UKE | Office of Electronic Communications

Report on the state of the telecommunications market in 2022

Warsaw, June 2023

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Introduction

We present you the report on the state of the telecommunications market in Poland in 2022.
The report is based on data obtained from obligated entities:

- pursuant to Article 7(1) of the Telecommunications Act,
- pursuant to Article 29(2) of the Act on Support for the Development of Telecommunications Services and Networks,
- based on actual and theoretical coverage from the SIDUSIS Fixed Broadband Information System[1]

and

- based on data provided by wholesale service providers.

In 2022, revenues from telecommunications activities amounted to PLN 40.63 billion, down by 0.4% year-on-year. Telecommunications investment spending amounted to PLN 11.24 billion, a 26.3% increase over 2021. The value of the infrastructure at the end of 2022 was PLN 47.84 billion. This represents a 10.7% increase over the previous reporting year.

Mobile telephony in 2022 accounted for 35.2% of the value of the telecommunications market. Service revenues rose 7.6% year-on-year to PLN 14.40 billion. The total number of SIM cards increased by 4.8% to 59.28 million, of which 11.3% were M2M cards. The number of RCS messages sent domestically increased (by 23.0%), while the number of SMS messages sent decreased by 4.1%. After the SARS-CoV-2 pandemic, the volume of roaming services has returned to its pre-pandemic state.

The number of VoIP telephony users reached 2.85 million last year. 80.2% of the users were residential users. In 2022, with an increase in users of the service (2.59 million in 2021), there was a 5.5% drop in revenue to a value of PLN 0.32 billion. 94.1% of total VoIP revenues came from users to whom services were provided on a subscription basis.

In 2022, telephone services provided on the fixed telecommunications network were used by 2.43 million subscribers, down by 10.7% compared to the previous year. Revenues from the provision of services amounted to PLN 1.07 billion, down by 12.6% from 2021. The penetration of fixed telephony services (lines) is steadily declining. Last year, the percentage rate for the country as a whole was 6.8%. The total duration of phone calls was 3.05 billion minutes, down by 8.9% compared to the previous year. The fixed telephony market in Poland is one of the cheaper markets in the European Union.

Penetration of broadband Internet access services in Poland has increased for another year in a row. Fixed Internet services were used by 63.2% of households in 2022, up 3.4 percentage points compared to the previous year. The most popular fixed technology was fiber optics. FTTH's share of users rose to 38.3%, moving cable TV connections from first place in 2021 to second in 2022. Fixed Internet in Poland continues to accelerate, but more slowly than in previous years. Internet with a minimum speed of 100 Mbps was used by69.9% of fixed Internet users in 2022. Poland was among the top EU countries in terms of low prices for fixed Internet access services. Only Hungary, Lithuania and Latvia offered lower prices. Mobile Internet in the form of dedicated devices such as modems, cards and keys was used by 8.75 million users.

[1] SIDUSIS - Information System on Access to Stationary Broadband Internet Services - a free, public database providing information on network availability in every Polish municipality. Allows you to check planned broadband investments in your area.

Revenues from the bundled services market are increasing every year, last year they amounted to PLN 11.93 billion. The number of subscribers rose to 13.92 million. In contrast, the popularity of individual packages has not changed. As in previous years, the most popular packages among all bundled services were “Mobile Telephony + Mobile Internet” (45.2%) and “Fixed Internet + Television” (15.2%). In 2022, 76.6% of bundled service subscribers used a package of 2 services, known as double play. The operator with the largest number of bundled service users was P4, whose share was 35.9%.

The number of TV service subscribers in 2022 was 10.83 million, the same as in 2021, and service revenues increased by PLN 0.04 billion to a value of PLN 6.79 billion. Entities with the largest market shares in terms of subscribers were Cyfrowy Polsat (28.1%) and Canal+ Polska (19.5%). The most popular type of access to services was satellite access (47.6%). IPTV increased its share to 16.0%.

In 2022, the highest building penetration of fixed Internet coverage of at least 30 Mbps was seen in the following voivodeships: Subcarpathian (94%), Silesian (89%) and Lesser Poland (85%). By contrast, the lowest coverage was in Pomeranian (61%), Warmian-Masurian (63%) and Kuyavian-Pomeranian (68%) voivodeships. Most of the municipalities where building penetration was less than 5% were located in the northern part of the country.

The highest building penetration of fixed Internet coverage of at least 100 Mbps was in the following voivodeships: Subcarpathian (85%), Silesian (78%) and Lesser Poland (75%), and the lowest in the Pomeranian (40%), Warmian-Masurian (43%) and West Pomeranian (46%).

The highest mobile Internet speeds primarily covered the eight largest metropolitan areas, but also included most county cities.

The report also presents basic information provided by the four largest wholesale service providers. Open wholesale broadband networks are increasingly popular with nationwide as well as local providers of retail fixed Internet access service.

1 | Legal framework governing the telecommunications market

The legal framework governing the market for telecommunications services is presented as two categories:

- European law,
- National law.

1.1 | European law

Among the most important acts regulating the European Union's telecommunications market in 2022 were:

- Directive 2002/21/EC of the European Parliament and of the Council of 7 March 2002 on a common regulatory framework for electronic communications networks and services (Framework Directive),
- 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,
- Directive (EU) 2018/1972 of the European Parliament and of the Council of 11 December 2018 establishing the European Electronic Communications Code,
- Directive 2002/22/EC of the European Parliament and of the Council of 7 March 2002 on universal service and users' rights relating to electronic communications networks and services (Universal Service Directive)
- Regulation (EU) 2022/612 of the European Parliament and of the Council of 6 April 2022 on roaming on public mobile communications networks within the Union.

1.2 | National law

The framework for the operation of the telecommunications services market in Poland in 2022 was the following legislation:

- Telecommunications Act of 16 July 2004, hereinafter "Telecommunications Act"

and the implementing act of this law:

- regulation of the Minister of Digital Affairs of 7 December 2018 on the transmission of data on telecommunications activities.

Pursuant to Article 192(3) of the Telecommunications Act, the President of the Office of Electronic Communications is required to issue an annual report on the state of the telecommunications market for the previous year. In this regard, the Act has been in force unchanged for many years.

The sources of information used to write the first part of the report on the state of the telecommunications market in Poland are mainly data on the type and scope of telecommunications activities performed and the volume of sales of telecommunications services for the previous calendar year obtained from telecommunications entrepreneurs under Article 7 of the Telecommunications Act.

Specimens of the forms by which entrepreneurs are required to transfer data in accordance with Article 7(3) of the Telecommunications Act are specified in the Regulation on the transmission of data on telecommunications activities. The regulation has not changed since 2018.

- The Act of 7 May 2010 on Support for the Development of Telecommunications Services and Networks, hereinafter the "Mega Act", and its implementing act: the Regulation of the Minister of Digital Affairs of 19 December 2022 on the inventory of telecommunications infrastructure and services.

The information for the second part of the report on telecommunications infrastructure comes from data collected under Article 29(2a) of the Mega Act from telecommunications entrepreneurs and other entities with telecommunications infrastructure.

The type of infrastructure, information on provided telephone, broadband Internet access and other services to be inventoried, and the scale of the maps on which the inventory is made are specified in the Regulation on the inventory of telecommunications infrastructure and services.

As of early 2023, regulations related to the inventory of telecommunications infrastructure and services have changed. The change in regulations was dictated, among other things, by the obligation to implement the European Electronic Communications Code, amendments to the Act on Support for the Development of Telecommunications Services and Networks, and implementation of the Guidelines of the Body of European Regulators for Electronic Communications – BEREC.

The most important changes introduced in the Mega Act concern:

- expansion of the scope of the inventory to include information on the routes of fiber optic cable lines that provide or enable the provision of broadband Internet access and information held in electronic form, on the routing of non-fiber optic cable lines that provide or enable the provision of broadband Internet access
- changes in frequency and inventory completion dates for telecommunications infrastructure and networks – 2 inventory dates:
  - by 31 August – for the period from 1 January to 30 June
  - by 28 February – for the period from 1 July to 31 December.

The method of data transfer has also been modified. The transmission of data through the Information System on Broadband Infrastructure (SIIS) has been abandoned, instead, the ICT tool provided by the President of UKE will be used for this purpose (according to §6(1) of the aforementioned regulation).

Due to the entry into force of the Regulation of the Minister of Digital Affairs of 19 December 2022 on the inventory of telecommunications infrastructure and services, the structure of Appendix No. 1, which includes the specimen forms for submitting the required information to the President of UKE, has changed. In addition, the new Regulation expanded the scope of information provided to include:

- own or shared flexibility points (including service access points),
- routing of fiber optic and non-fiber optic cable lines that provide or enable the provision of broadband Internet access,
- mobile base station cells of public telecommunications networks,
- coverage of mobile public telecommunications networks.

2 Telecommunications market participants

Participants in the telecommunications services market in Poland are:

- national regulatory authority (President of UKE)
- telecommunications entrepreneurs (TEs),
- local government units (LGU),
- entities performing public utility tasks (PUP).

2.1 | Regulatory authority

The central government authority for the telecommunications market is the President of the Office of Electronic Communications (President of UKE). Their area of competence, as defined by the Telecommunications Act and the Postal Act, primarily includes regulatory activities in the field of telecommunications and postal services, management of frequency resources, and market surveillance in the control of products that emit or are susceptible to emission of electromagnetic fields.

In the telecommunications market, the President of UKE cooperates with a number of national, European and international organisations. Among those cooperating with the President of UKE at the national level is primarily the Ministry of Digital Affairs. Key groups of international cooperation include: European Commission (EC), the Body of European Regulators for Electronic Communications (BEREC), the Organisation for Economic Co-operation and Development (OECD) and the International Telecommunication Union (ITU).

2.2 | Telecommunications entrepreneurs

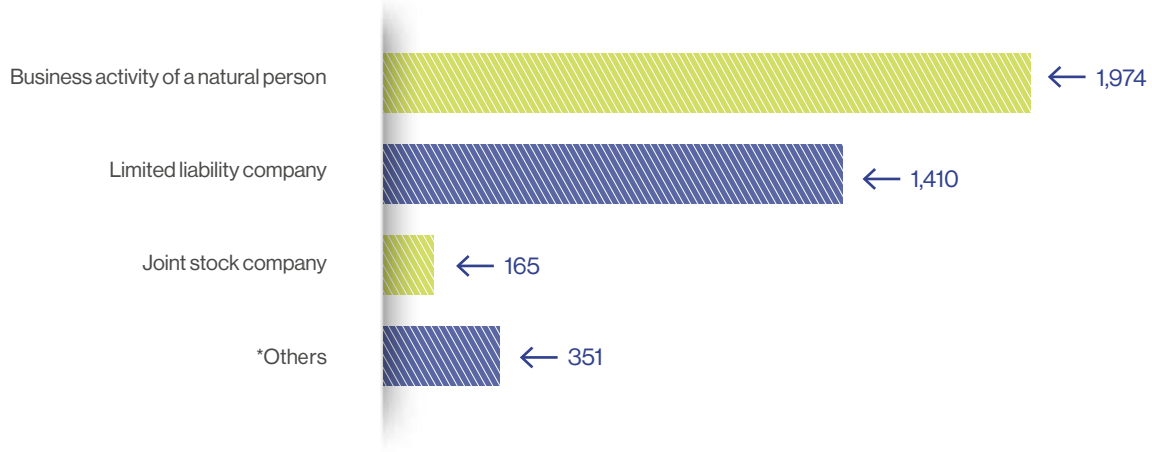
As of 31 December 2022, 3,900 entrepreneurs were entered into the Register of Telecommunications Entrepreneurs (RPT) of the President of the Office of Electronic Communications (President of UKE), down 6% compared to the previous year.

The decrease in the number of entities in the RPT was a result of deletions from the Register of Telecommunications Enterprises (RPT) in 2022. They occurred due to:

- requests from entrepreneurs for deletion (215 deletions),
- deletions of entrepreneurs from CEIDG (29 deletions) and KRS (12 deletions),
- failure of entrepreneurs to fulfil information obligations (63 deletions).

Enterprises entered into the RPT operated in the following organisational and legal forms:

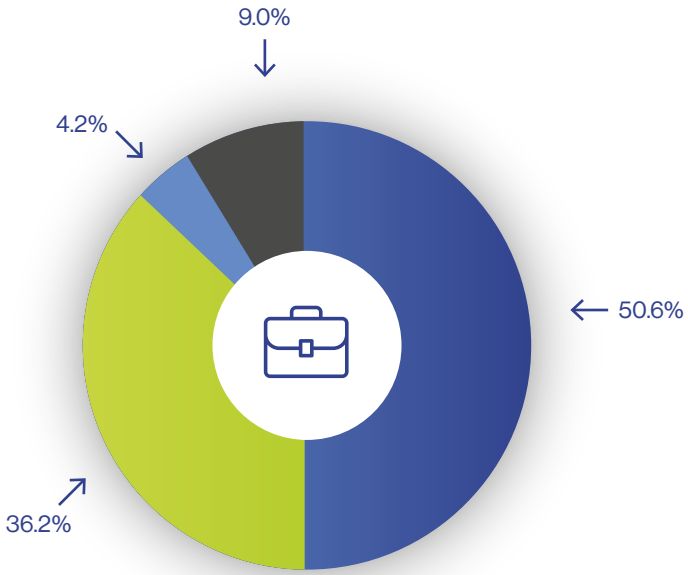
Figure 1
Organisational and legal forms of companies entered into the RPT as of 31 December 2022.



Source: Register of Telecommunications Entrepreneurs (RPT) kept by the President of UKE
* business activity of a natural person – partner in a partnership, civil partnership, general partnership, limited partnership, cooperative, association, foundation and others

The largest percentage was business activity of a natural person (50.6%), more than a third of the market (36.2%) was served by limited liability companies. 4.2% of entrepreneurs provided telecommunications services in the form of a joint stock company. Other legal forms obtained a 9.0% share in this structure.

Figure 2
Organisational and legal structure of entrepreneurs entered into the RPT as of 31 December 2022.



- business activity of a natural person limited
- liability company
- joint stock company
- *Others

Source: UKE
* business activity of a natural person – partner in a partnership, civil partnership, general partnership, limited partnership, cooperative, association, foundation and others

2.3 | Local government units

The Mega Act defines the types of telecommunications activities that can be performed by local government units (LGUs).
Local government units carrying out the activities specified by the law should be registered in the register of local government units carrying out telecommunications activities (RLGU).
The aforementioned activities of LGUs include:

- building or operating telecommunications infrastructure and networks, and acquiring rights to them,
- providing a telecommunications network,
- providing access to telecommunications infrastructure,
- provision, using its infrastructure and telecommunications networks, of telecommunications services or other services.

As of 31 December 2022, there were 542 units enrolled in RLGU, 2 fewer than as of 31 December 2022.

2.4 | Entities performing public utility tasks

According to the provisions of the Mega Act, an entity that performs public utility tasks (PUP) is a natural person, a legal person or an organisational unit without legal personality, to which special regulations grant legal capacity, providing technical infrastructure for the following purposes:

- generation, transmission or distribution of gas, electricity or heat,
- providing lighting in the places indicated in the Energy Act of 10 April 1997,
- public water supply, collection, transmission, treatment or disposal of wastewater, heating, drainage systems, including drainage lines,
- transportation, including railroads, roads, ports and airports.

No register of PUPs is kept in Poland, so it is not possible to determine their number.

3 Telecommunications market – services

The following telecommunications services are characterised in this section of the report:

- telephone services, including: mobile phone service, VoIP phone service and fixed telephony service;
- broadband Internet access service;
- bundled services;
- pay-TV service.

They are presented in order according to the number of users/subscribers served.

The total number of companies providing[2] services in the telecommunications market in 2022, out of 3900 listed in the RPT, was 3224, down by 6% compared to 2021. In the year covered by the report, 15 companies operated as large entities, while 3209 were small and medium-sized enterprises - SMEs[3]. The share of small and medium-sized companies in the number of total service providers was 99.53%, similar to the previous year.

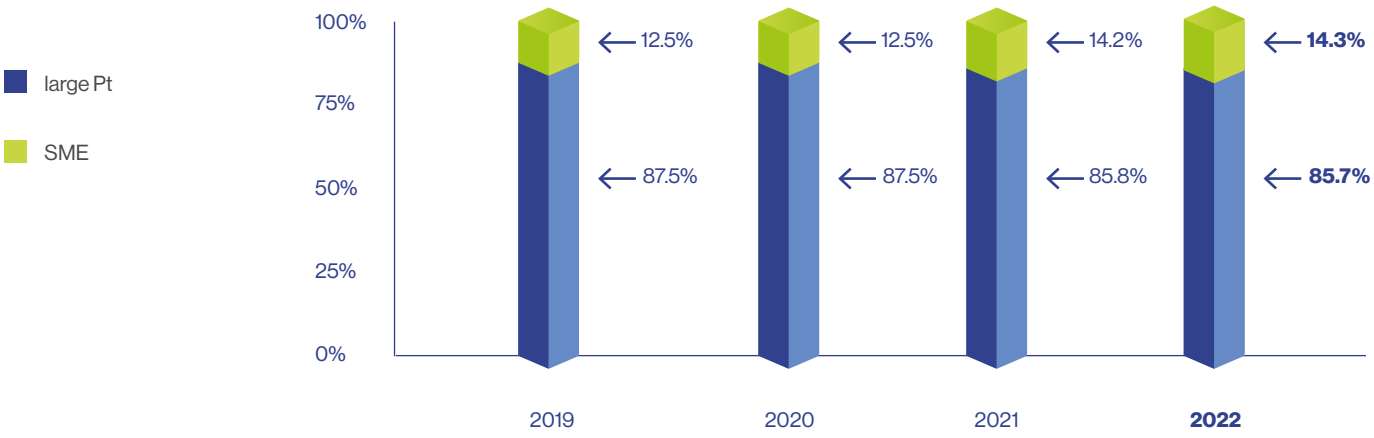
Table 1
Number of SMEs vs. large Pt

Description	2019	2020	2021	2022
Total telecommunications entrepreneurs	3,592	3,361	3,430	**3,224**
Small and medium-sized entrepreneurs	3,575	3,344	3,414	**3,209**
% SME	**99.53%**	**99.49%**	**99.53%**	**99.53%**

Source: databases maintained by UKE on the basis of reporting under Article 7 of the Telecommunications Act

Large companies, which by number accounted for 0.47% of all companies providing telecommunications services, generated 85.06% of the total revenue from telecommunications services. The revenue obtained by SMEs was PLN 6.07 billion, which accounted for 14.94% of total revenue.

Figure 3
Number of SMEs vs. large Pt

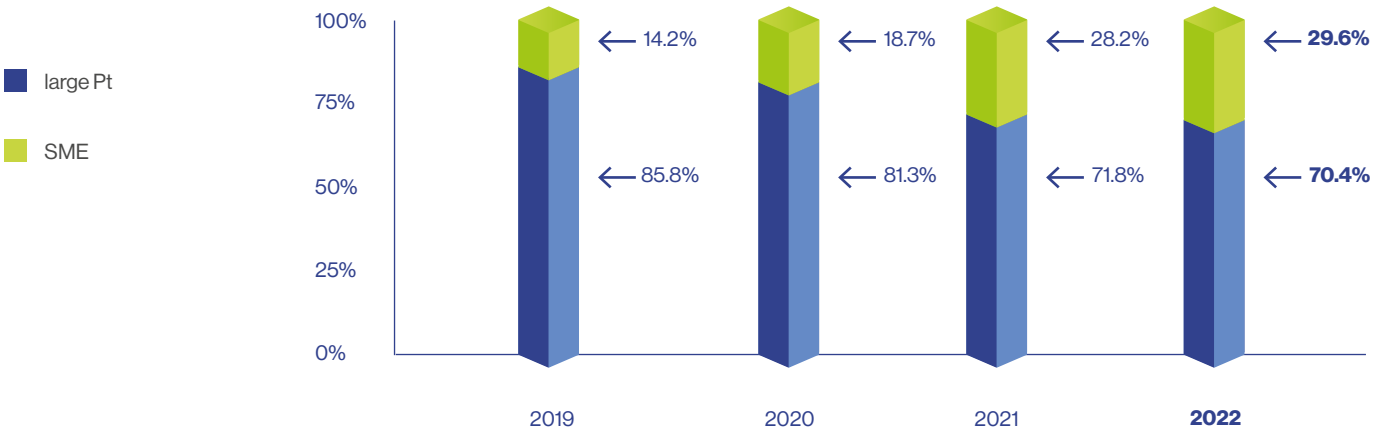


Source: databases maintained by UKE on the basis of reporting under Article 7 of the Telecommunications Act

[2] The number of entrepreneurs who have fulfilled their reporting obligations under Article 7 of the Telecommunications Act for 2022 by 17 May 2023, and have reported revenue from the provision of telecommunications services higher than zero.
[3] The size of the SME was determined on the basis of the revenue criterion listed in Annex I to Commission Regulation No. 651/2014 of 17 June 2014 declaring certain categories of aid compatible with the internal market in application of Articles 107 and 108 of the Treaty (OJ L 187, 26.6.2014, p. 1). Only an entrepreneur's annual net turnover from telecommunications activities not exceeding EUR 50 million was used to define an SME, as UKE does not have the data necessary to verify the second criterion adopted in the regulation, i.e. employment of less than 250 employees.

