 100 Mb/s



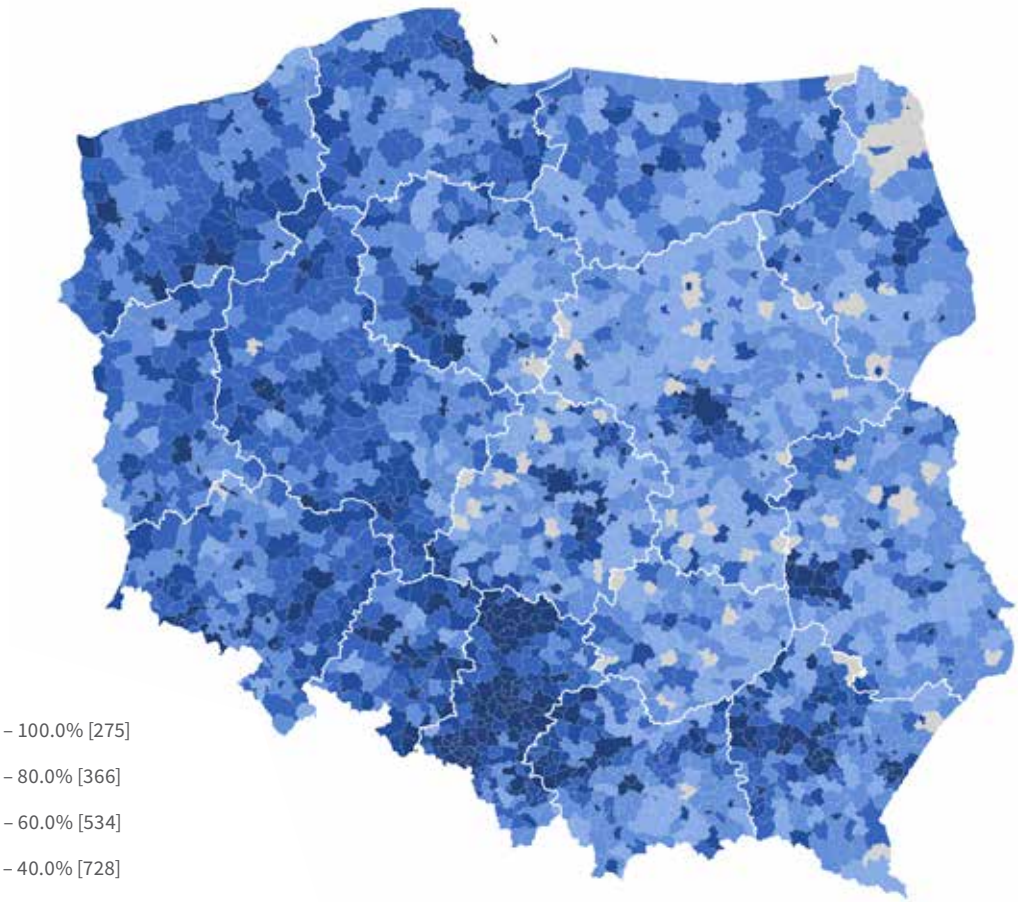
Source: UKE

3.2. Household penetration

In order to assess the implementation of the provisions of the European Digital Agenda, a household penetration rate was used, understood as the ratio of the number of residential apartments in buildings within coverage of a network with the minimum of 30 Mb/s (buildings in which operators declare the possibility of providing particular services) to the total number of residential apartments in the analysed area. The average household penetration rate with fixed-line internet of at least 30 Mb/s amounts to approx. 67% and increased, compared to the preceding year by 1 percentage point. The highest penetration is invariably characteristic of Silesia (nearly 84%), while the lowest – Świętokrzyskie region (42%).

Map 6

Household penetration with fixed-line internet of at least 30 Mb/s



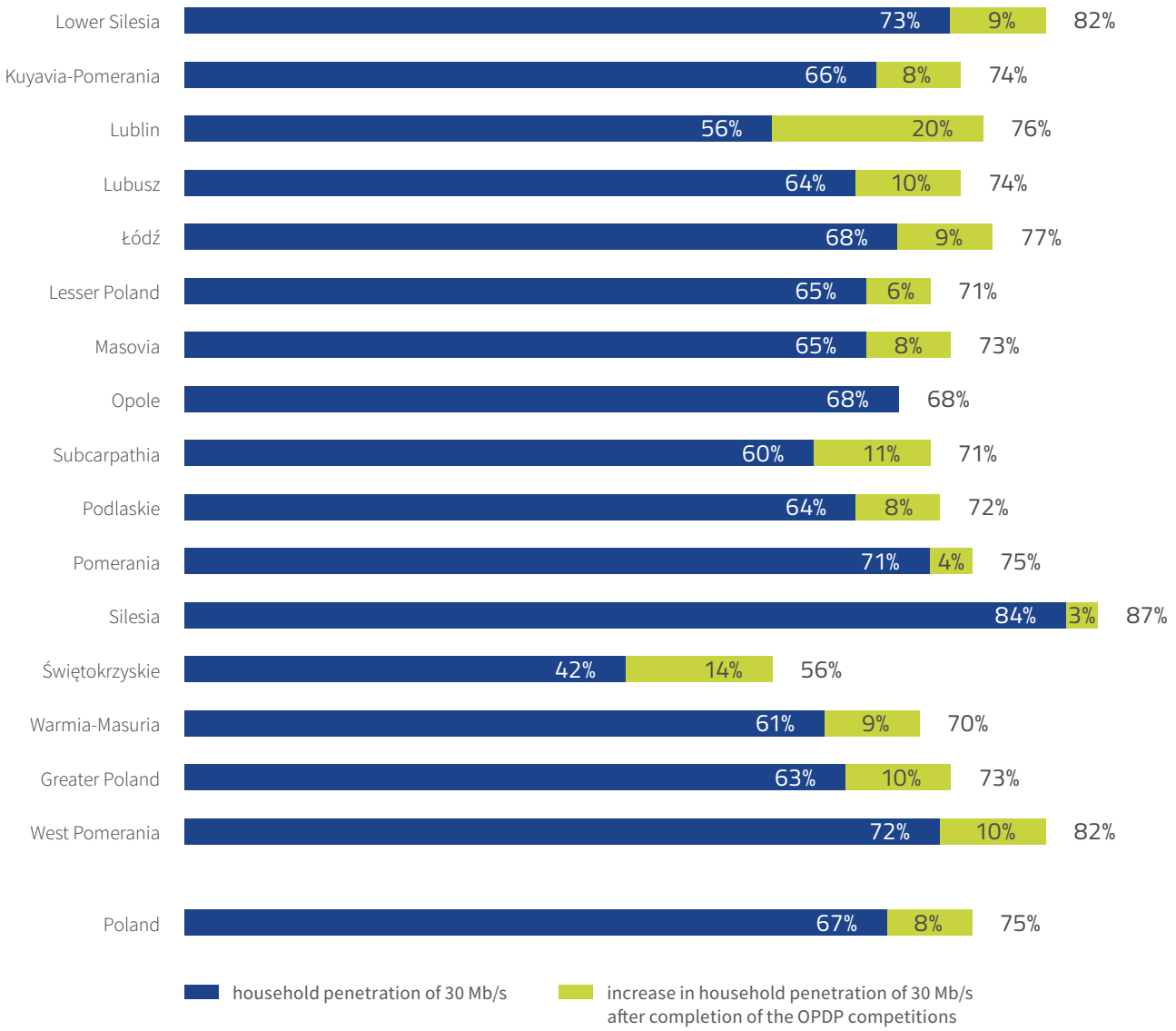
80.1% – 100.0% [275]
60.1% – 80.0% [366]
40.1% – 60.0% [534]
20.1% – 40.0% [728]
5.1% – 20.0% [512]
0% – 5% [63]

Source: UKE

The implementation of investments related to Measure 1.1 of the Digital Poland Operational Programme should result in an increase in household penetration from 66% to nearly 76%. The best effects of the investments should be expected in Świętokrzyskie and Subcarpathia regions.

Chart 12

Household penetration with fixed-line internet of at least 30 Mb/s after the implementation of competitions within the OPDP