In the structure of realised telecommunications investments in 2022, SMEs accounted for 29.63%, an increase of 1.46 percentage points compared to the previous year. Over the recent few years there have been a noticeable decline in the contribution of large entrepreneurs to investment spending.

Figure 4
Structure of investments by entrepreneur size



Source: databases maintained by UKE on the basis of reporting under Article 7 of the Telecommunications Act

3.1 | Telephone services

The report describes the following types of telephone services:

- mobile telephony service,
- VoIP telephony service,
- fixed telephony service.

3.1.1 | Mobile telephony service

3.1.1.1 | General Information

At the end of 2022, 126 telecommunications entrepreneurs were operating in the Polish mobile telephony market.
Four these entrepreneurs had their own infrastructure (MNOs), while 122 used the network of a selected technology partner (MVNO, MVNE, ISP). The following entities functioned as MNOs: Orange Polska S.A., Polkomtel Sp. z o.o., P4 Sp. z o.o. and T-Mobile Polska S.A.

Penetration of mobile telephony services in Poland stood at 157%[4] (up 8.3 percentage points from 2021).

[4] Penetration of more than 100% is due to some users having more than one SIM card and the growing trend of active M2M SIM cards.

An important and unique factor influencing the increase in mobile telephony service penetration in 2022 was the very large influx of refugees from Ukraine following the outbreak of war. The number of SIM cards increased by 2.0 million units year-on-year, reaching 52.6 million.

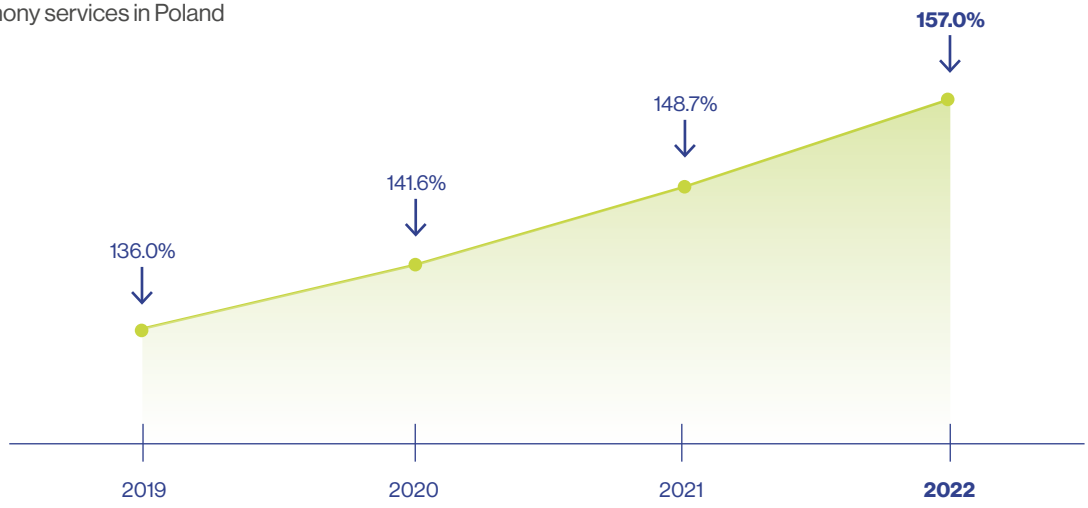
The increase in penetration is also due to an increase in the number of M2M SIM cards[5]. Their number grew by 0.7 percentage points to reach 6.69 million units. These cards accounted for 11.3% of all cards.

52.6 million SIM cards

6.7 million SIM cards

157% penetration of mobile telephony services

Figure 5
Penetration of mobile telephony services in Poland



Source: databases maintained by UKE on the basis of reporting under Article 7 of the Telecommunications Act

3.1.1.1 | Revenues

After the year 2019 with the lowest revenues earned in years, the mobile telephony market is back to where it was before the pandemic. The operators' total revenues in 2022 amounted to PLN 14.40 billion and were 7.6% higher than a year earlier.

Revenue growth of 13% was recorded in receipts from the provision of M2M services. Revenue in post-paid fees entailed a 31% increase, driven by a rapid increase in the number of SIM and M2M SIM cards and an increase in ARPU[6]. There has been a gradual decline in revenue from premium services; last year saw a 2.2% regression from 2021.
Revenue regression of 9.4% can also be seen in the MMS revenue segment. Other types of mobile telephony services saw increases. Data services generated growth of 5%, SMS services of 1.2%. Revenue growth from roaming services provided to Poles abroad was 18%.

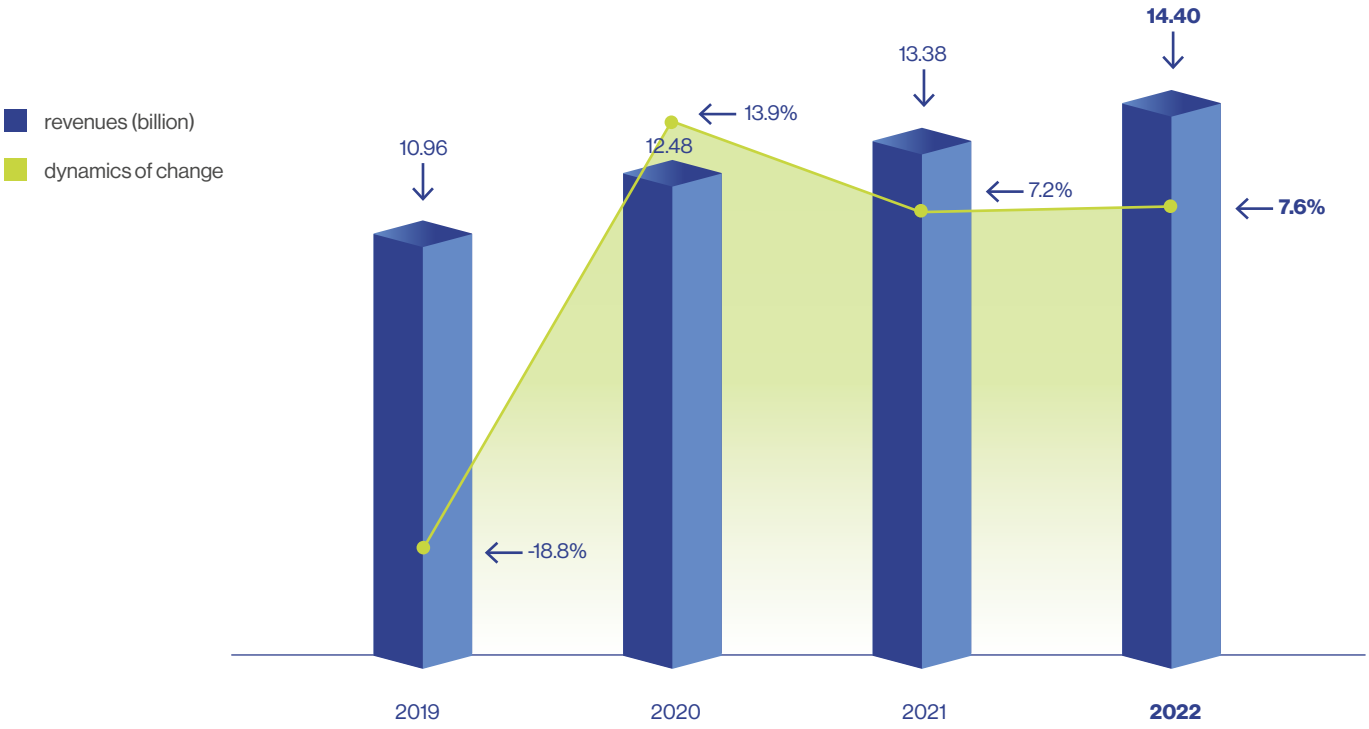
The continued growth in the value of the mobile telephony market confirms the important position of this service in the telecommunications business area. It generated 35.2% of the revenue of the total telecommunications market in Poland.

35,2%

share of mobile telephony in telecommunications market revenues

[5] M2M, or machine-to-machine, SIM cards are SIM cards that are used for machine-to-machine communication without direct human involvement.
[6] ARPU (average revenue per user) – a measure used by telecommunication operators, among others, to determine monthly service revenue per network user..

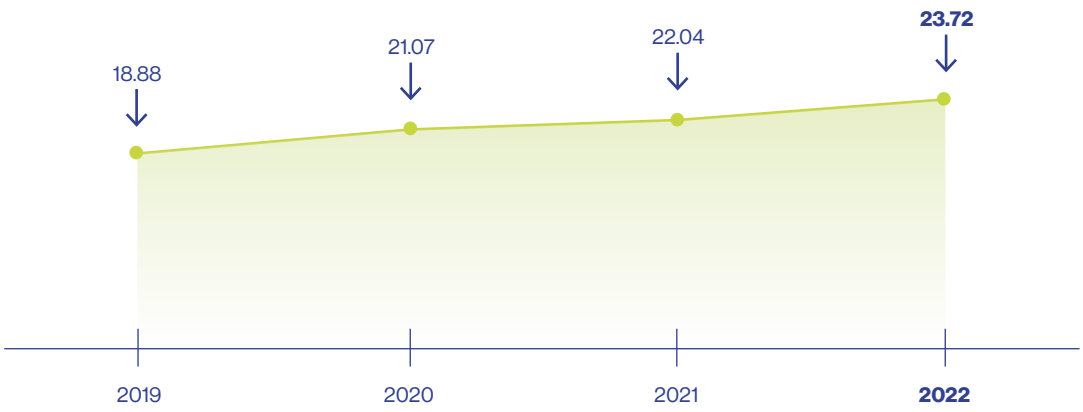
Figure 6
Revenues from mobile telephony services (billion PLN) and dynamics of change



Source: databases maintained by UKE on the basis of reporting under Article 7 of the Telecommunications Act

Monthly revenue per user rose to PLN 23.72, up PLN 4.84 from the pre-pandemic level (PLN 18.88 in 2019).

Figure 7
Average monthly revenue per user (ARPU in PLN)

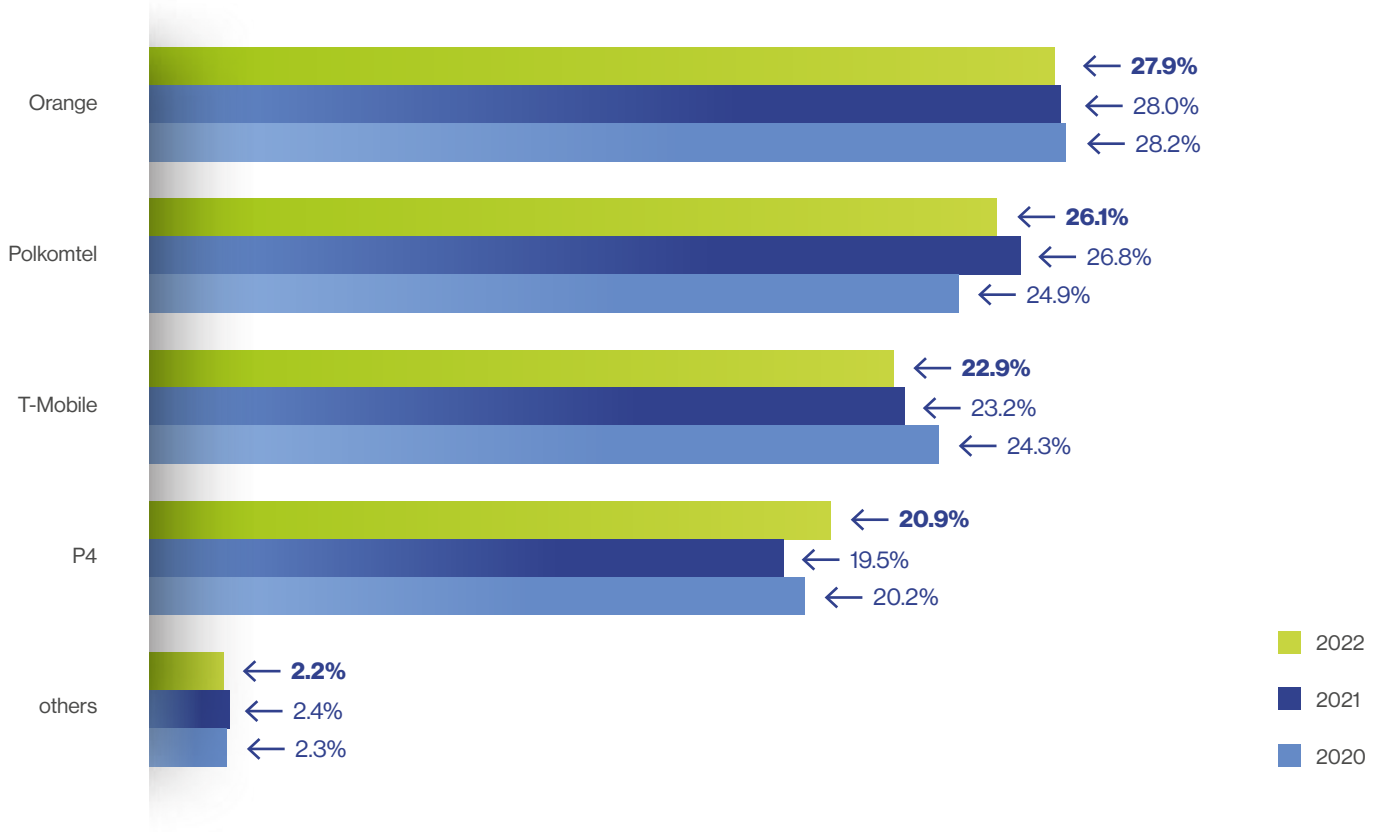


Source: UKE

In terms of revenue generated in 2022, Orange Polska ranked first, with a 27.9% share.
Polkomtel ranked second (26.1%). This was followed by T-Mobile Polska with 22.9% of total mobile telephony revenues, and fourth place with 20.9% market share went to P4.

Compared to 2021, share declines were recorded by: Orange Polska (down by 0.1 percentage points), Polkomtel (down 0.7 percentage points) and T-Mobile Polska (down by 0.4 percentage points). P4 posted an increase of 1 percentage point. Other entrepreneurs[7] scored a total of 2.2%, with a slight decrease compared to previous years.

Figure 8
Shares of operators in terms of revenue generated



Source: databases maintained by UKE on the basis of reporting under Article 7 of the Telecommunications Act

In 2022, Orange Polska held the largest percentage share of mobile SMS revenue.
This share accounted for 33.7% of the SMS market, up 0.9 percentage points from 2021. The second position was held by P4 with a 23.5% share (down by 0.9 percentage points), followed by T-Mobile Polska (22.6%) and Polkomtel (19.7%). Other operators held a 0.5% share of revenue from this service category.

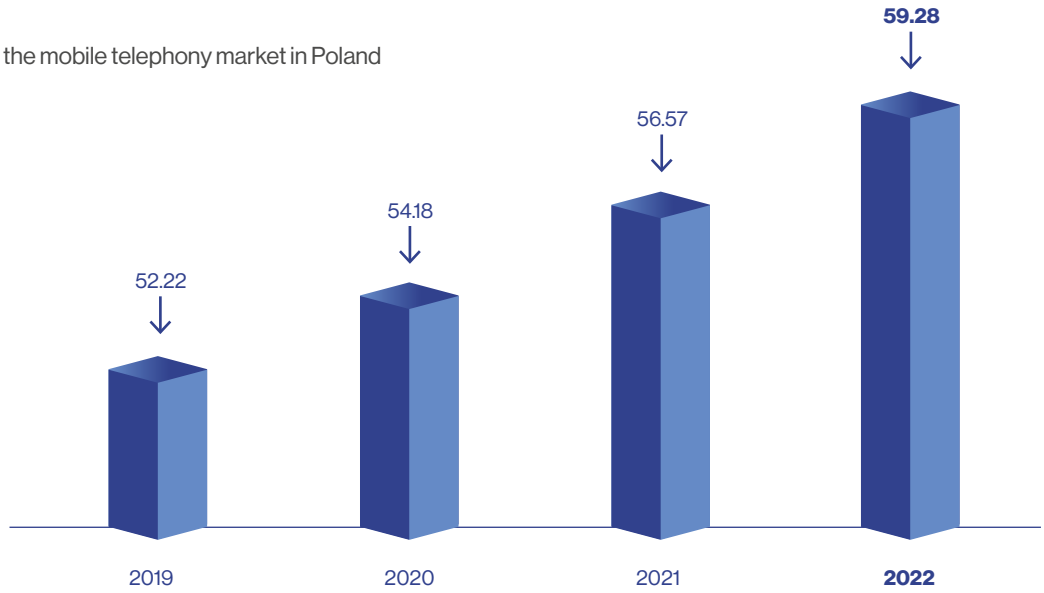
In terms of revenue from MMS messages sent, Orange Polska took the dominant position in 2022 (40.5% share). It was followed by P4 (23.2%), Polkomtel (20.6%) and T-Mobile Polska (14.6%). Other entrepreneurs earned 1.1% of revenue from MMS messages sent.

[7] The remaining entrepreneurs are 122 entrepreneurs operating in the mobile telephony market, in addition to four MNOs

3.1.1.2 | Users

The total number of cards was 59.28 million, of which 11.3% were M2M cards. This is an increase of 4.8% compared to 2021.