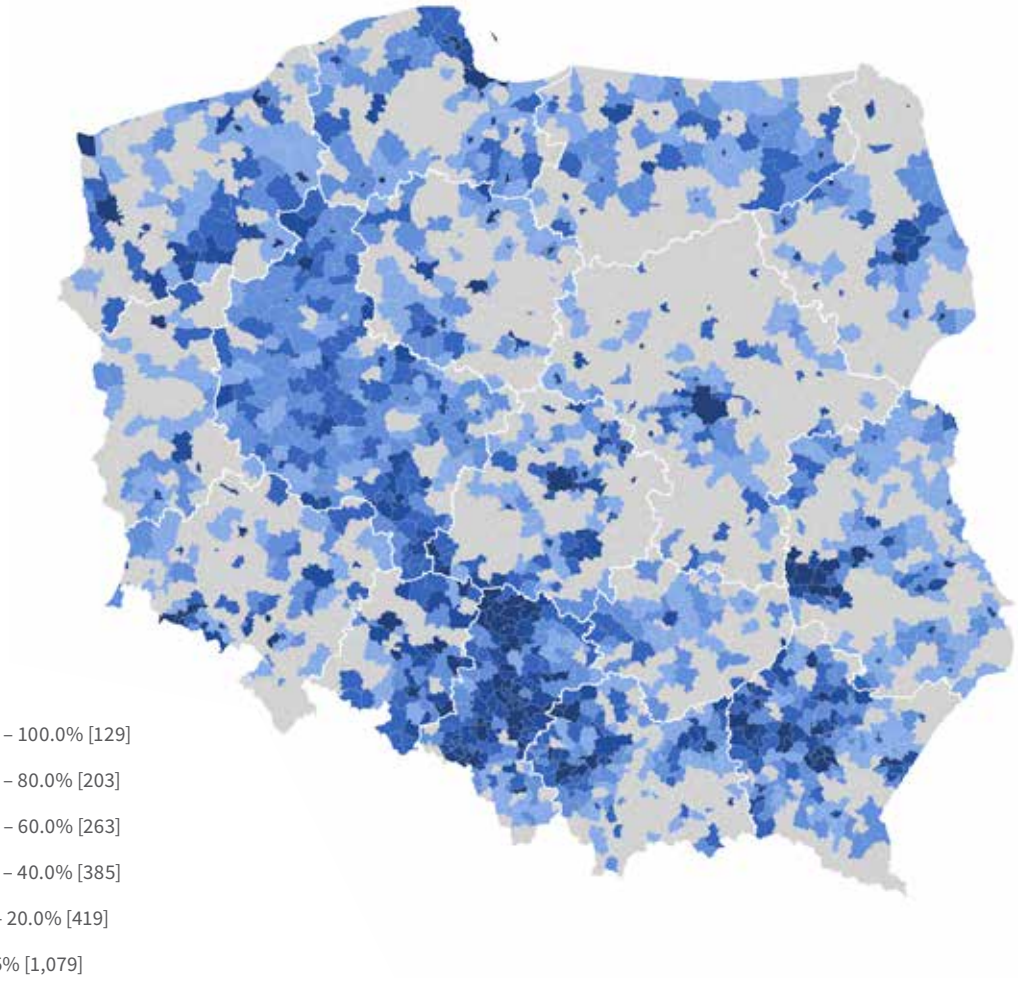


Source: UKE

Access to the services of the highest speeds, at least 100 Mb/s, is provided for over half of all households (residential apartments) – mainly in large cities. In this respect, the inhabitants of Silesia (68%) are in the best situation. The situation is the worst in Świętokrzyskie (less than 27%).

Map 7

Household penetration with fixed-line internet of at least 100 Mb/s

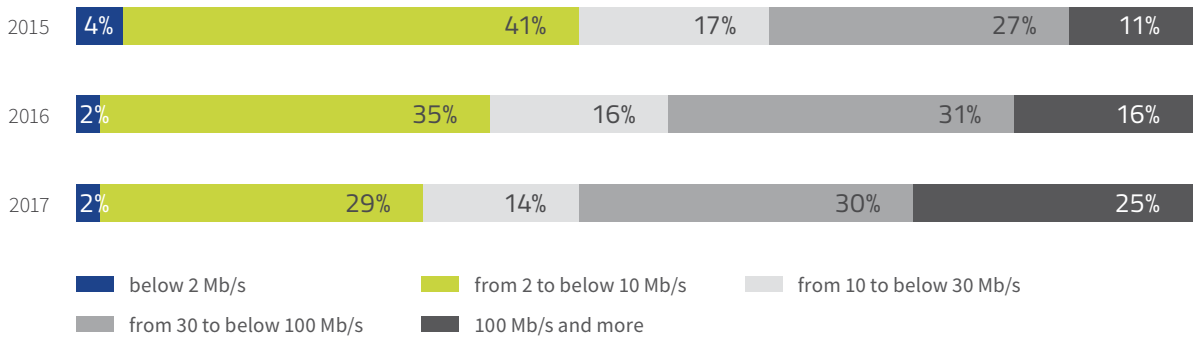


Source: UKE

One of the objectives of the EDA is to stimulate demand for services with a speed of at least 100 Mb/s and take up by 50% of households by the end of 2020. Currently in Poland, such services are used by 25% of households that use fixed-line internet access. In the past two years, there had been more than a double increase increase in the volume of such services with a relatively small increase in the total volume of fixed-line internet access, which indicates that consumers give up low speed services in favour of those with better parameters.

Chart 13

Share of fixed-line internet access services speed categories in the total number of such services



Source: UKE

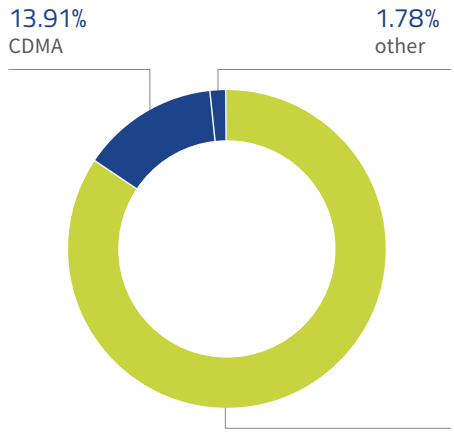
3.3. Mobile network coverage

Contrary to the coverage of fixed-line networks, mobile internet coverage is reported by spatial indication of address points located in the technological coverage of base stations. Reports by operators for 2017 indicate that the LTE technology is steadily leading among mobile technologies, the share of it having increased by approx. 2 p.p., compared to 2016 and amounting to more than 84% in 2017.