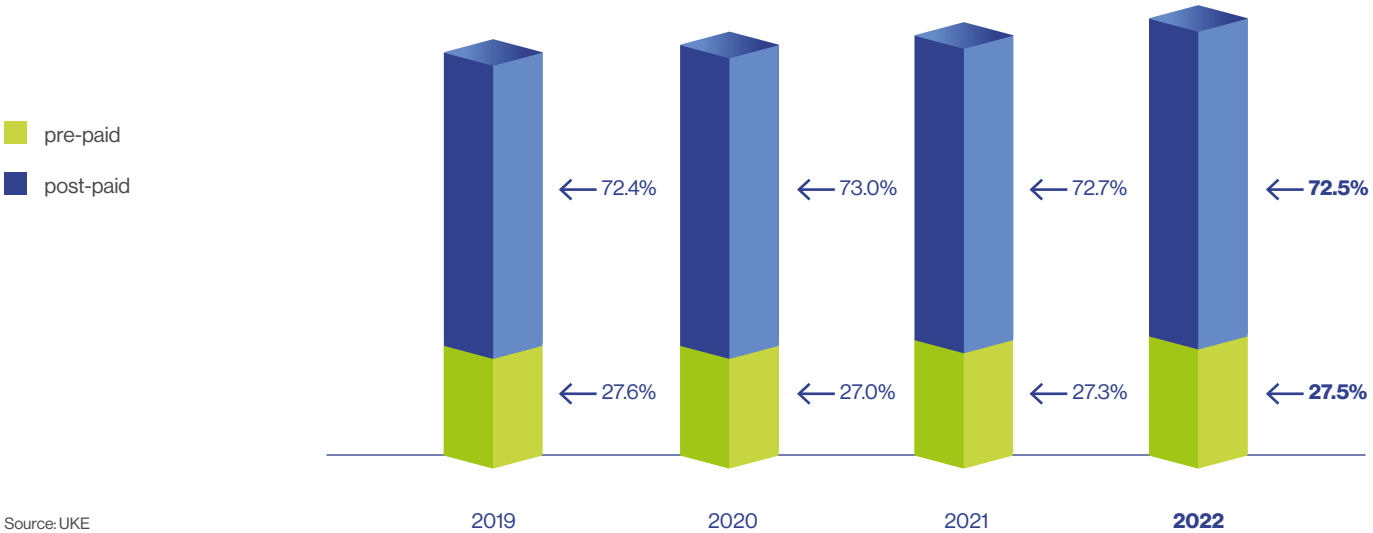
Figure 9
Total number of cards (million) in the mobile telephony market in Poland



Source: databases maintained by UKE on the basis of reporting under Article 7 of the Telecommunications Act

The downward trend in the number of users of prepaid services that had continued since 2016, mainly as a result of mandatory registration of prepaid cards, stopped in 2021. Also in 2022, we saw an increase in these services, to a level of14.47 million users, which is 0.2 percentage points higher than in 2021. It can be assumed that the biggest factor influencing this growth was the very large influx of refugees from Ukraine after the outbreak of war, who mainly chose this type of service

Figure 10
Share of pre-paid and post-paid services in the total number of SIM cards

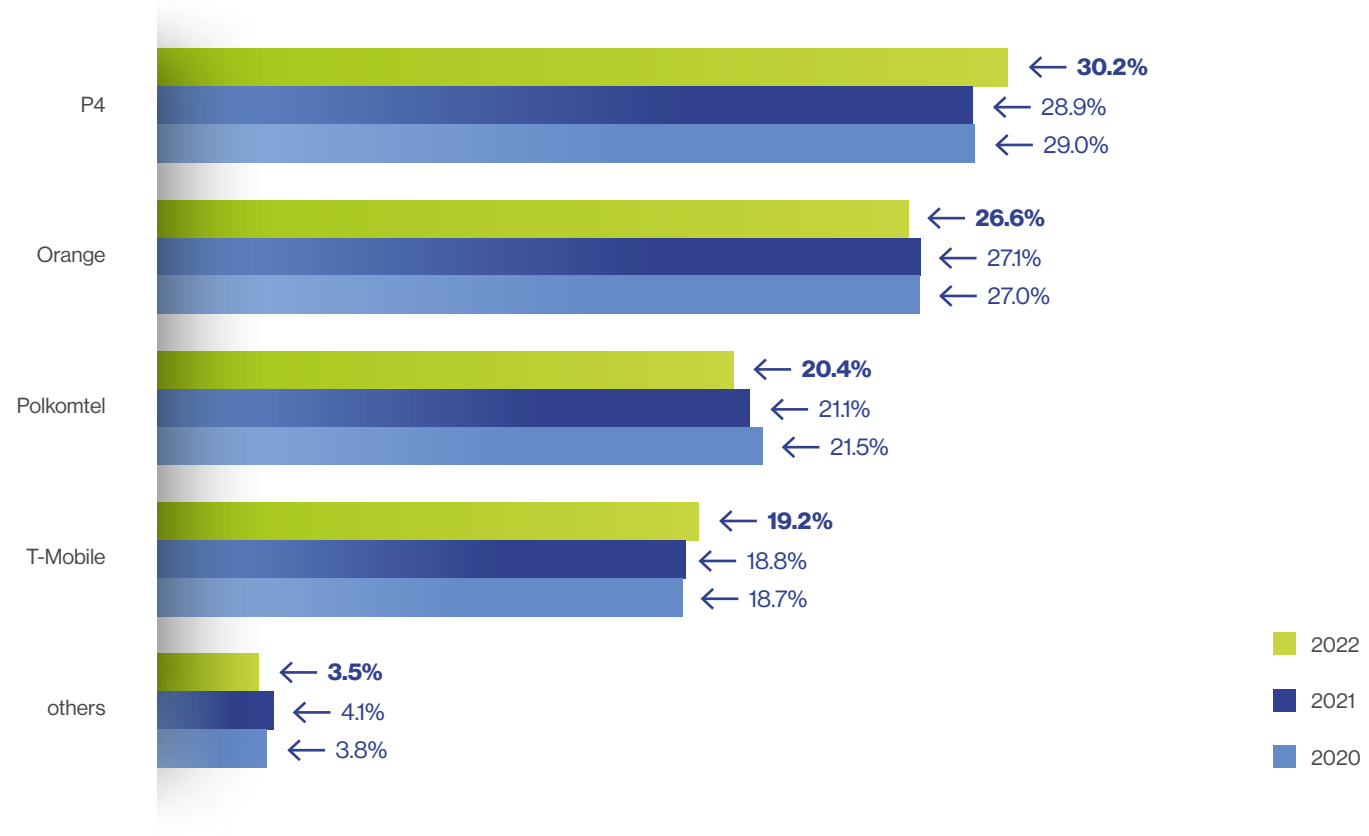


Source: UKE

The year 2022 did not bring changes in operators' shares in terms of the number of mobile telephony users.
P4 invariably led the list with a share of 30.2%.

Orange Polska ranked second (26.6%). Polkomtel ranked third (20.4%). T-Mobile Polska ranked fourth, with the share of 19.2%.

Figure 11
Shares of operators by number of users



Source: databases maintained by UKE on the basis of reporting under Article 7 of the Telecommunications Act

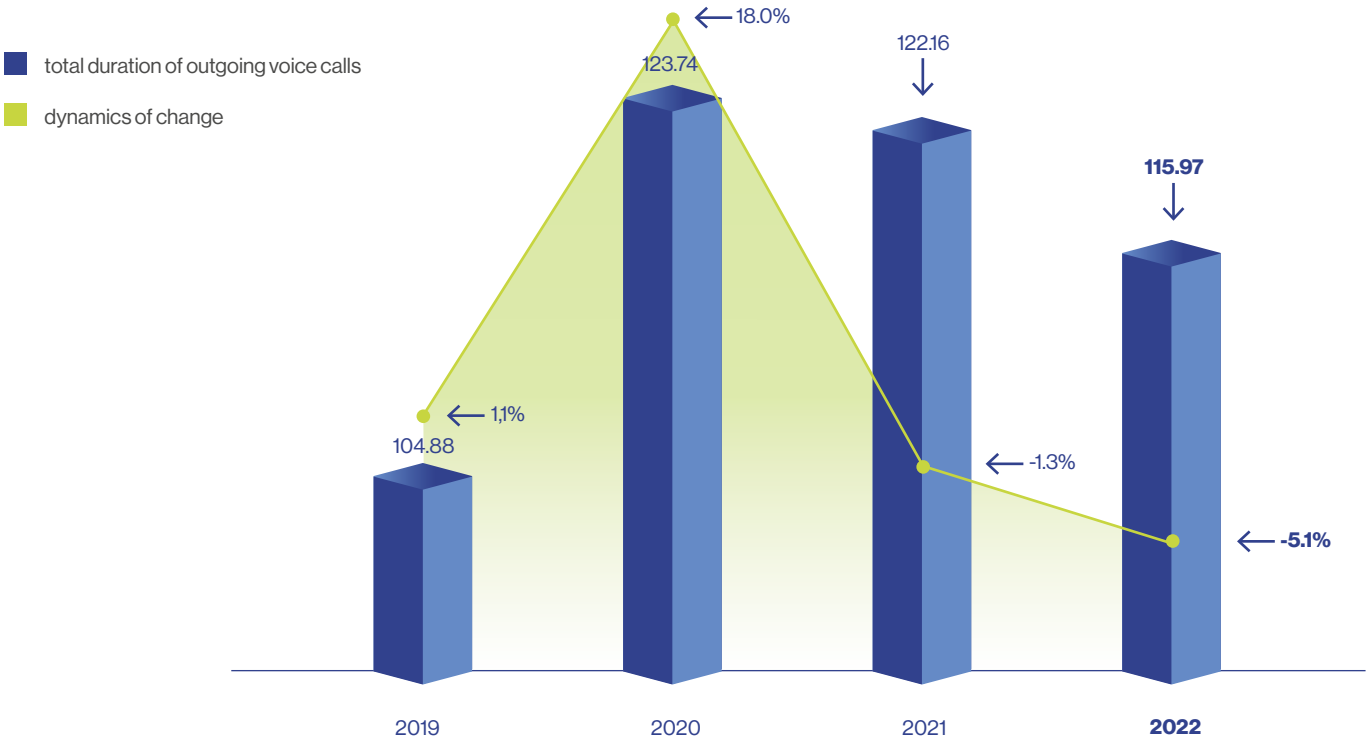
3.1.1.3 | Traffic volume

After a significant increase in total outbound call duration in 2020 (the effect of the SARS-CoV-2 pandemic), the trend decreased by 1.3% in 2021 and by another 5.1% in 2022. Mobile phone users made calls with a total duration of 115.97 billion minutes in 2022. Statistically, every Polish resident spent 3066 minutes on mobile phone calls per year, which was a decrease of 144 minutes compared to 2021. The average Pole spent 4.26 hours on phone calls per month.

Total call duration

116 billion minutes

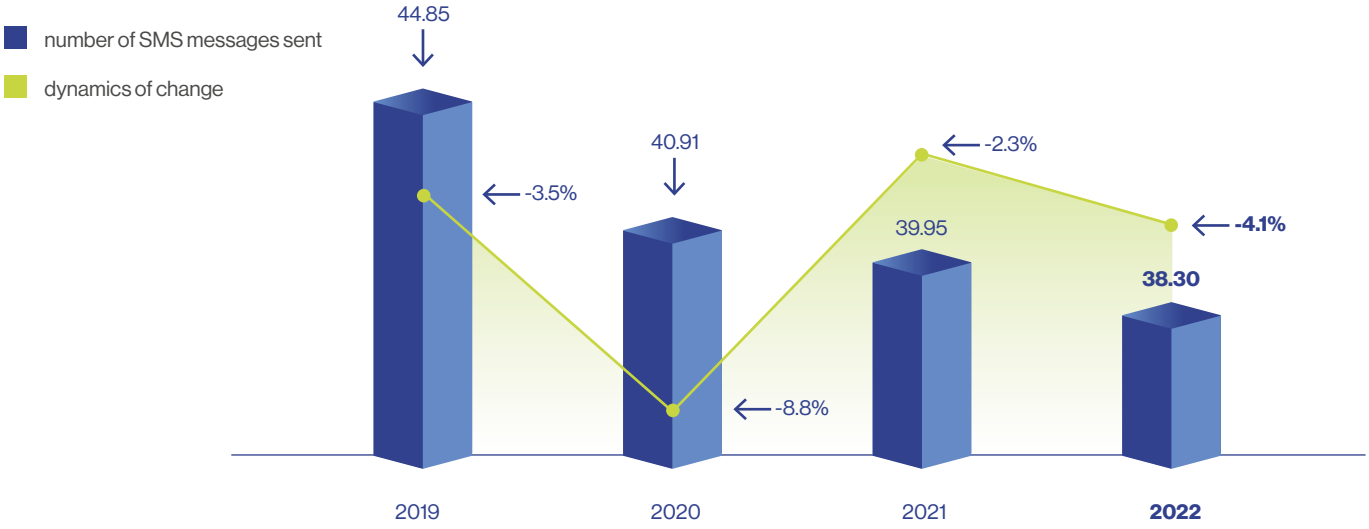
Figure 12
Total duration of outgoing voice calls (billion minutes) and dynamics of change



Source: databases maintained by UKE on the basis of reporting under Article 7 of the Telecommunications Act

A total of 38.30 billion text messages were sent in 2022, down by 4.1% compared to the previous year. Last year, statistically, every Pole sent 84 text messages per month, which was 3 messages fewer than in 2021. The decline in interest in the SMS messaging service has been observed for several years.
The service of traditional SMS messages is being replaced by messages sent using instant messaging or Internet services.

Figure 13
Total number of SMS messages sent (billion) and dynamics of change

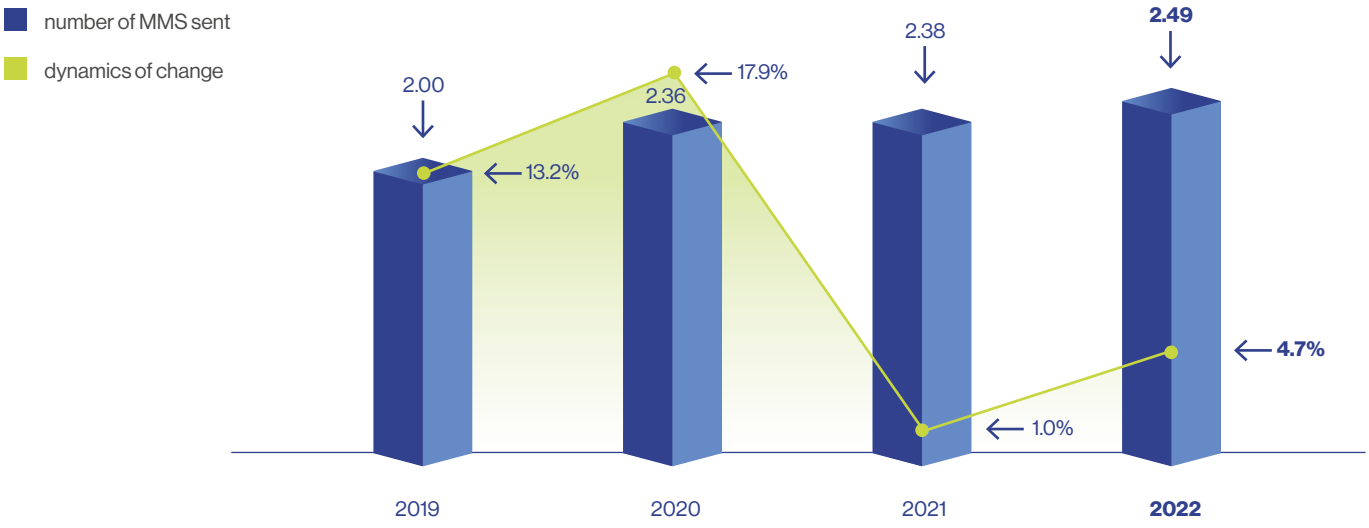


Source: databases maintained by UKE on the basis of reporting under Article 7 of the Telecommunications Act

In 2022, users sent 2.49 million MMS messages, a 4.7% increase compared to 2021.

The average of 5 MMS per month per Polish resident was maintained.

Figure 14
The number of MMS messages sent (millions) and dynamics of change



Source: databases maintained by UKE on the basis of reporting under Article 7 of the Telecommunications Act

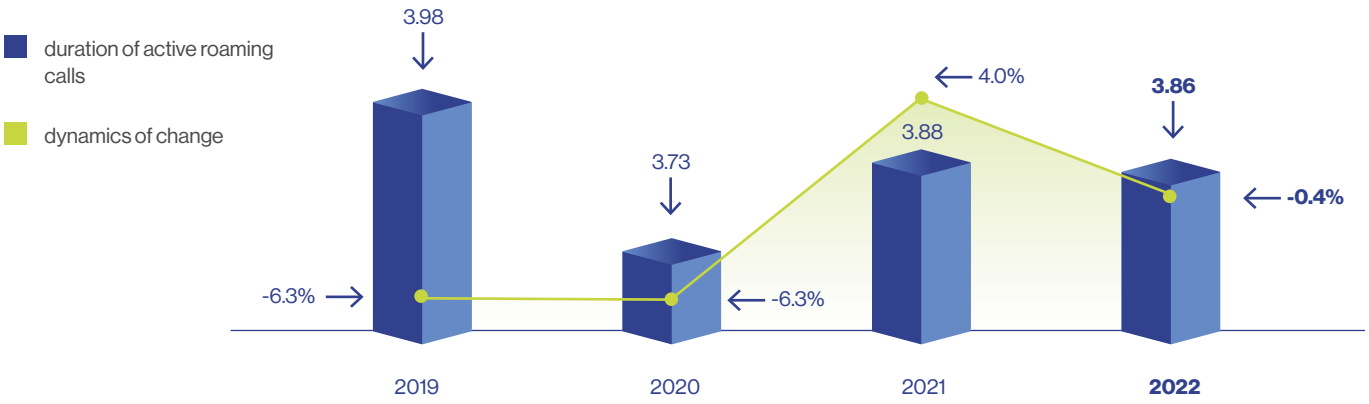
There is a steady increase in interest in the type of services that provide RCS messaging[8]. First RCS messages were sent in 2020. The data available to UKE indicate a 23% increase in 2022 compared to 2021. Operators dynamically expanded the service by sending 271.89 million RCS messages in 2022.

3.1.1.4 | Roaming

After the SARS-CoV-2 pandemic, roaming services have returned to their pre-pandemic status.
In 2022, the total duration of outgoing active roaming voice calls was 3.86 billion minutes, just 0.4% less than the previous year.

3.9 billion min
of roaming voice calls

Figure 15
Total duration of outgoing voice calls in active roaming (billion minutes) and dynamics of change



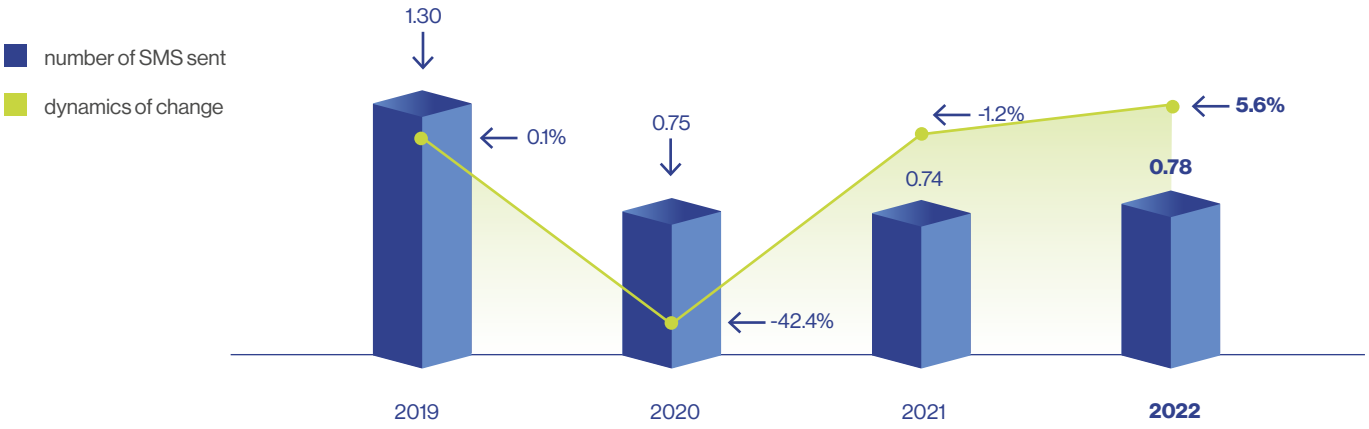
Source: databases maintained by UKE on the basis of reporting under Article 7 of the Telecommunications Act

[8] Rich Communication Services (RCS) text messaging allows users to send messages up to 100 MB, add good quality attachments in the form of video files, photos, voice messages, among others, as well as track current message status and share locations.

Subscribers to Polish mobile networks using roaming services sent 0.78 billion text messages in 2022, up 5.6% from a year earlier. The level of service appears to have reached stability at an even level.

0.78 billion SMS
sent while roaming

Figure 16
Total number of active roaming SMS messages sent (billion) and dynamics of change

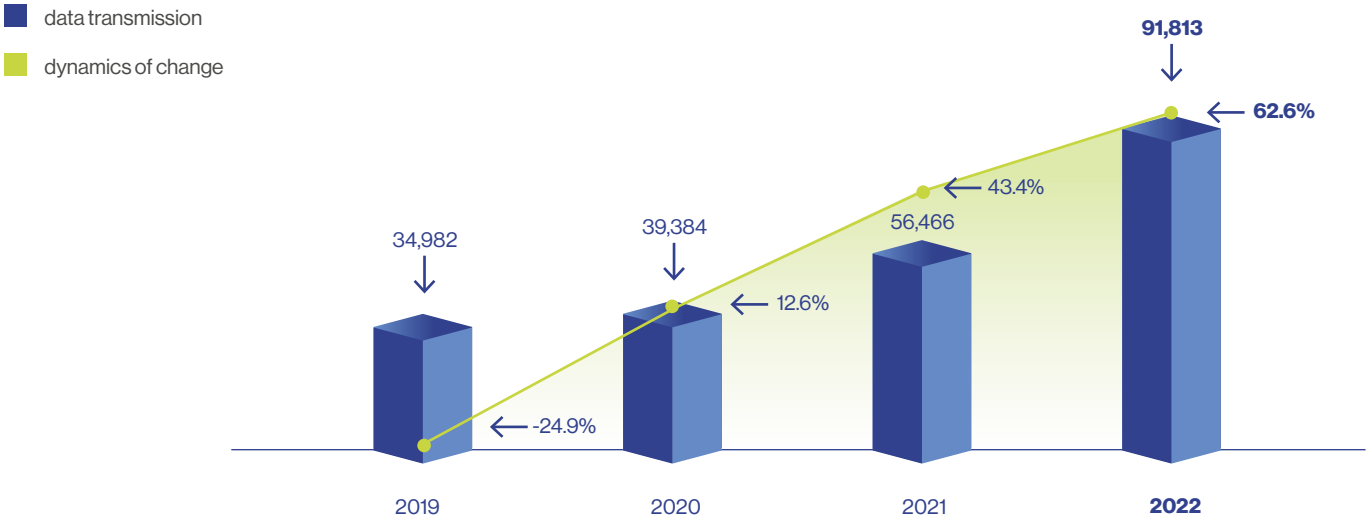


Source: databases maintained by UKE on the basis of reporting under Article 7 of the Telecommunications Act

The only roaming service that has improved and is steadily improving its pre-pandemic performance is data transmission. In 2022, users transferred 91,813 TB of data, an increase of 62.6% year-on-year.

63% increase in data roaming

Figure 17
Total data transmission volume in active roaming (TB)



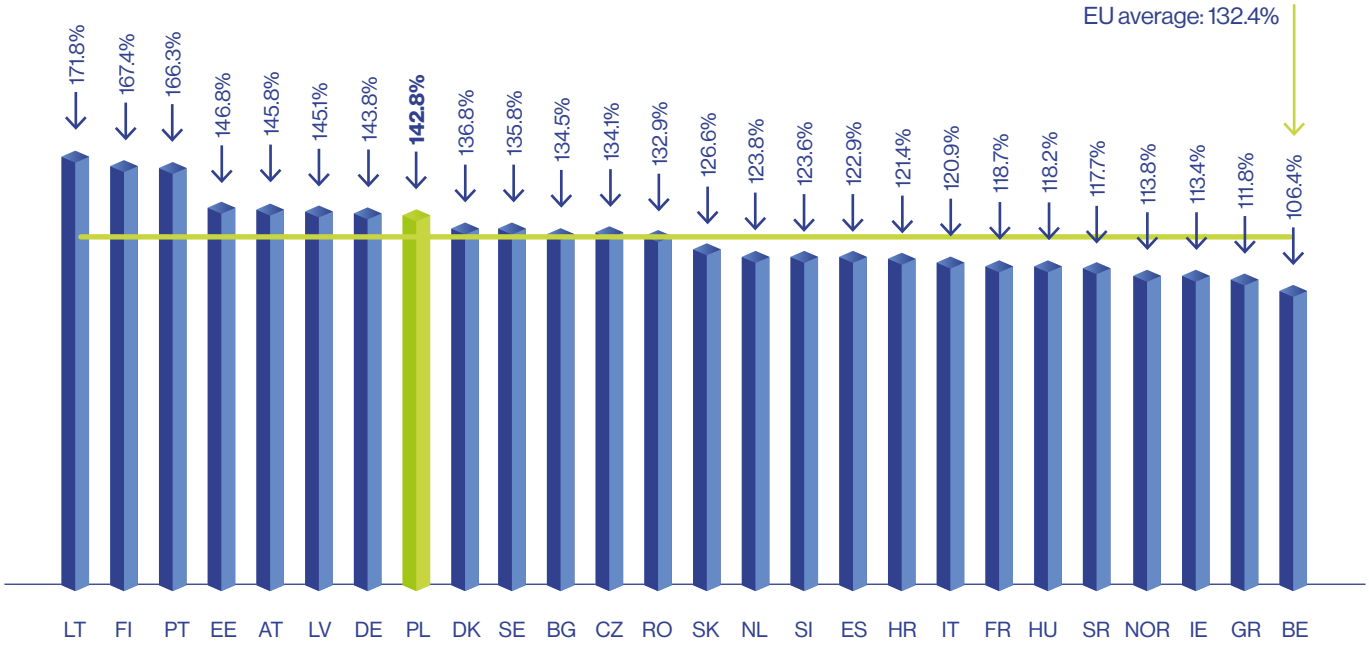
Source: databases maintained by UKE on the basis of reporting under Article 7 of the Telecommunications Act

3.1.1.5 | Comparison with European countries

According to Analysys Mason data, the average penetration of mobile telephony services in the European Union countries reached 132.4% in 2022. For Poland, the penetration rate of mobile telephony services was above the EU average at 142.8%.

There was no change last year in the top three EU countries with the highest penetration rates. The highest service penetration was listed for Lithuania (171.8%), followed by Finland (167.4%). Portugal ranked third (166.3%).

Figure 18
Penetration of mobile telephony services in selected European countries

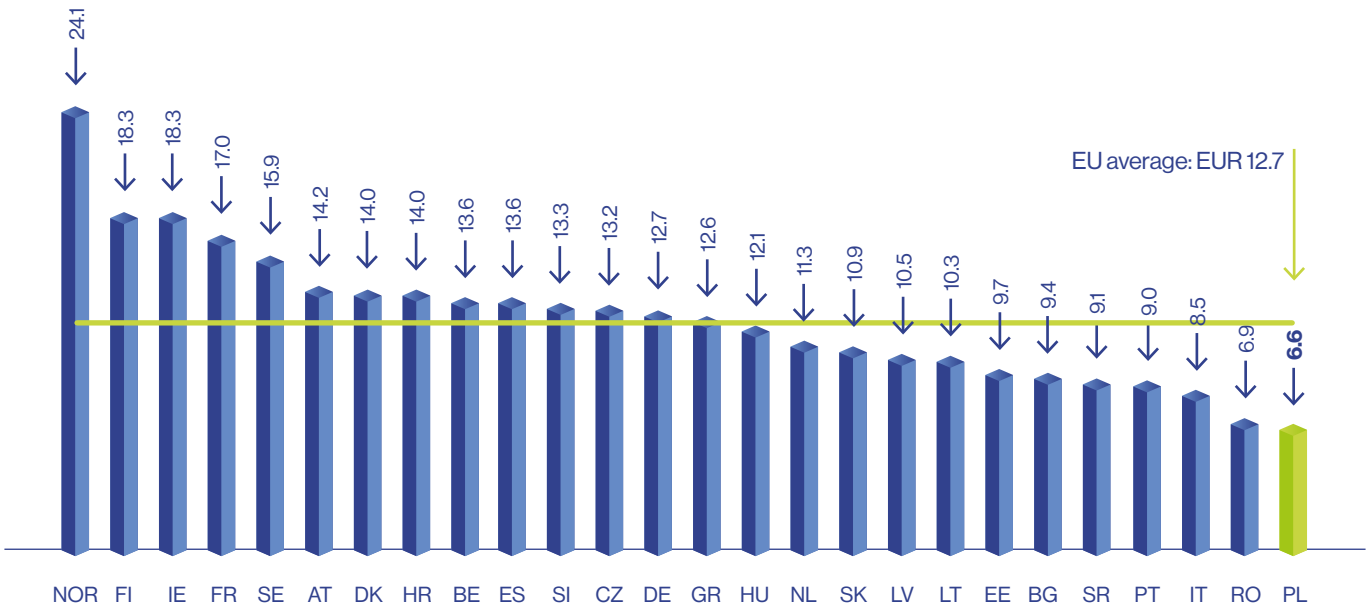


Source: DataHub database[9] maintained by Analysys Mason
The methodology adopted by Analysys Mason differs from that of UKE, hence there are differences between the calculations.

[9] Analysys Mason's DataHub database is a source of quarterly KPIs and metrics for assessing European fixed and mobile telephony markets, as well as market shares of major players.

A breakdown of average monthly revenue per user of mobile services shows an average of EUR 12.65 per month for selected European Union countries. According to the breakdown, Poland is the country that has the lowest average monthly revenue per user, EUR 6.02 below the EU average. Norway (EUR 24.11), Finland (EUR 18.30) and Ireland (EUR 18.27) have the highest ARPU.

Figure 19
Average monthly revenue per subscriber in selected European countries (EUR with VAT)

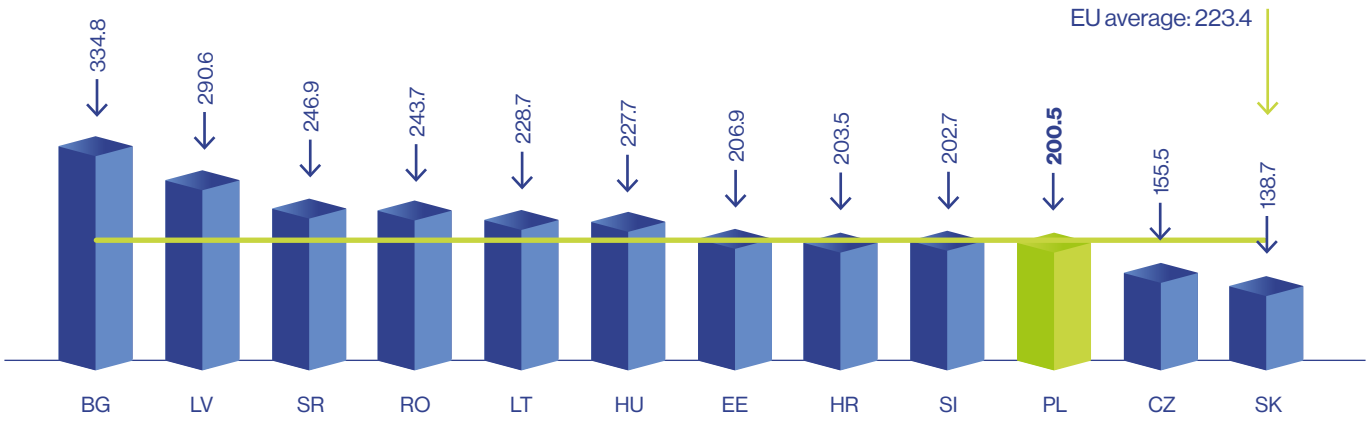


Source: the DataHub database maintained by Analysys Mason
The methodology adopted by Analysys Mason differs from that of UKE, hence the differences between the calculations. The above figures do not include IoT cards.

The average duration of voice calls per active user per month in 2022 in Poland was 200 minutes (no change year-on-year), which positions our country below values for the European Union.

According to data presented by Analysys Mason, subscribers in Bulgaria (334.80 minutes), Lithuania (290.58 minutes) and Serbia (246.90 minutes) are the most active.

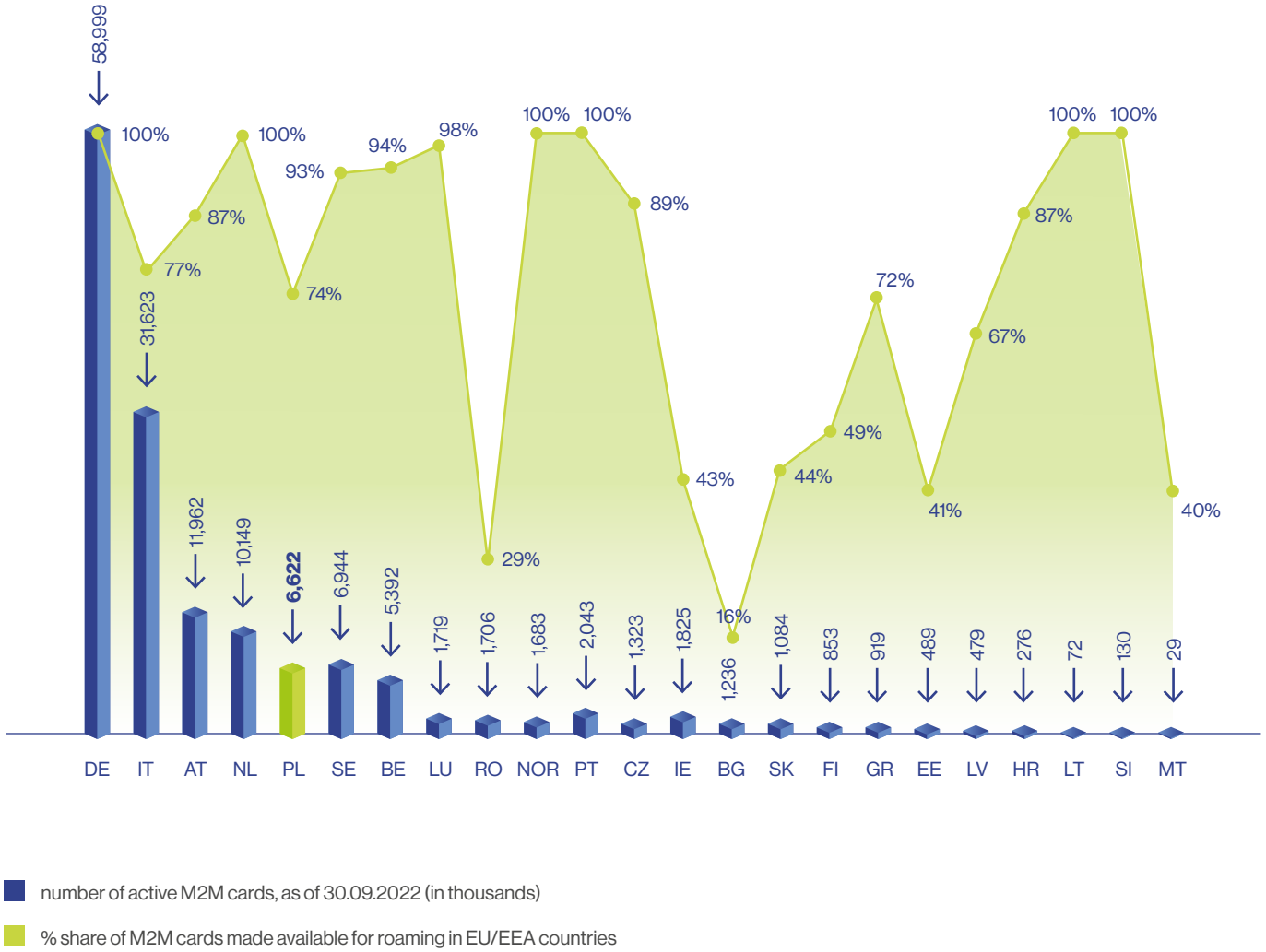
Figure 20
Average duration of voice calls per active user per month in selected EU countries (minutes)



Source: the DataHub database maintained by Analysys Mason
The methodology adopted by Analysys Mason differs from that of UKE, hence the differences between the calculations.

According to BEREC[10] data, the share of active M2M cards made available for roaming in European Union and European Economic Area countries is by far the most prevalent in Europe.
In Denmark, the Netherlands, Norway, Portugal, Slovenia and Lithuania, 100% of the reported active M2M cards are those made available for roaming in EU/EEA countries. Bulgaria, on the other hand, has the highest percentage of active M2M cards, where it is necessary to activate roaming access in EU/EEA countries (this access is not automatically activated). Among the total number of active M2M cards, those requiring activation of roaming services in EU/EEA countries account for 74%. Poland achieved a score equal to the European average in this comparison.

Figure 21
Number of active roaming M2M cards (in thousands) and share of M2M cards made available for roaming in EU/EEA countries



number of active M2M cards, as of 30.09.2022 (in thousands)

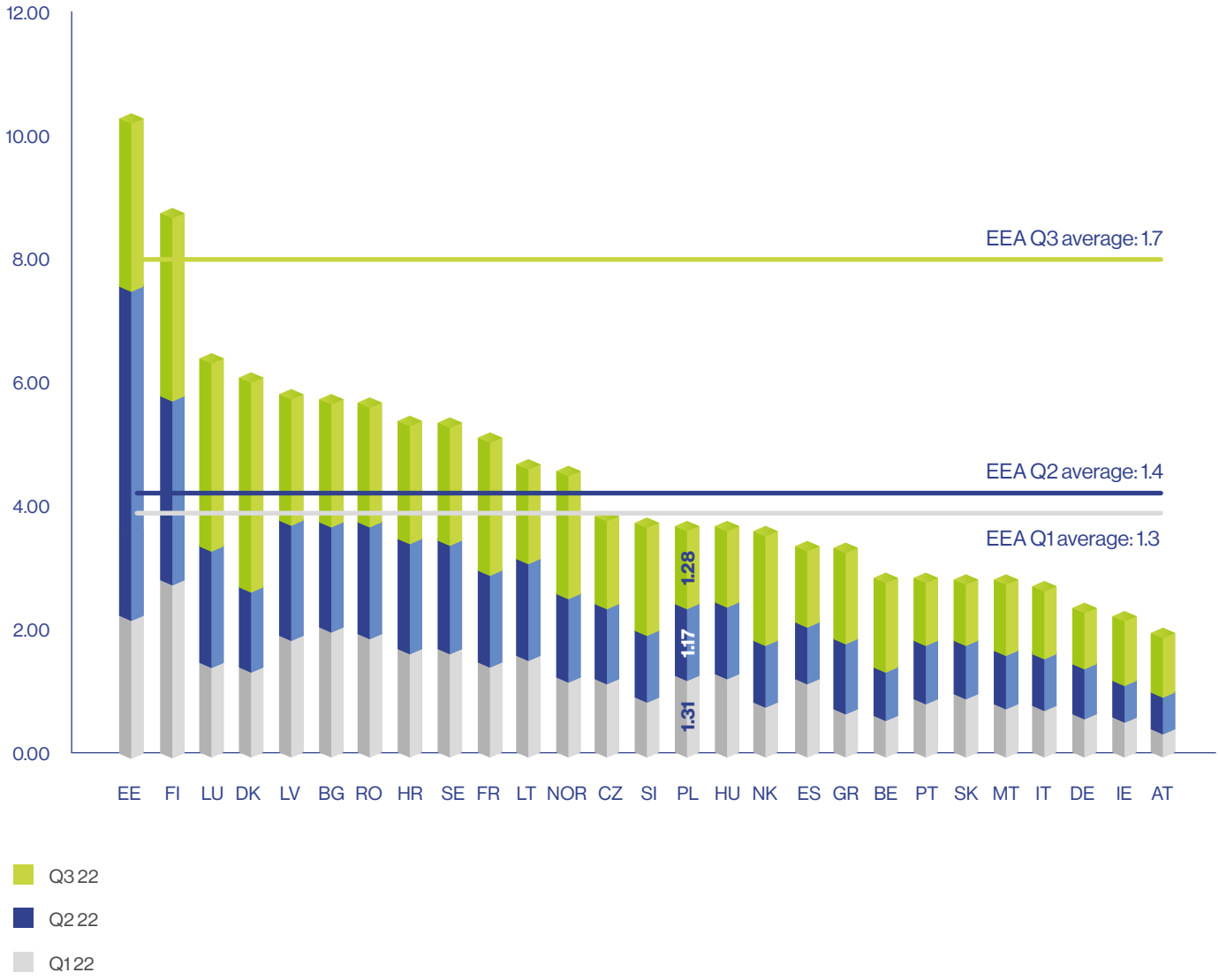
% share of M2M cards made available for roaming in EU/EEA countries

Source: UKE based on BEREC, BoR (23) 61 29th BEREC International Roaming Benchmark Data Report

[10] BEREC (Body of European Regulators for Electronic Communications) is the European Union's agency assisting in the task of ensuring consistent implementation of the European regulatory framework for electronic communications.

Average data roaming per user per month was highest in Estonia. Users there transferred an average of 3.64 GB of data per month (per user). A subscriber from Poland sent an average of 1.31 GB of data per month while roaming. The cross-section of data by country and the EEA average is fairly evenly distributed for each of the 2022 quarters surveyed. The most data was uploaded in the third quarter of the year (EEA average of 1.7 GB)[11].

Figure 22
Data roaming - average amount of data transferred (GB) per month / number of users



Source: UKE based on BEREC, BoR (23) 61 29th BEREC International Roaming Benchmark Data Report

[11] Data taken from the 29th report on international roaming, prepared by BEREC) based on information provided by member countries. According to the methodology adopted by BEREC, an active M2M card is one in which the mobile services assigned to the card were consumed at least once during a certain period of time (quarter), or if the M2M card was connected to the network and ready to perform the tasks assigned to it. The definition includes GPS navigation, data transfer between two devices, etc. SIM cards with only voice services or only data packet that are not sold as M2M services are excluded from the definition. SIM cards made available for roaming in EU/EEA countries are those that are able to use roaming services in EU/EEA countries (while in those countries) without having to intentionally activate this service.

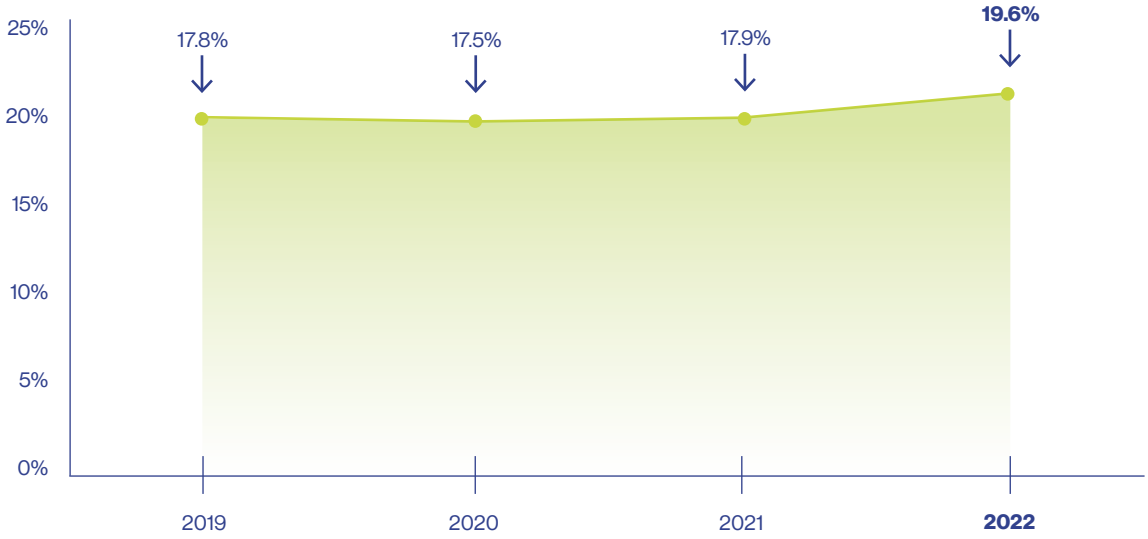
3.1.2 | VoIP telephony service

3.1.2.1 | General Information

The trend of displacing traditional fixed calls by cheaper VoIP services continued in 2022. Phone calls via VoIP were used by 54% of total fixed telephony users[12] compared to 49% in the previous year.