The reported data shows that 2,837 localities in Poland are deprived of internet access. Their number decreased by about 8 p.p. compared to 2016, when 3,080 such localities were identified. It should be noted that such localities are very small settlements with several dozen buildings. 3,722 localities without internet access in the LTE technology were identified, for which however coverage of less advanced technologies was reported.

Chart 14

Share of individual technologies in the mobile internet coverage



Source: UKE

Map 8

Localities without internet access

Source: UKE

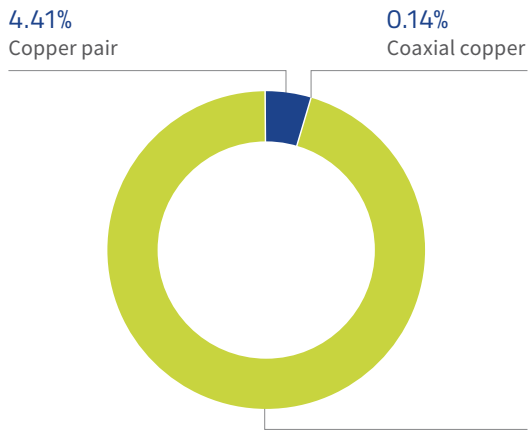
4. Wired network routes

The length of wired telecommunications lines, estimated on the basis of information provided by the entities obliged to report, equals 436,000 km as at the end of 2017. This means a decrease compared to the previous year by approx. 66,000 km. The discrepancy is due to the intervention of UKE with the entities that had been overstating the length of their networks. The record holder is an entity with a decrease of approx. 72,000 km – from 76,724 km to 4,513 km.

Share values of individual technologies in the wired infrastructure are close to the values from 2015.

Chart 15

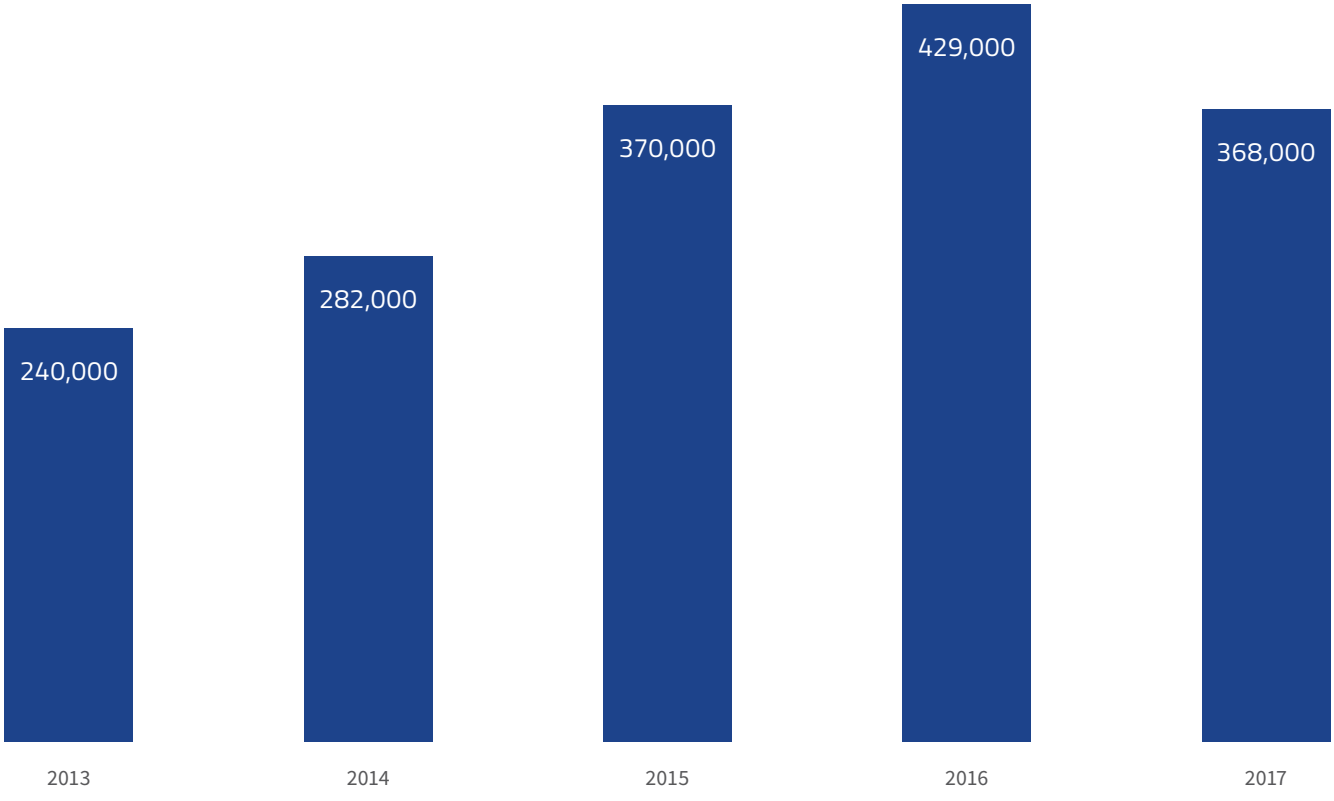
Participation of technologies in wired infrastructure



Source: UKE

Chart 16

Lengths of own fibre networks in 2013 – 2107

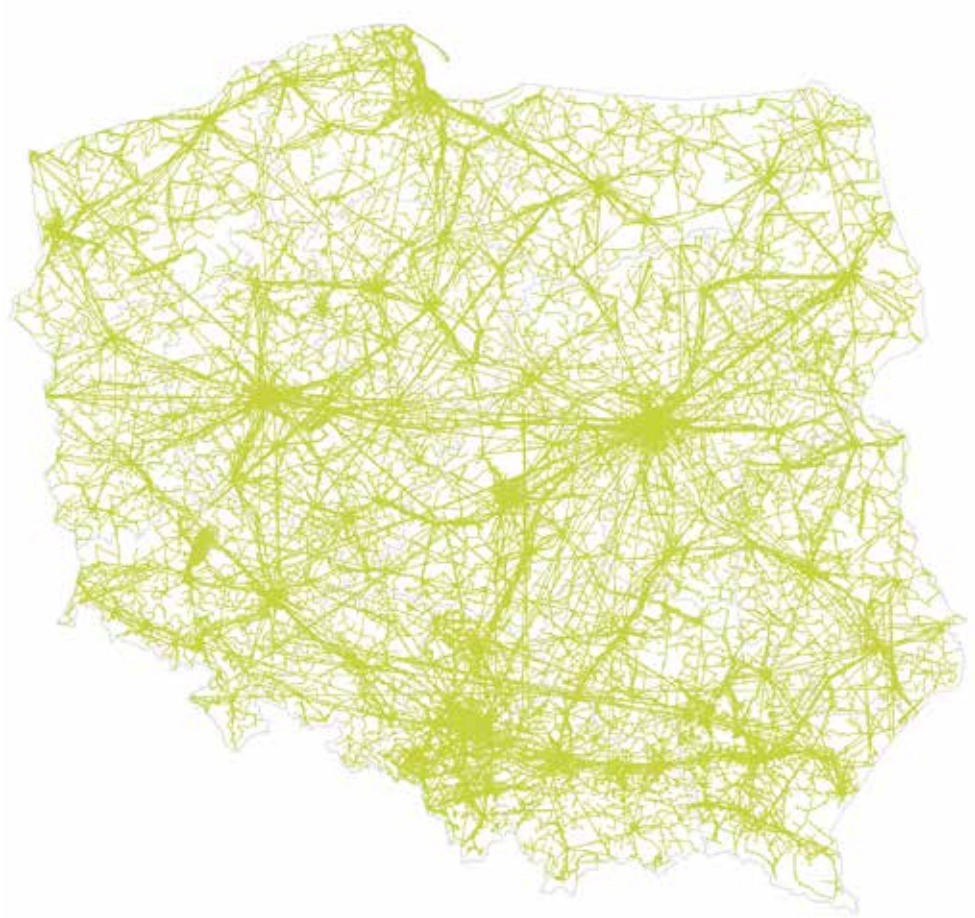


Source: UKE

The evident increased density of fibre lines is associated with highly urbanized areas (the conurbations of Silesia, Tri-City, Warsaw, Poznan, Wroclaw, etc.) and connections between the main urban centres along inter-regional communication routes.