The penetration of VoIP service, defined as the number of users per total number of households in Poland, has increased for another year in a row. In 2022, 19.6% of the population had VoIP phone services, 1.7 percentage points up compared to the previous year.

Figure 23
Penetration of the VoIP telephony market



Source: databases maintained by UKE on the basis of reporting under Article 7 of the Telecommunications Act

[12] Total fixed telephony includes traditional fixed telephony and VoIP telephony

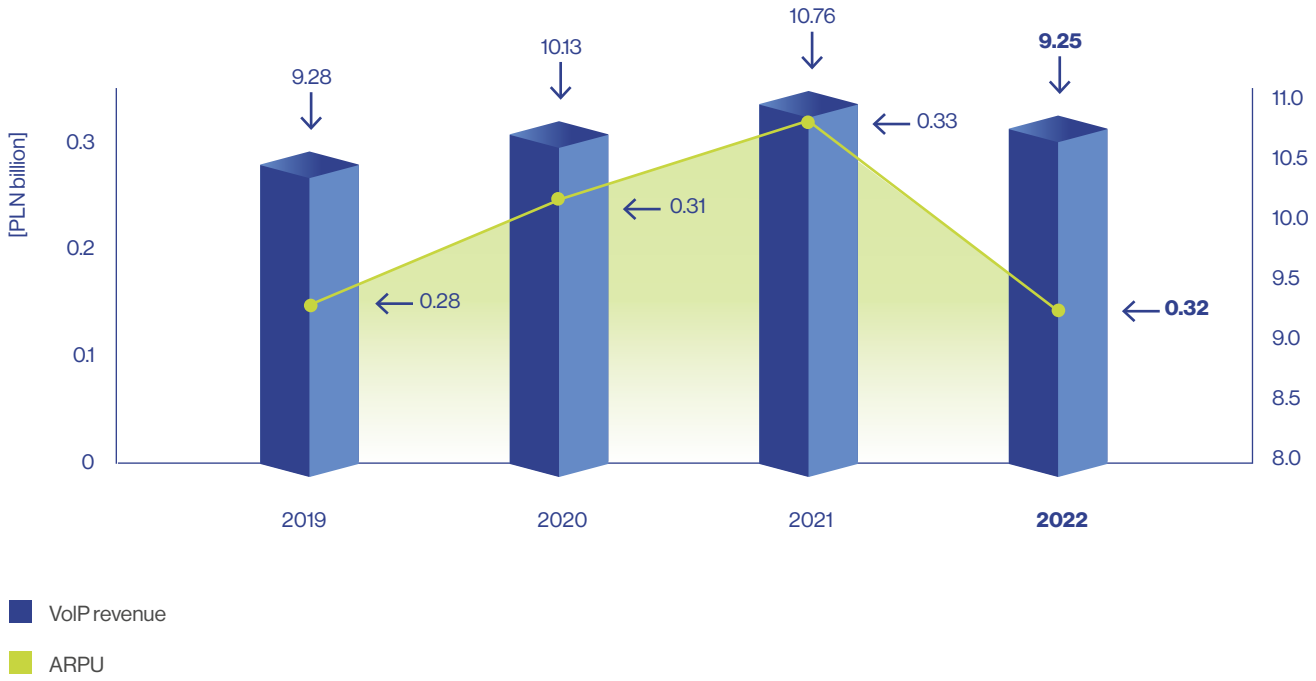
3.1.2.2 | Revenues

In 2022, after years of growth, the value of the VoIP telephony services market declined by 5.5% to PLN 0.32 billion. Along with the decline in revenue, the average monthly revenue per user decreased, amounting to PLN 9.25 (down by 14%). In the structure of total fixed telephony revenues, VoIP service revenues accounted for 22.8% in 2022.

PLN 0.32 billion

the value of the VoIP telephony market

Figure 24
Value of the VoIP telephony market (billion PLN) and average monthly revenue per subscriber (ARPU in PLN)

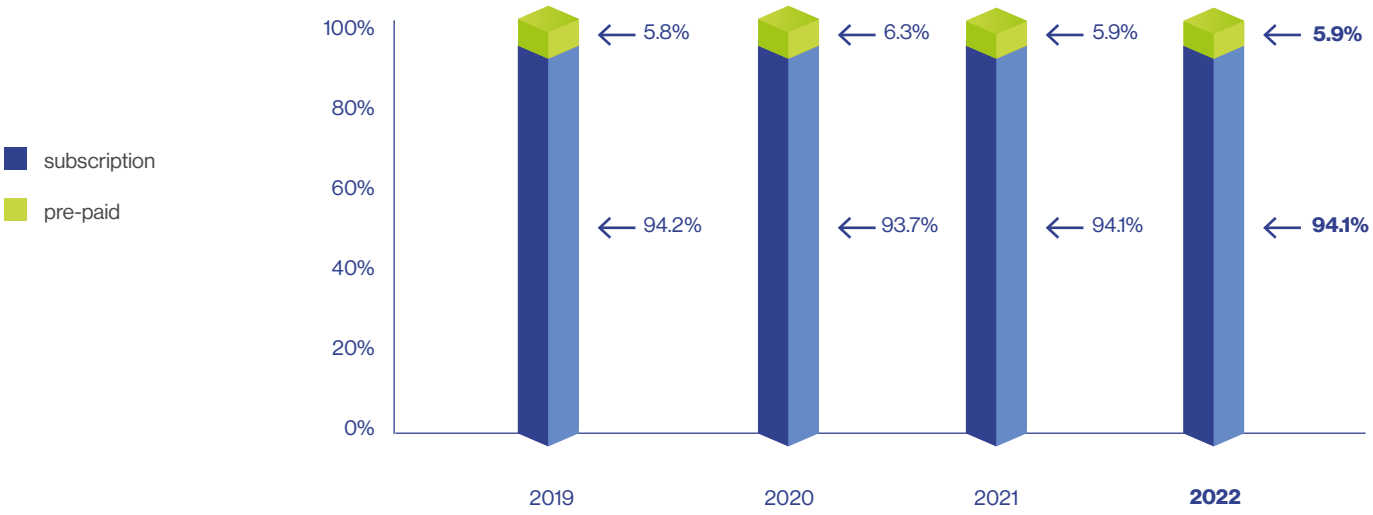


Source: databases maintained by UKE on the basis of reporting under Article 7 of the Telecommunications Act

The main source of VoIP telephony revenue for years have been subscription contracts, which accounted for 94.1% of total VoIP revenue in 2022, as they did a year earlier. Prepaid revenue is 5.9% of total VoIP revenue.

94.1% subscription share in VoIP revenue

Figure 25
Subscription and pre-paid share in VoIP telephony revenue

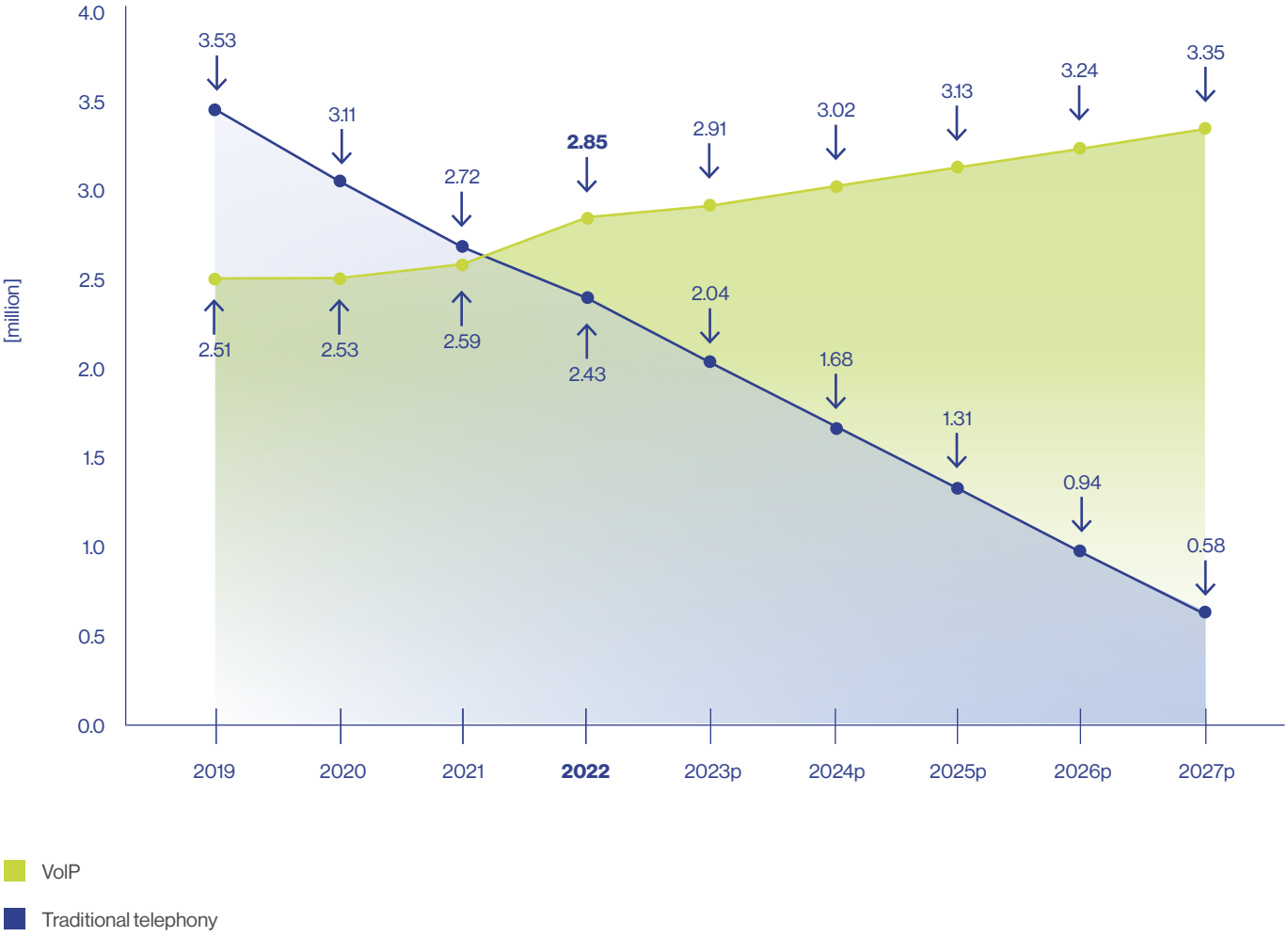


Source: databases maintained by UKE on the basis of reporting under Article 7 of the Telecommunications Act

3.1.2.3 | Users

In 2022, 2.85 million users used VoIP. In the last year, the number of users of this type of connection has increased by 10% over 2021. It is estimated that the number of users of this technology will continue to increase. According to UKE estimates, the number of VoIP customers could reach as many as 3.35 million in 2027. Average annual user growth is assumed to be 3.6%.

Figure 26
Number of VoIP and traditional telephony users with forecasts

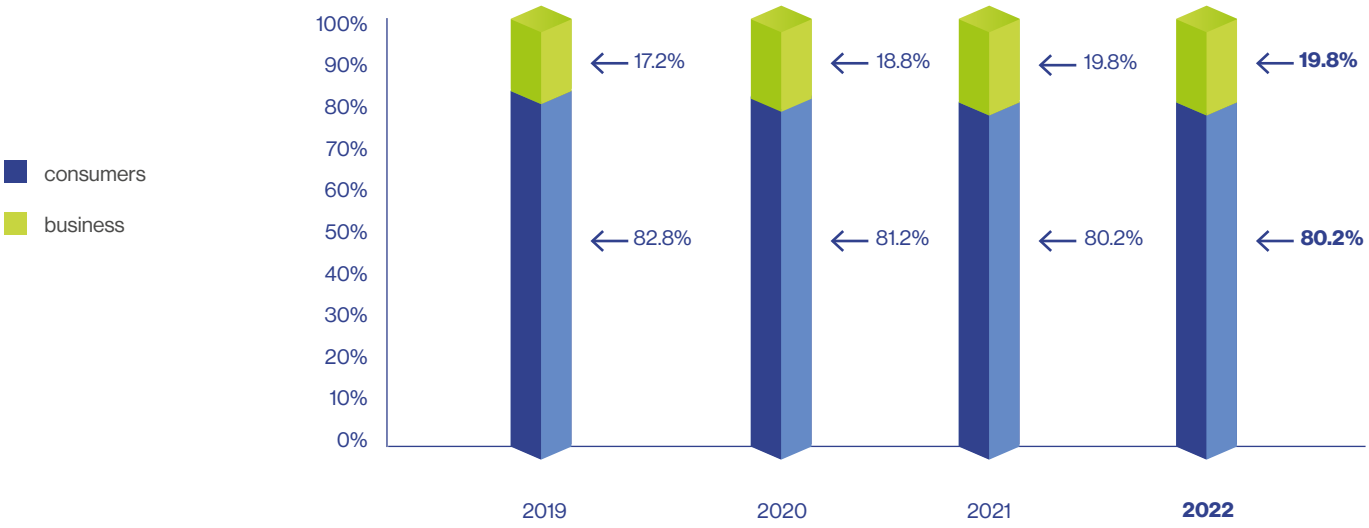


Source: databases maintained by UKE on the basis of reporting under Article 7 of the Telecommunications Act

VoIP telephony is used primarily by residential users, who accounted for 80.2% of total VoIP users in 2022, just as in 2021. Both the consumer and business segments saw a 10% year-on-year increase.

2.8 million
of VoIP users

Figure 27
Share of consumers and business in the number of VoIP telephony users

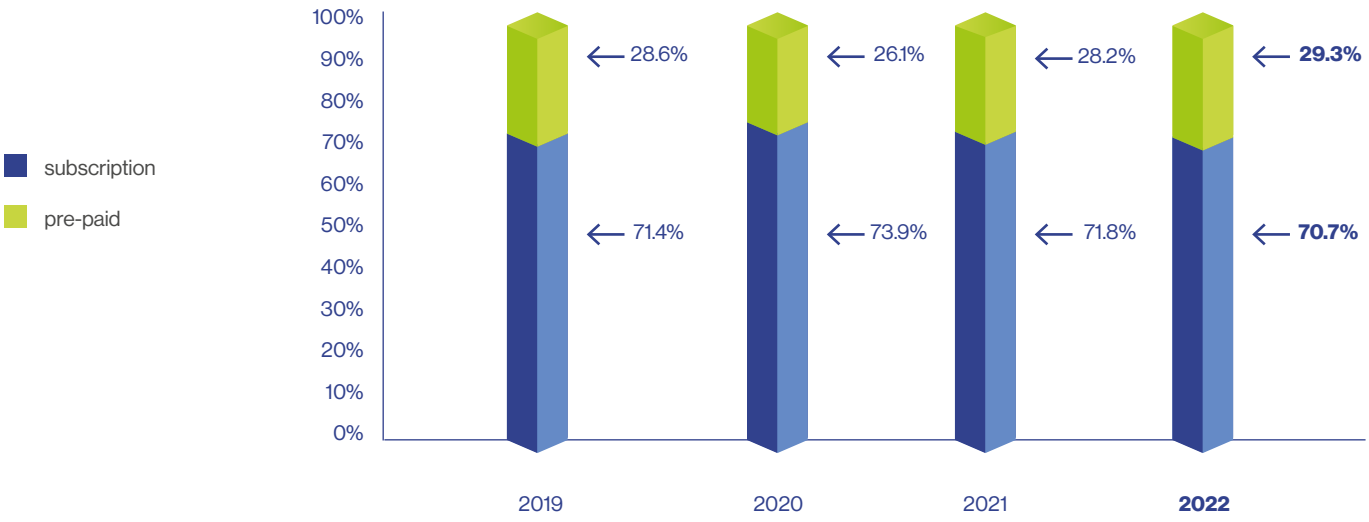


Source: databases maintained by UKE on the basis of reporting under Article 7 of the Telecommunications Act

In 2022, subscription services still accounted for the vast majority (70.7%) of services provided via VoIP technology given the number of users. However, there is clearly an increase in prepaid services in the structure of such calls.

80.2 %
VoIP individual customers

Figure 28
Share of subscription and prepaid in the number of VoIP users



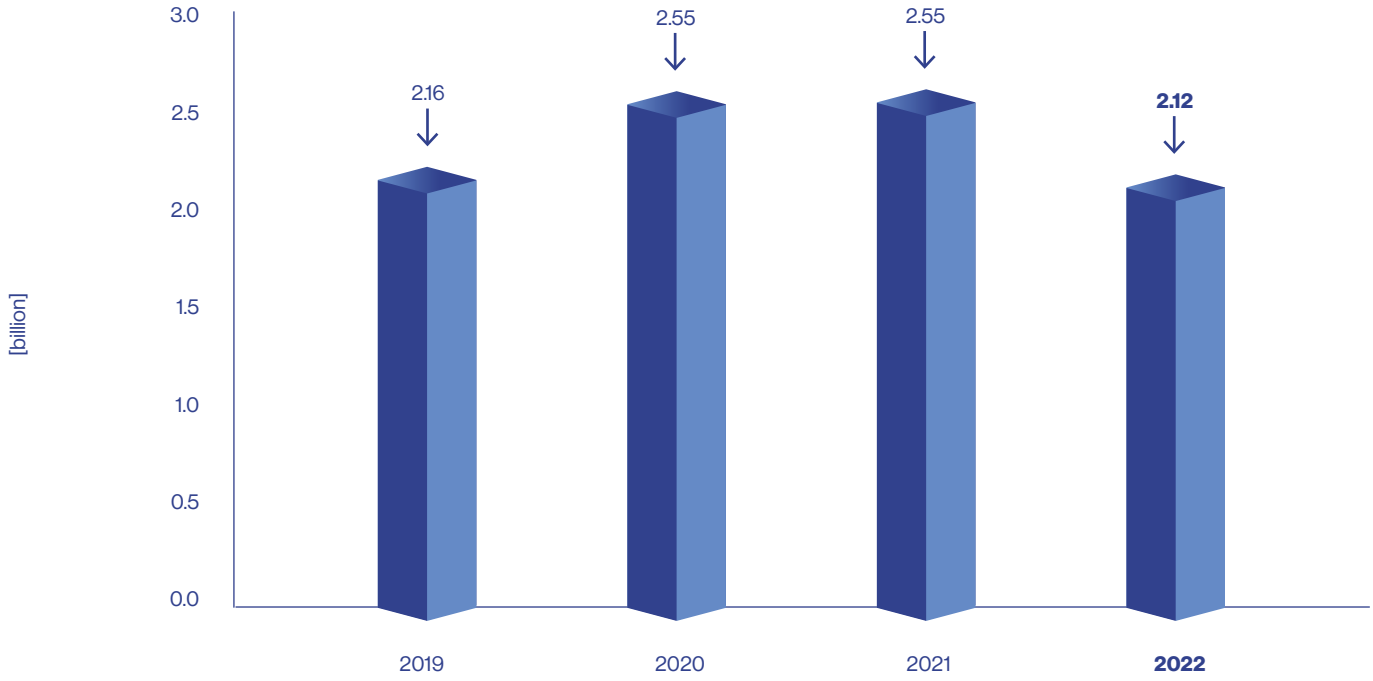
Source: databases maintained by UKE on the basis of reporting under Article 7 of the Telecommunications Act

3.1.2.4 | Traffic volume

The volume of VoIP traffic in 2022 was 2.12 billion minutes, down by 17% compared to the previous year. After a fairly significant increase in the volume of VoIP traffic during the COVID-19 pandemic in 2020, VoIP traffic is returning to pre-pandemic levels.