Map 9

Fibre networks routes in Poland



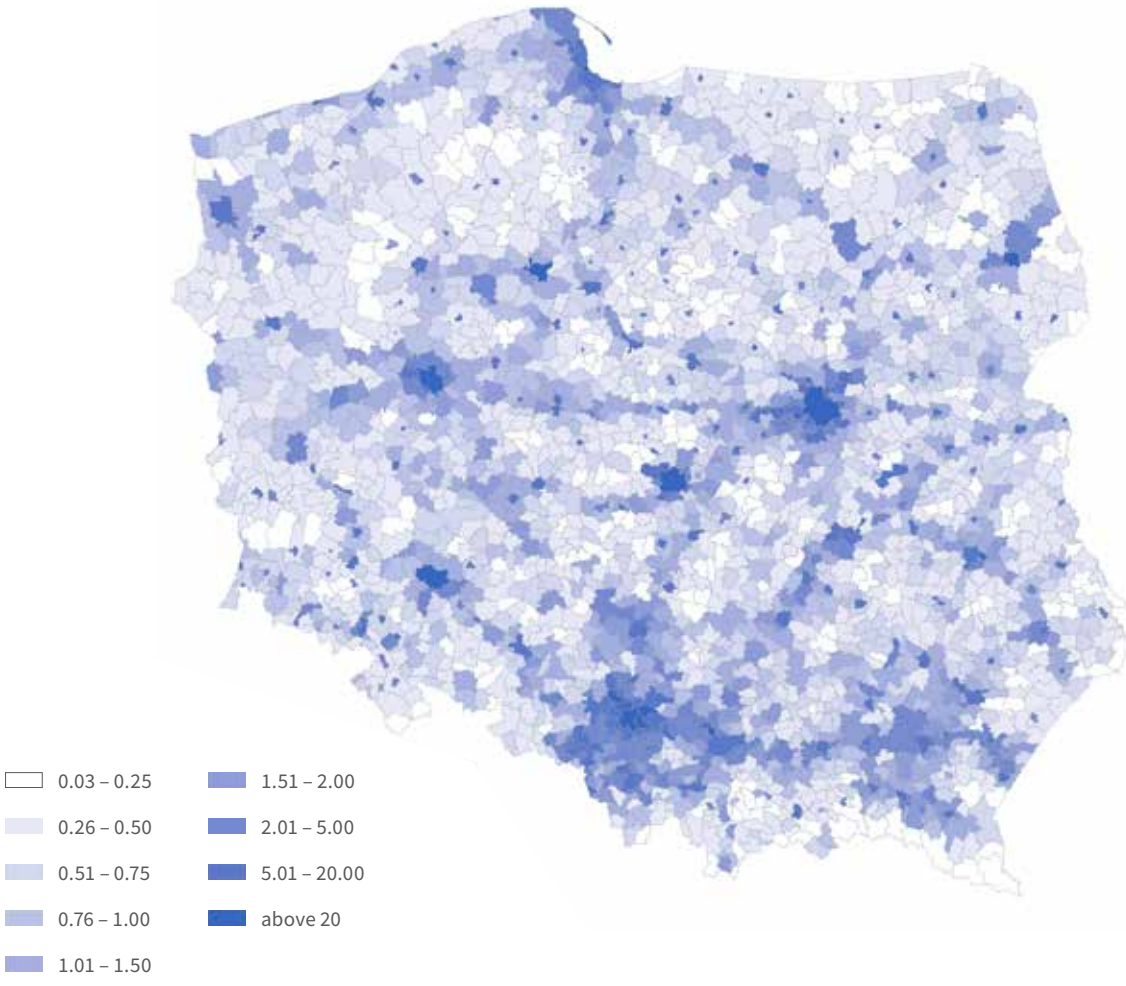
fibre lines

Source: UKE

It should be noted that as part of the infrastructure inventory information about the relations between nodes is collected, not about the actual network routes, which results in the limited precision of the estimated density indicators for individual areas, especially those located between large cities.