2.1 billion
VoIP call minutes

Figure 29
VoIP traffic volume



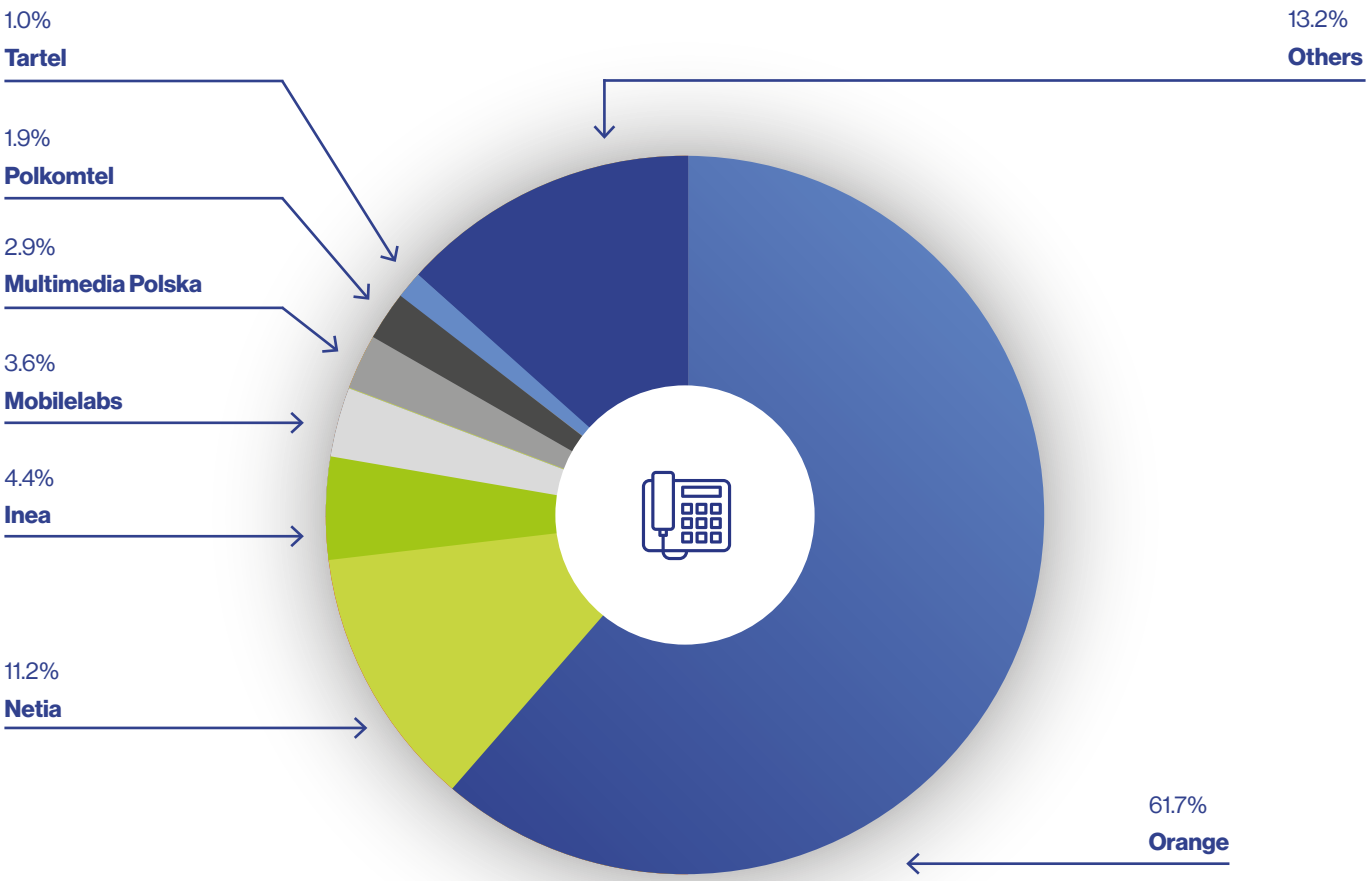
Source: databases maintained by UKE on the basis of reporting under Article 7 of the Telecommunications Act

3.1.2.5 | Structure broken down by entities

Orange Polska held the largest share in the post-paid VoIP market in 2022, on which 639 operators were present. Similarly to the previous year, Orange provided services to 61.7% of customers in this market segment. Netia, which ranked second, provided subscription VoIP service to 11.2% of customers (down by 0.4 percentage points).

Shares of Inea and Mobilelabs increased (by 1.9 percentage points and 1.3 percentage points, respectively), while those of Multimedia Polska, Polkomtel and Tartel declined. The shares of other players with less than 1% of users also declined.

Figure 30
Operators' shares of VoIP users (subscription) in 2022.

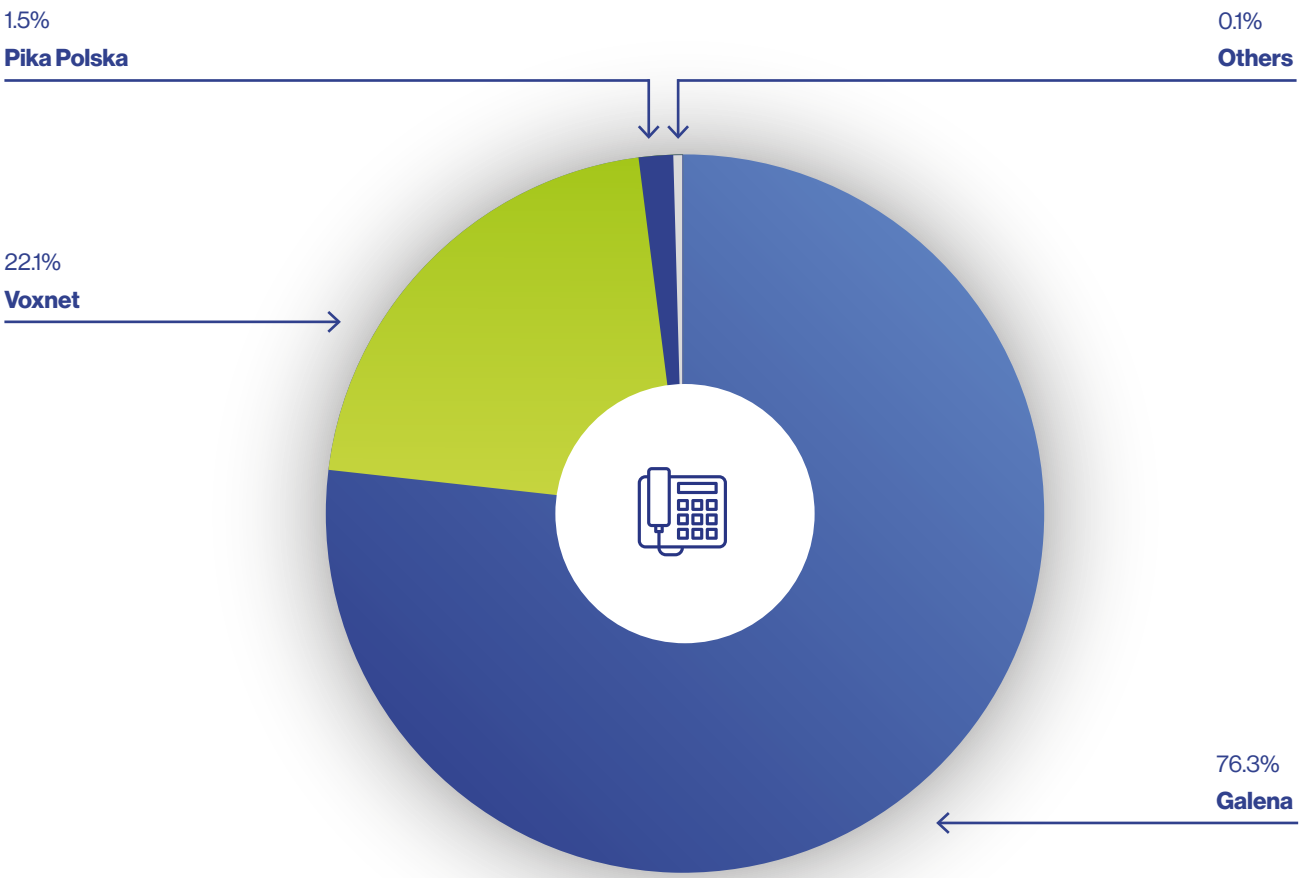


Source: databases maintained by UKE on the basis of reporting under Article 7 of the Telecommunications Act others – entrepreneurs with a unit share of less than 1%

In the pre-paid VoIP market in 2022, the service was provided by 14 entrepreneurs, of which only three achieved more than 1% market share. Galena had the largest number of users of prepaid VoIP services. Its share rose to 76.3%, i.e. by 14.5 percentage points. Voxnet is losing its share at a fairly rapid pace. In 2022, it provided the service to 22.1% of users, (a year-on-year decline of 14 percentage points), while two years earlier it was the market leader (49.6% share in 2020).

Third place in terms of the number of prepaid VoIP users went to PIKA, with a share of 1.5%, up 0.2 percentage points from a year earlier. The combined share of the other 11 players fell by 1.8 percentage points to 0.1%.

Figure 31
Operators' shares in the number of VoIP (pre-paid) users



Source: databases maintained by UKE on the basis of reporting under Article 7 of the Telecommunications Act others – entrepreneurs with a unit share of less than 1%

3.1.3 | Fixed telephony service

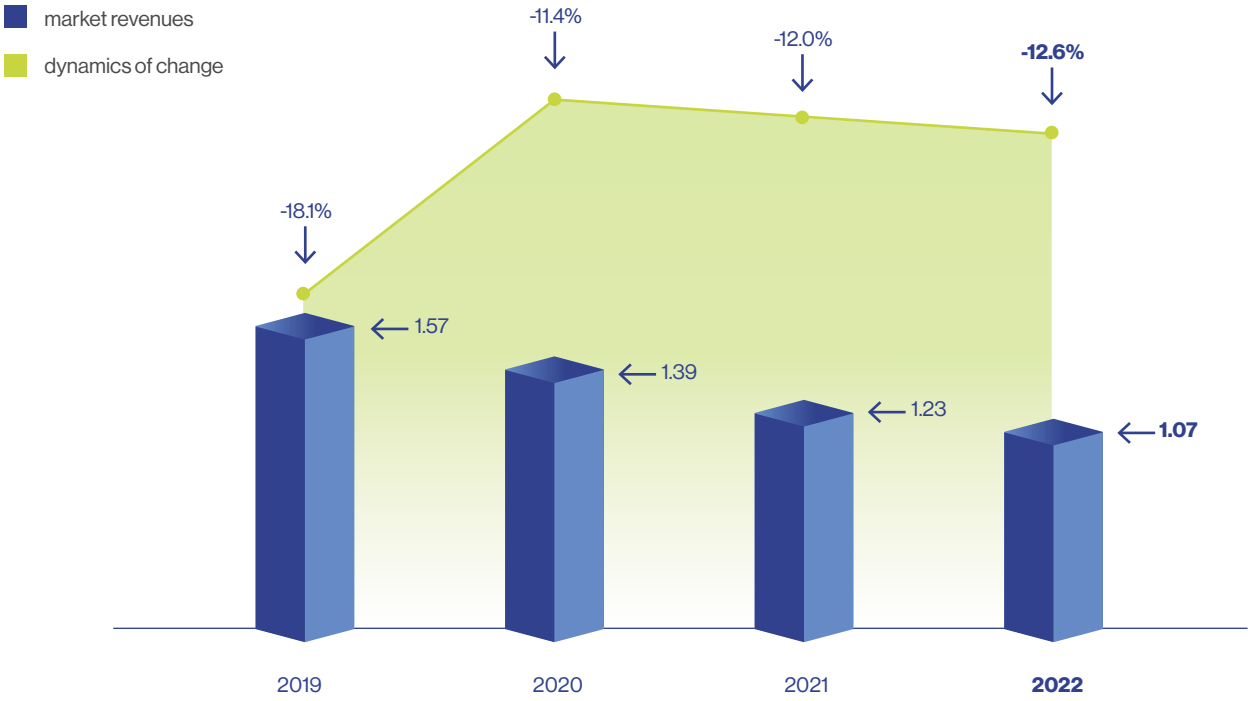
3.1.3.1 | General Information

In 2022, 2.43 million subscribers used fixed telephony services, down by 10.7% compared to the previous year. Revenues from the provision of telephone services amounted to PLN 1.07 billion, 12.6% less compared to 2021.

2.4 million – number of fixed telephony subscribers

PLN 1.1 billion – value of the service market of the fixed telephony

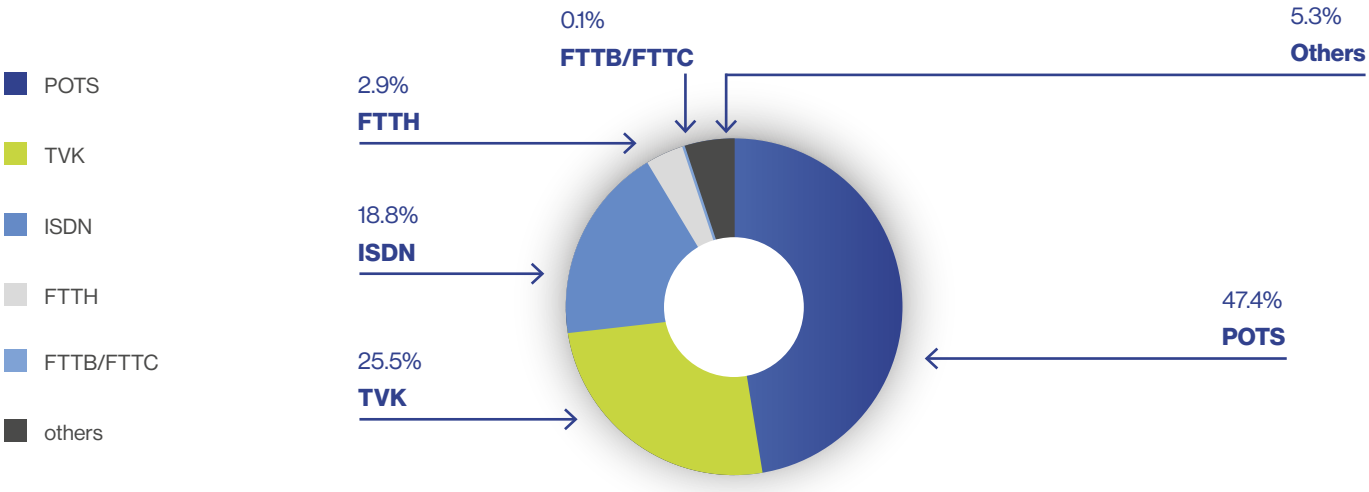
Figure 32
Value of the fixed telephony market (in billion PLN) and dynamics of change



Source: databases maintained by UKE on the basis of reporting under Article 7 of the Telecommunications Act

Less than half of the total number of own subscriber lines were POTS technology lines (47.4%). The second-largest share (25.5%) of the technology used to provide fixed telephony services was cable modem (TVK).
ISDN technology ranked third (18.8%). The share of other types of connections was 8.3%.

Figure 33
Percentage share of line types in the total share of subscriber lines by technology

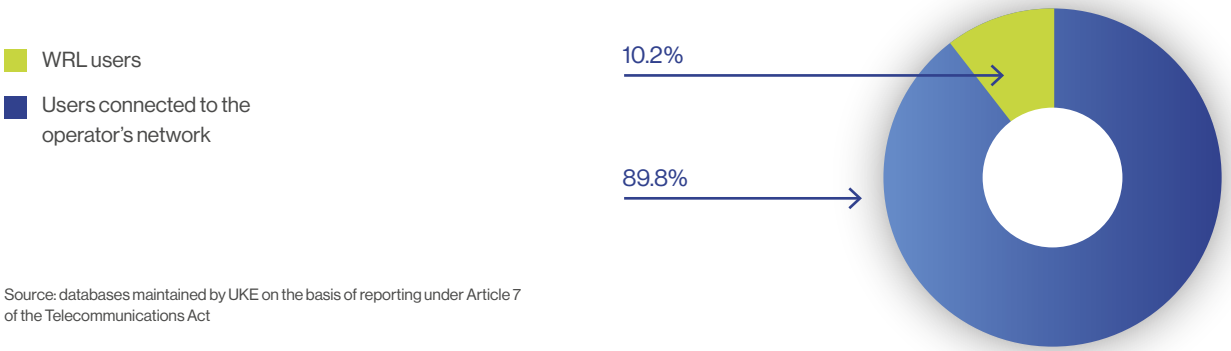


Source: databases maintained by UKE on the basis of reporting under Article 7 of the Telecommunications Act

3.1.3.2 | Revenues

In 2022, the value of the fixed telephony market in Poland was PLN 1.07 billion, down by 12.6% compared to the previous year. The main source of revenue for entrepreneurs providing fixed telephony services were subscribers connected to the operator's network (89.8%). 10.2% of total market revenue came from retail subscribers using wholesale network access (WLR[13]).

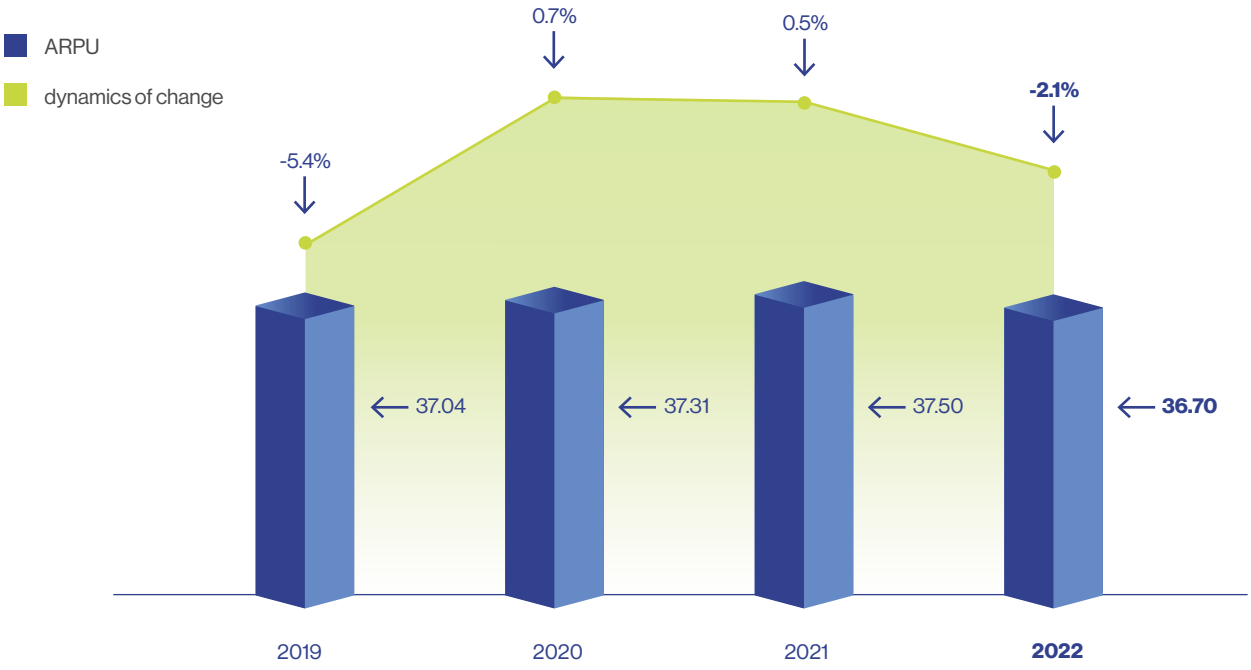
Figure 34
Revenue structure by type of subscriber lines in use



Source: databases maintained by UKE on the basis of reporting under Article 7 of the Telecommunications Act

In 2022, the average monthly revenue per subscriber (ARPU) of fixed telephony was PLN 36.70. Compared to 2021, the value decreased by PLN 0.80.

Figure 35
Average monthly revenue per subscriber (PLN) and dynamics of change



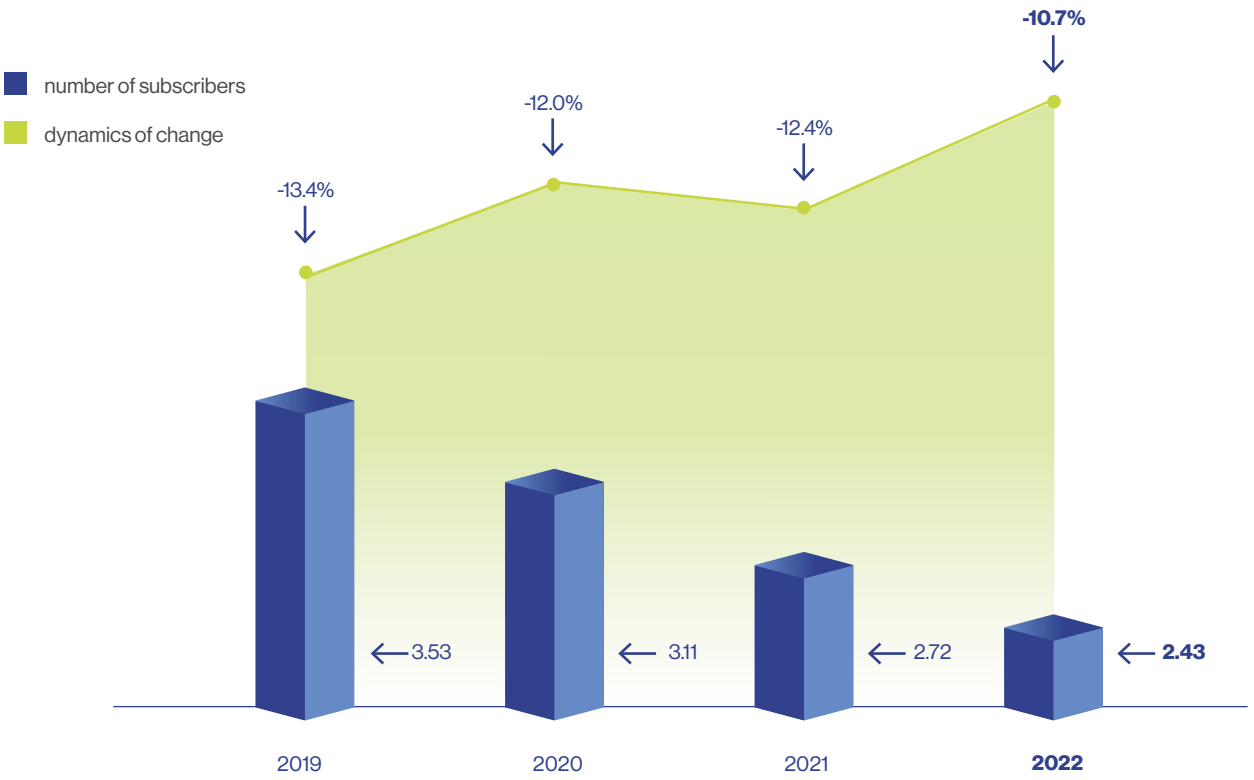
Source: databases maintained by UKE on the basis of reporting under Article 7 of the Telecommunications Act

[13] WLR – wholesale line rental

3.1.3.3 | Users

In 2022, the downward trend related to the number of fixed telephony subscribers continued; there were 2.43 million of them, down by 10.7% compared to the previous year.

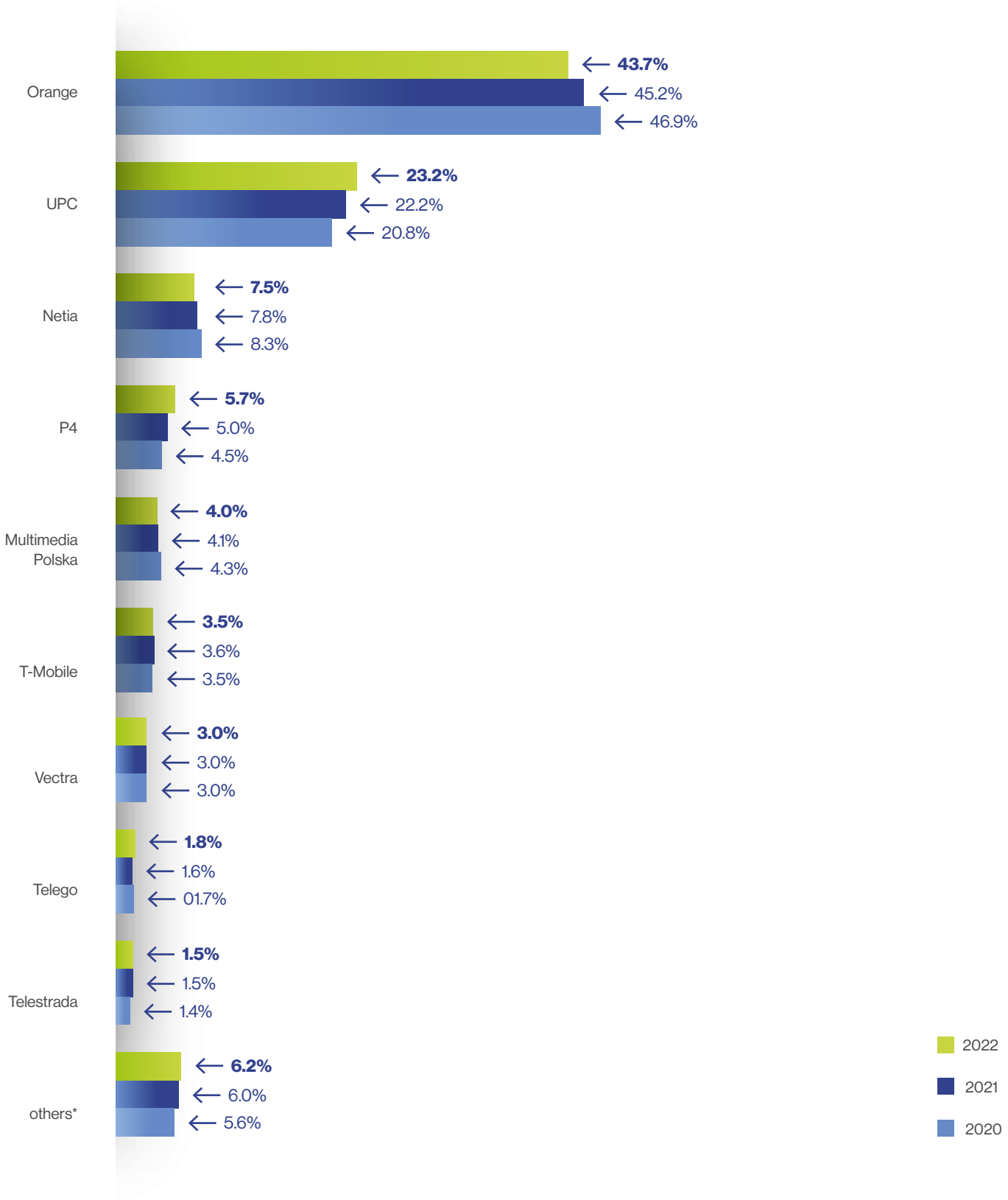
Figure 36
Number of fixed telephony subscribers (in millions) and the dynamics of change



Source: databases maintained by UKE on the basis of reporting under Article 7 of the Telecommunications Act

In 2022, just under half of the fixed telephony market share in terms of users was held by Orange (43.7%). UPC ranked second (23.2% - up 1.0 percentage point compared to the previous year), followed by Netia (7.5%), P4 (5.7% - up 0.7 percentage points) and Multimedia (4.0%), respectively. The share of other entrepreneurs was 6.2%.

Figure 37
Shares of operators by number of subscribers

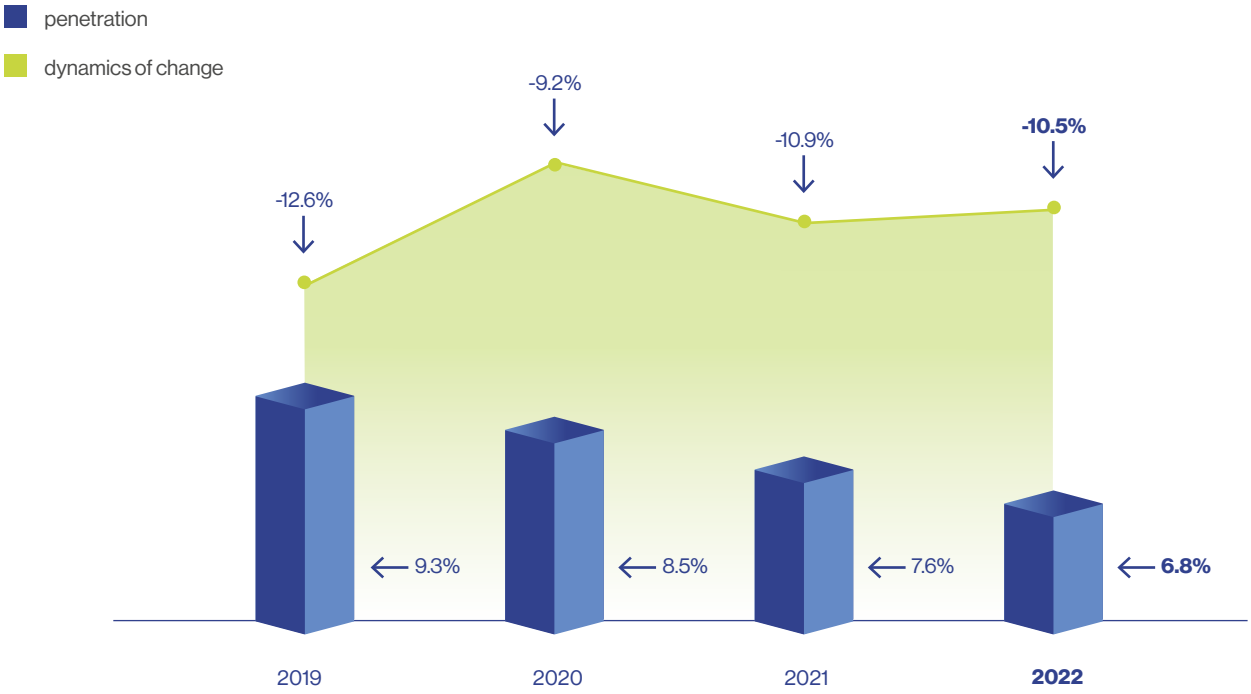


Source: databases maintained by UKE on the basis of reporting under Article 7 of the Telecommunications Act
* Others – entrepreneurs with a unit share of less than 1%

3.1.3.4 | Subscriber lines

In 2022, the penetration rate of fixed telephony services (lines)[14] for the country as a whole was 6.8%, down by 10.5% as compared to 2021.

Figure 38
Fixed line telephony penetration and dynamics of change

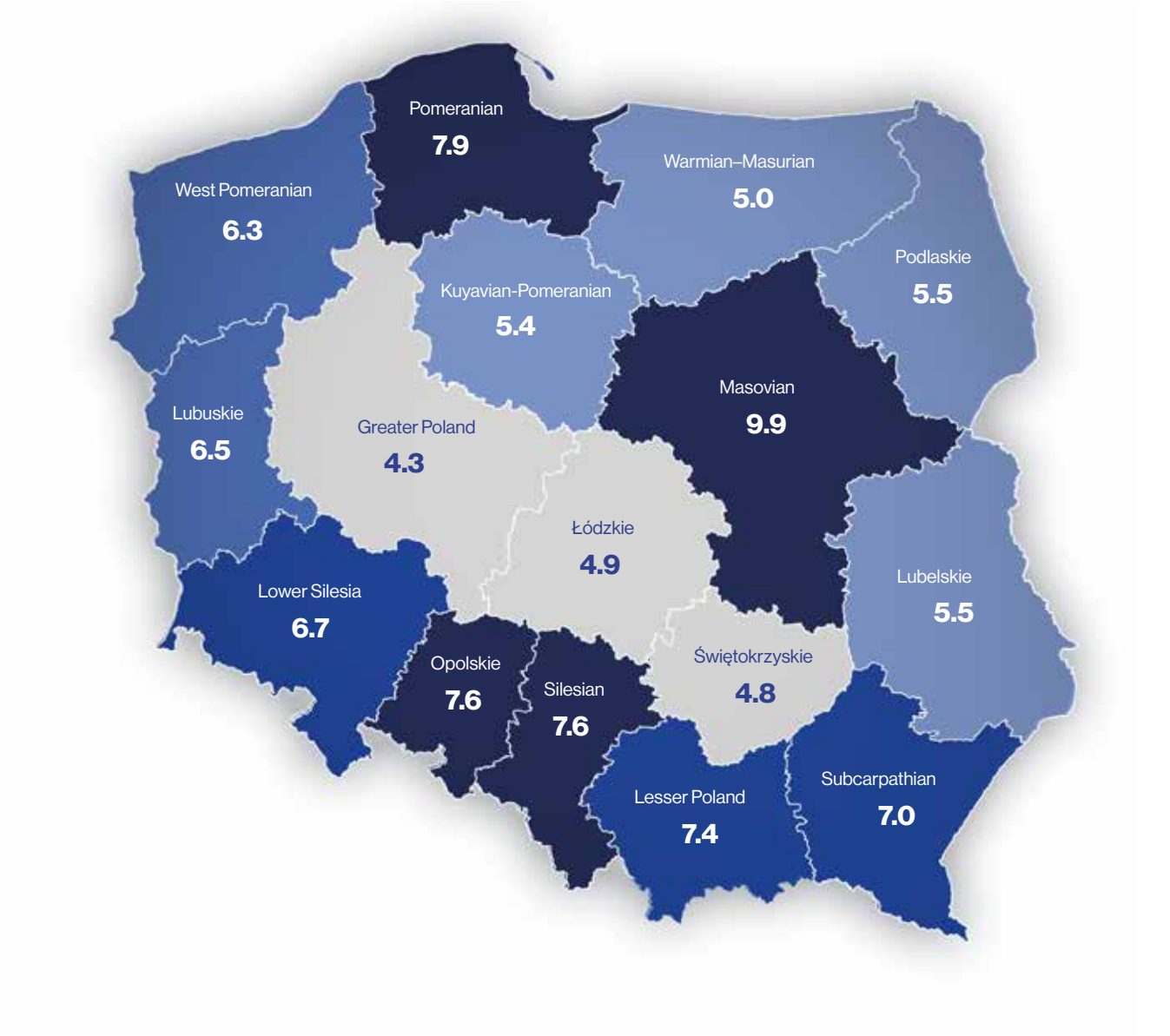


Source: databases maintained by UKE on the basis of reporting under Article 7 of the Telecommunications Act

[14] Penetration is calculated as the ratio of the number of fixed telephony subscriber lines to the population of Poland.

In 2022, the highest number of own subscriber lines per capita was in the Masovian Voivodeship (9.9%), while the lowest was in the Greater Poland Voivodeship (4.3%).

Figure 39
Penetration (in %) of fixed telephony lines by voivodeship



Source: databases maintained by UKE on the basis of reporting under Article 7 of the Telecommunications Act

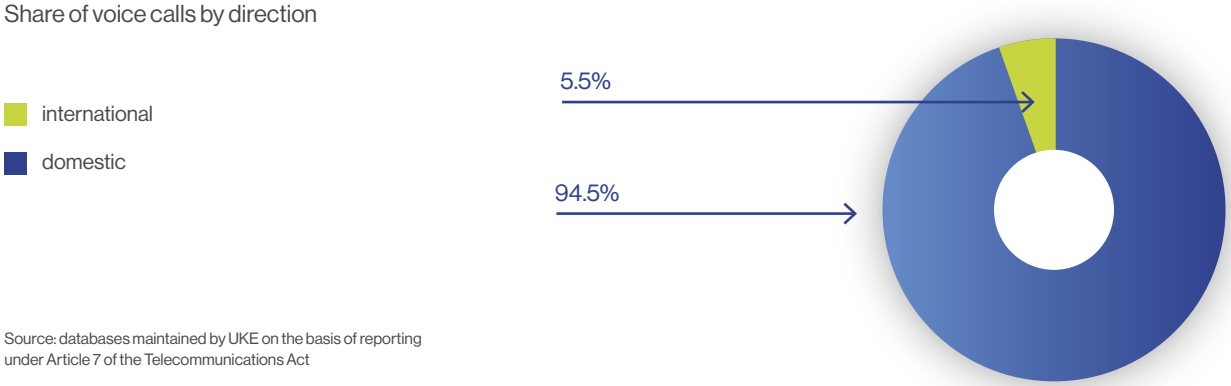
3.1.3.5 | Traffic volume

In 2022, a continuation of the downward trend in call duration from previous years was still evident. Total call duration was 3.05 billion minutes, down by 28.9% compared to the previous year. The continued decline in calls confirms the previous trend of decreasing telecommunications traffic in favour of other means of communication, including mobile telephony and instant messaging.

Largest share of traffic volume – domestic calls

94.5%

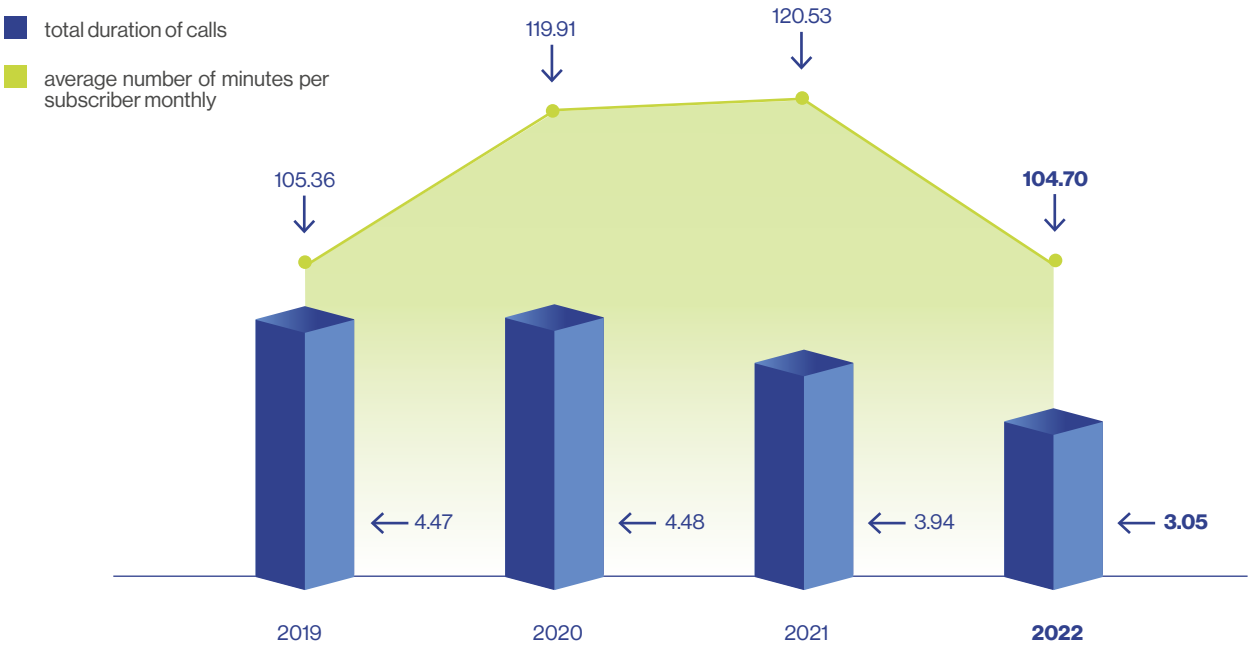
Figure 40
Share of voice calls by direction



Source: databases maintained by UKE on the basis of reporting under Article 7 of the Telecommunications Act

In 2022, the average number of minutes per subscriber decreased compared to 2021 by 16 minutes and amounted to 105 minutes per subscriber per month, i.e. the same as in 2019 before the outbreak of the COVID-19 pandemic in 2020.