Map 10

Line infrastructure density

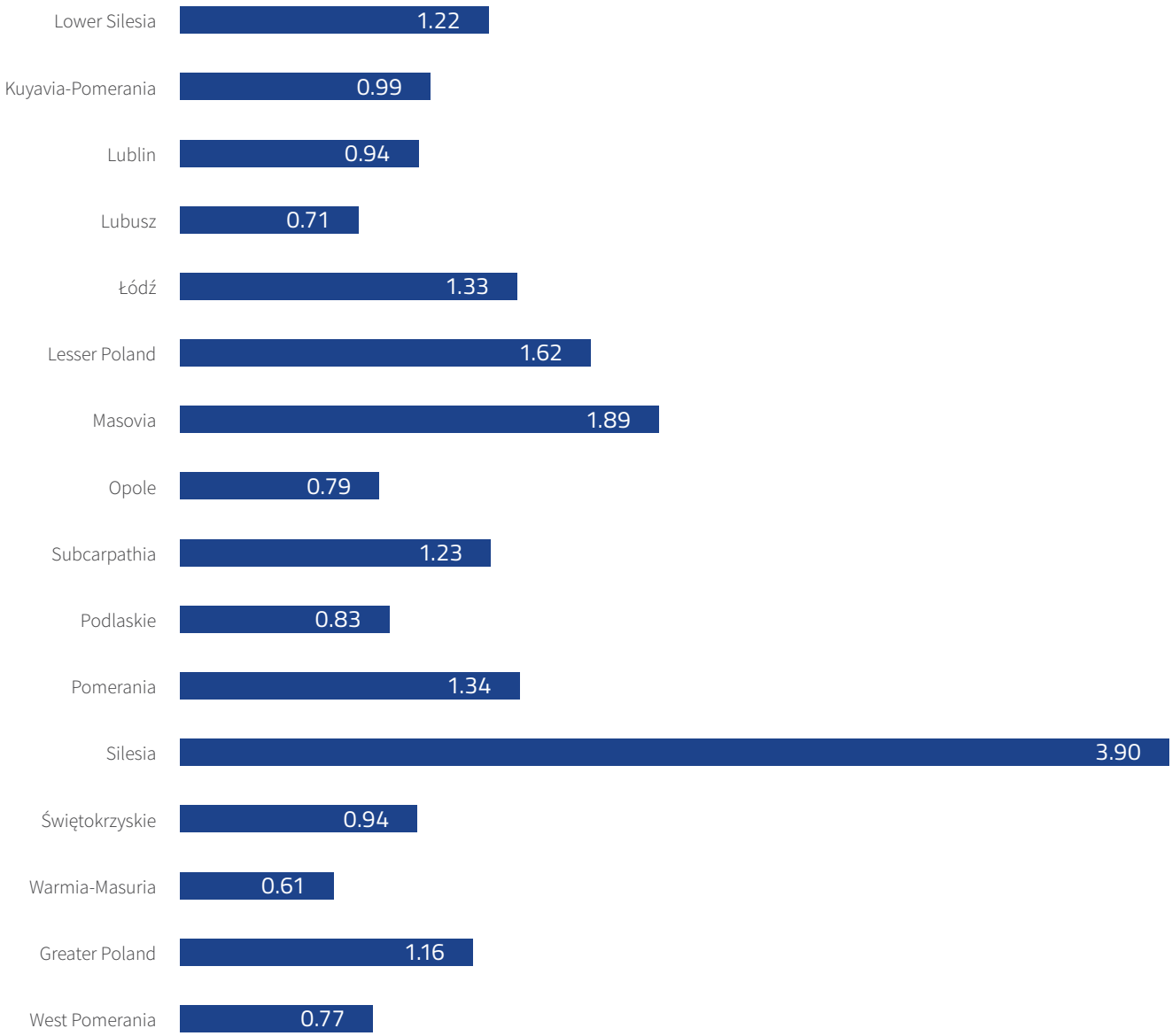


Source: UKE

The average density of line infrastructure in Poland is 1.24 km/km^2, in relation to the base value of 1.57 km/km^2 in the previous year. The highest density of line infrastructure (over 2 km/km^2) is recorded in the following regions: Silesia, Łódź and Lower Silesia. At the same time, the above-mentioned regions taken together hold 1/3 of the national line infrastructure.

Chart 17

Density of line infrastructure in regions



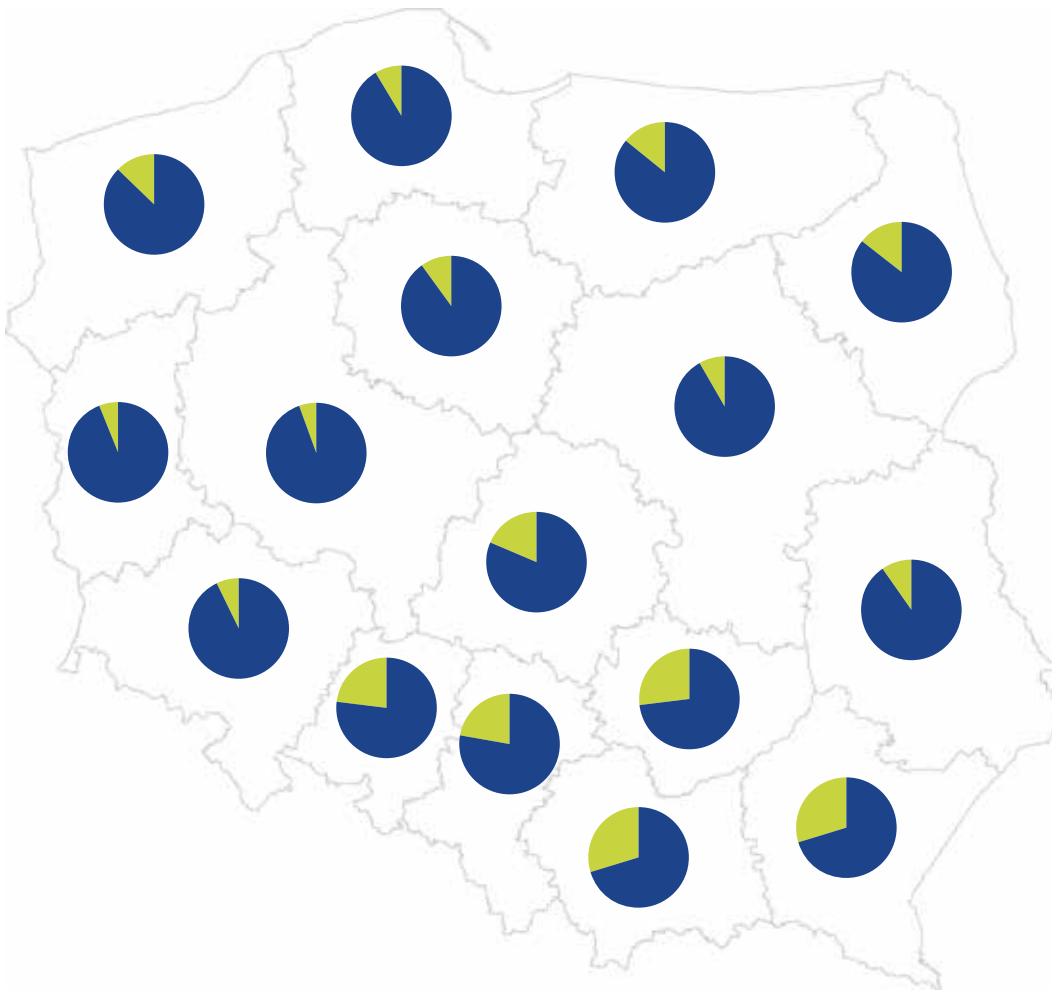
Source: UKE

The share of the overhead route, depending on the region, is 5 to 35 percent. The map below presents a spatial relationship – the regions in the south of Poland are characterized by a higher share of the overhead network, which can result from natural conditions (e.g. topography).

A similar link is observed in Eastern Poland, which is probably a consequence of the lesser urbanization of the areas and the resulting lower profitability of duct investments.

Map 11

The overhead and underground routes in the total length of fibre network



overhead route (53,000 km) underground route (314,000 km)

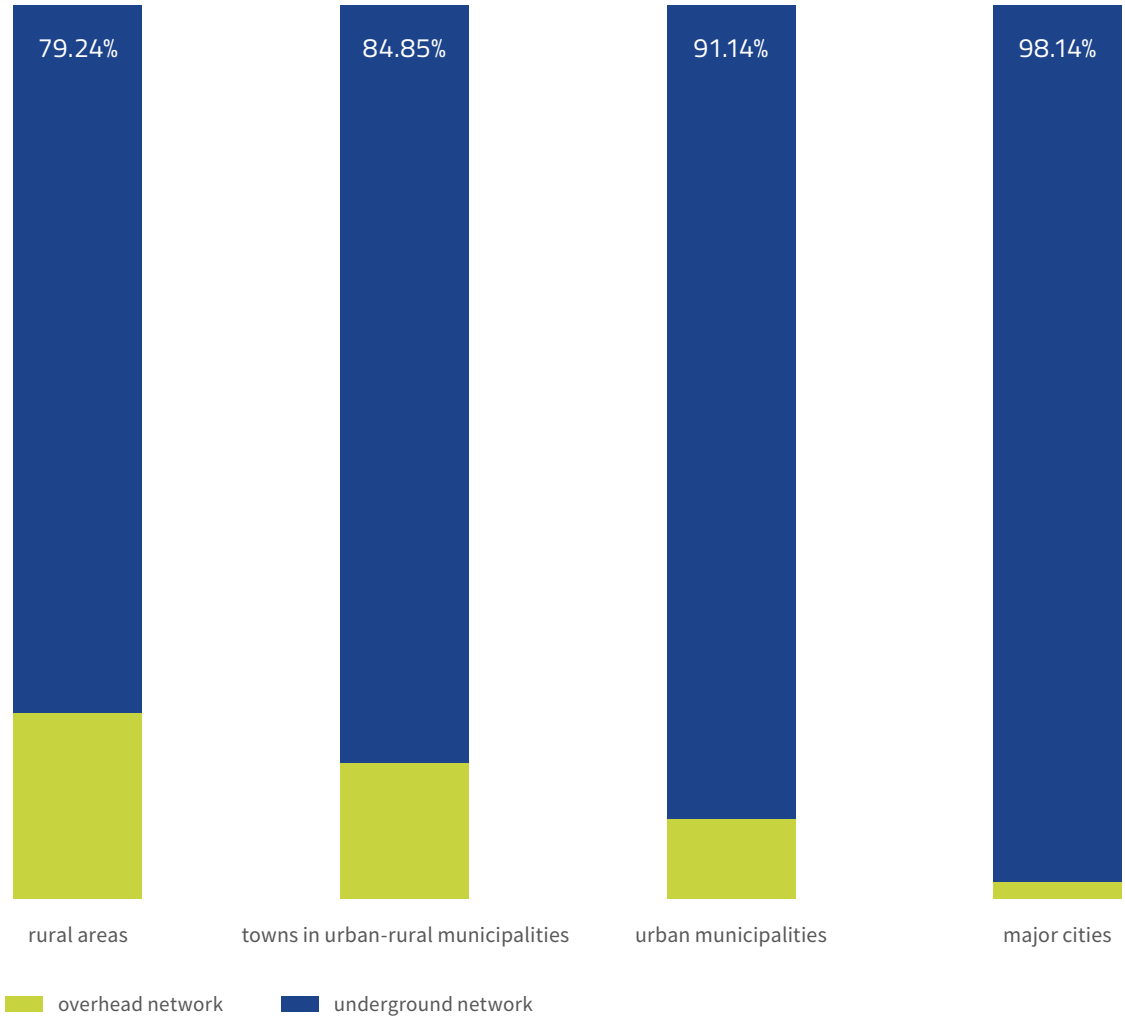
Source: UKE

As in preceding years, there is a continuing relationship between the ratio of overhead infrastructure to underground infrastructure on the one hand and the level of urbanization on the other.

In rural areas overhead networks have a clearly larger share (about 20.7%) than in urbanized areas (about 8.9%). However, as compared to the preceding year's data, all categories show an increased share of the underground network in relation to the overhead one. What is more, rural areas are less and less different in this respect from small towns. The influence of a new type of investments using underground routes, often located in roads, is also noticeable.

Chart 18

Network routes in various types of areas



Source: UKE

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