Figure 41
Traffic volume (in billions of minutes) and the average number of minutes per subscriber monthly



Source: databases maintained by UKE on the basis of reporting under Article 7 of the Telecommunications Act

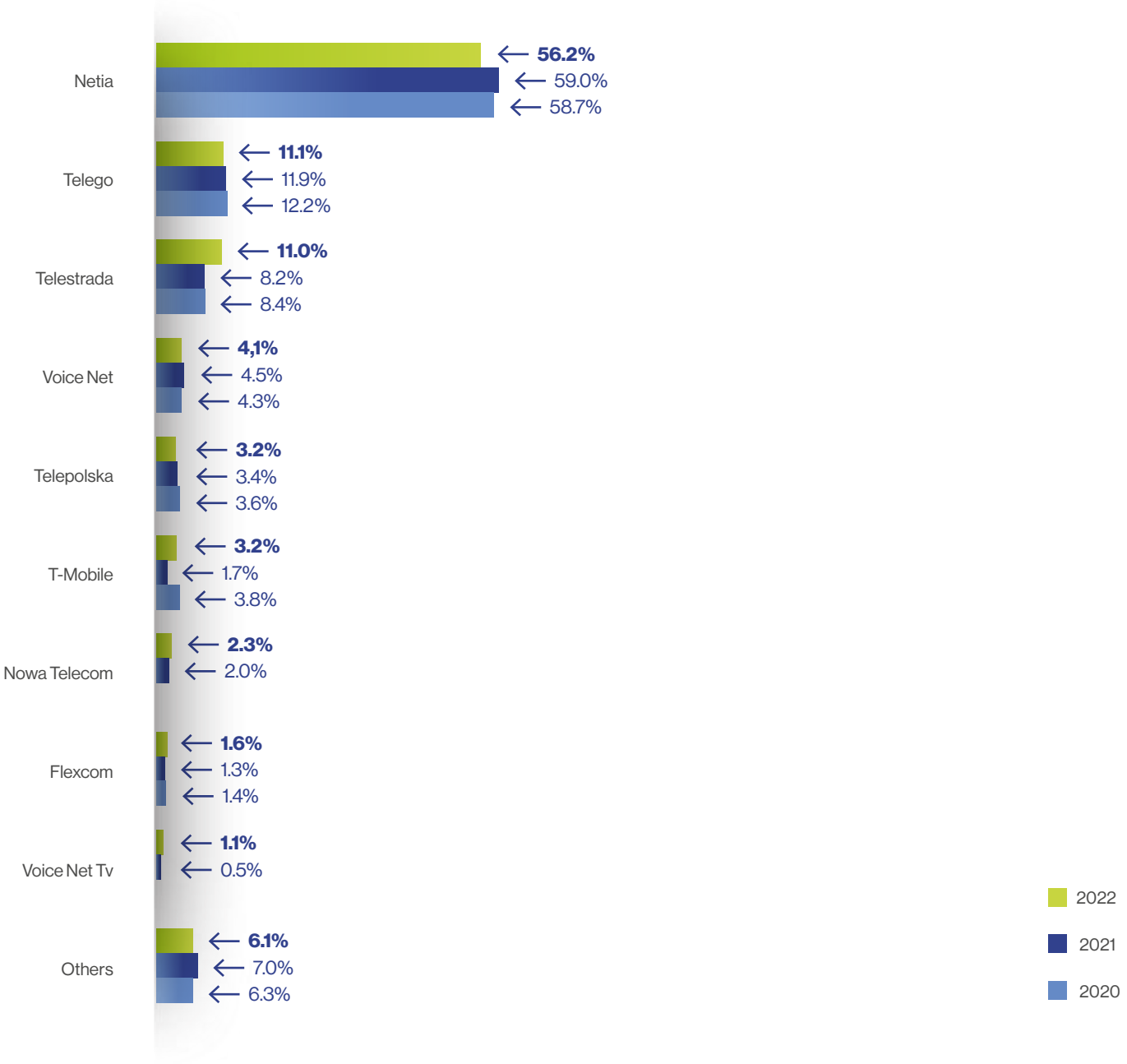
3.1.3.6 | Retail services based on WLR

In 2022, retail revenues provided based on wholesale WLR access amounted to PLN 108.53 million, and the total number of WLR subscriber connections amounted to 263.88 thousand. The number of subscribers using WLR services amounted to 203.75 thousand.

Among WLR operators, Netia held the largest revenue share in 2022, however, its share decreased by 2.8 percentage points to 56.2% compared to 2021. Significantly smaller shares were respectively recorded by Telego (11.1%), Telestrada (11.0%), Voice Net (4.1%), Telepolska (3.2%), T-Mobile (3.2%), Nova Telecom (2.3%), Flexcom (1.6%) and Voice Net TV (1.1%). The remaining operators covered 6.1% of the market, 0.9 percentage points less than last year.

Figure 42

Shares of operators in revenue provided through WLR-based retail services

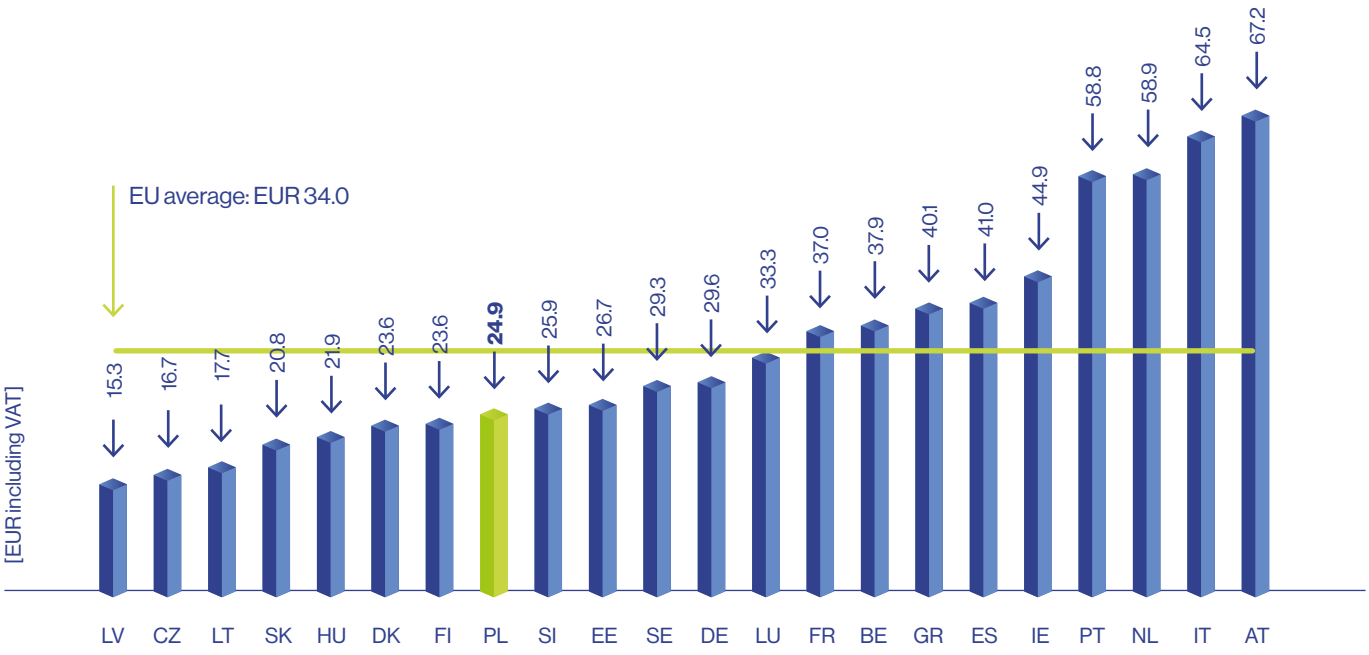


Source: databases maintained by UKE on the basis of reporting under Article 7 of the Telecommunications Act Other – entrepreneurs with a unit share of less than 1%

3.1.3.7 | Prices of fixed telephony services in the European Union countries

In 2022, the average price of fixed telephony services in the selected 22 EU countries was EUR 34.0, EUR 0.8 less than in the previous year. The lowest costs were paid by users from Latvia (EUR 15.3) and the highest by the Austrians (EUR 67.2). Thus, the price spread in selected EU countries was as high as EUR 51.8 The cost the fixed telephony which users in Poland had to bear was EUR 24.9, EUR 9.1 lower than the average price in selected EU countries. In this price list, Poland was ranked eighth behind Latvia, the Czech Republic, Lithuania, Slovakia, Hungary, Denmark and Finland.

Figure 43
Monthly basket values for average usage* in selected EU countries (EUR including VAT)



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

* According to the methodology adopted by the OECD, the medium usage basket consists of an average of 100 calls/month for a total of 385 minutes, of which 59% are local, 16% national, 23% are calls to mobile networks (F2M) and 2% are international calls.

3.2 | Internet access service

The Internet access market in Poland in 2022, following the pattern of previous years, was characterised by fragmentation, although the number of companies providing the service declined. The service was provided by 2607 entrepreneurs, 149 fewer compared to the previous year. Despite the decline in the number of service providers, the total number of Internet access users reached 17.91 million, up 3.5% compared to the previous year.
This trend also applied to service revenue and average revenue per user (ARPU). The Internet access market was worth PLN 7.67 billion in 2022, 7.4% more than in 2021.

A consumer preference survey conducted on behalf of UKE by IBC Advisory S.A[15] showed that 79.1% of surveyed Poles were using Internet access in 2022. It was the third[16] telecommunications service in terms of usage (after mobile telephony and television).

The Internet access service is divided into:

- fixed Internet access service,
- mobile Internet access service.

3.2.1 | Fixed Internet access service

3.2.1.1 | General Information

In 2022, 63.2% of households used fixed access, up 3.4 percentage points compared to 2021. Fixed Internet penetration continues to grow slowly but steadily.

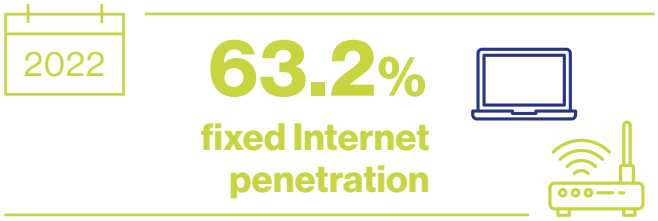
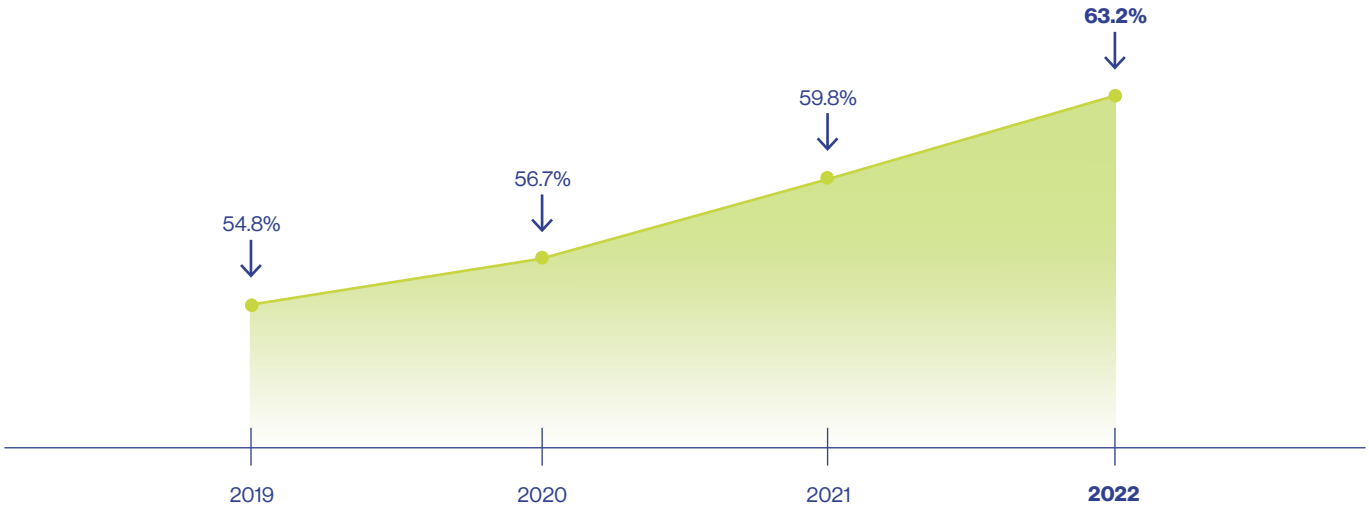


Figure 44
Fixed Internet services saturation rate



Source: databases maintained by UKE on the basis of reporting under Article 7 of the Telecommunications Act

[15] A research and consulting company engaged in market analysis and opinion polling.
[16] Information on the popularity of the service is based on the declarations of respondents to the consumer survey, differs from UKE's results based on reporting.

3.2.1.2 | Revenues

The value of fixed Internet access services in 2022 was PLN 5.42 billion. Revenues were higher compared to the previous year by 9.7% Average monthly revenue per user increased by 3.8% and amounted to PLN 49.33.

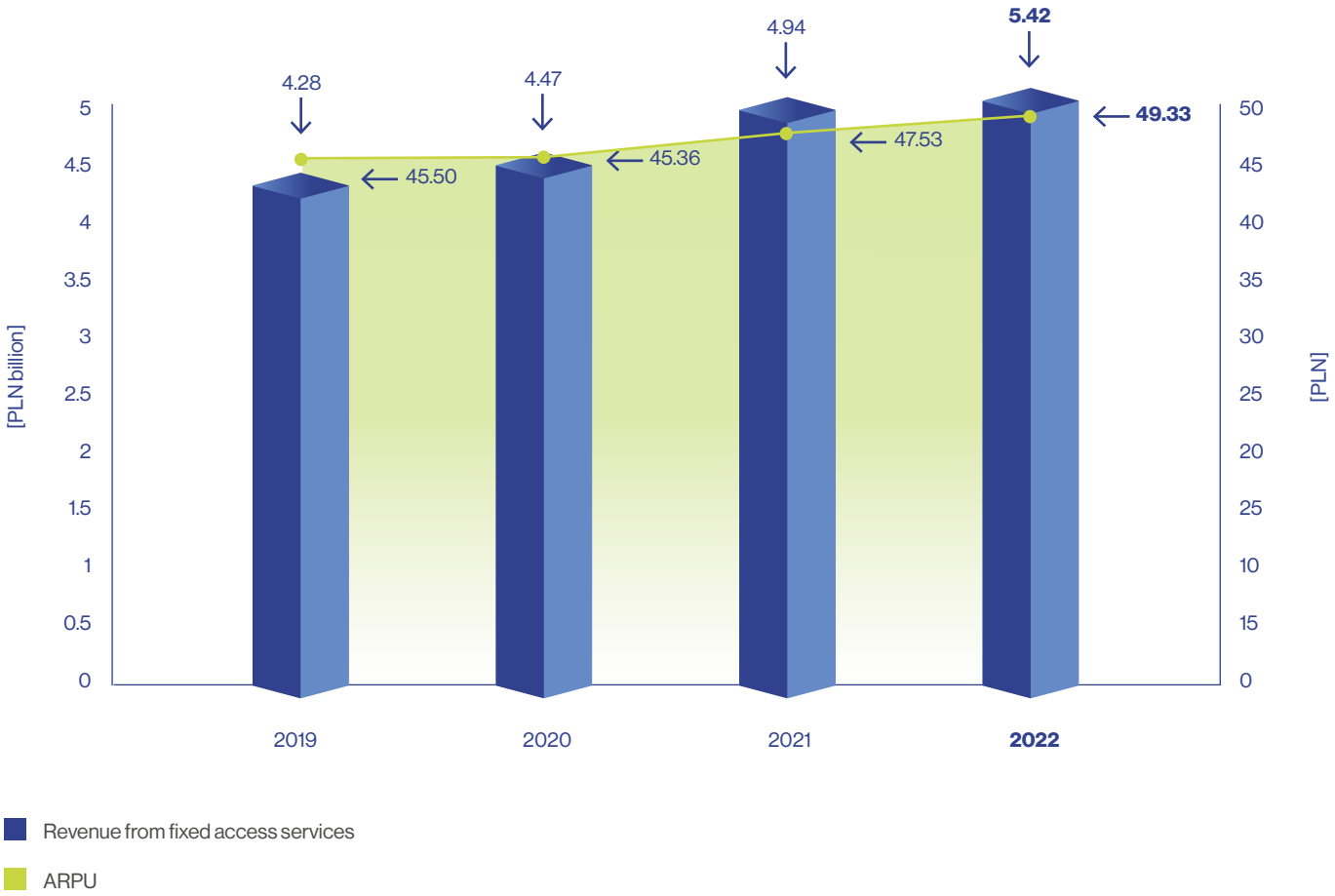
2022

PLN 5.4 billion

revenue from the fixed Internet access market

Figure 45

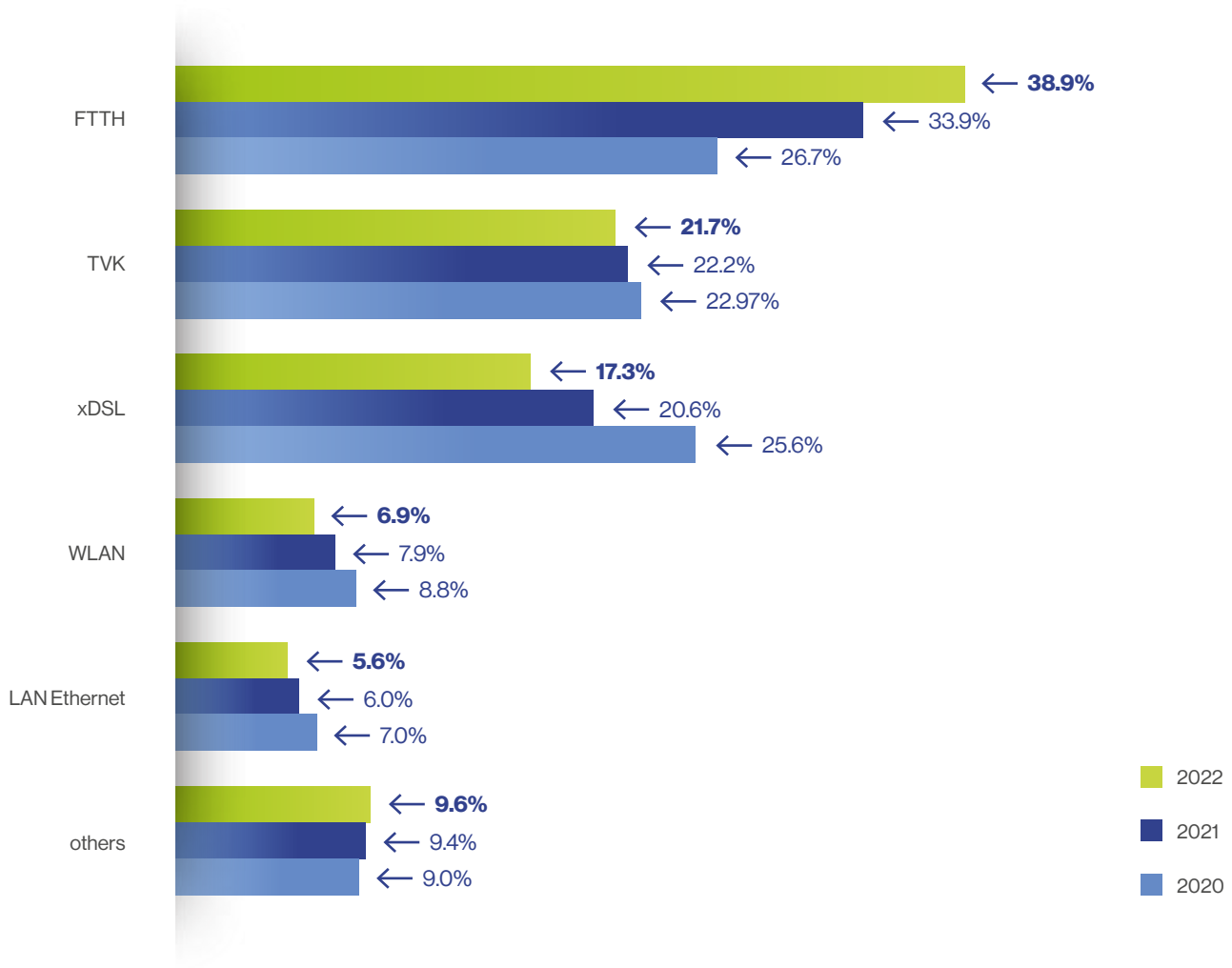
Revenue from the fixed Internet access market (PLN billion) and average monthly revenue per user (ARPU, in PLN).



Source: databases maintained by UKE on the basis of reporting under Article 7 of the Telecommunications Act

Fiber optics accounted for the largest percentage of fixed Internet access service revenues in 2022, as they have for the past several years. Their share in total fixed access revenues increased by 5 percentage points and reached 38.9%. In 2022, the value of the FTTH fiber optics market was PLN 2.11 billion, up 26% from 2021. Other major technologies show declines in shares. 21.7% of enterprise revenue (PLN 1.18 billion) were derived from services provided through cable TV modem connections. Despite the 7.2% increase in value compared to 2021, the share in total revenue from fixed access declined by 0.5% A declining trend can also be observed in xDSL revenue (PLN 0.94 billion). In 2022, their value decreased by 7.5%.

Figure 46
Structure of revenue from fixed Internet access in terms of the technology used



Source: databases maintained by UKE on the basis of reporting under Article 7 of the Telecommunications Act

3.2.1.3 | Users

In 2022, there were 491.26 thousand fixed Internet access users, which means that services were delivered to 9.16 million customers. The recorded increase over the previous year was 5.7%.

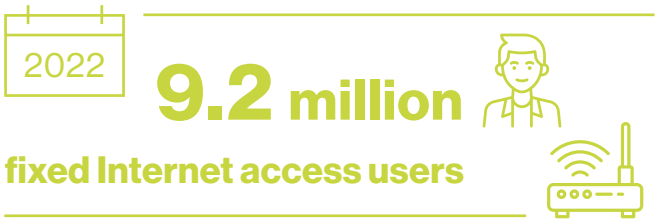
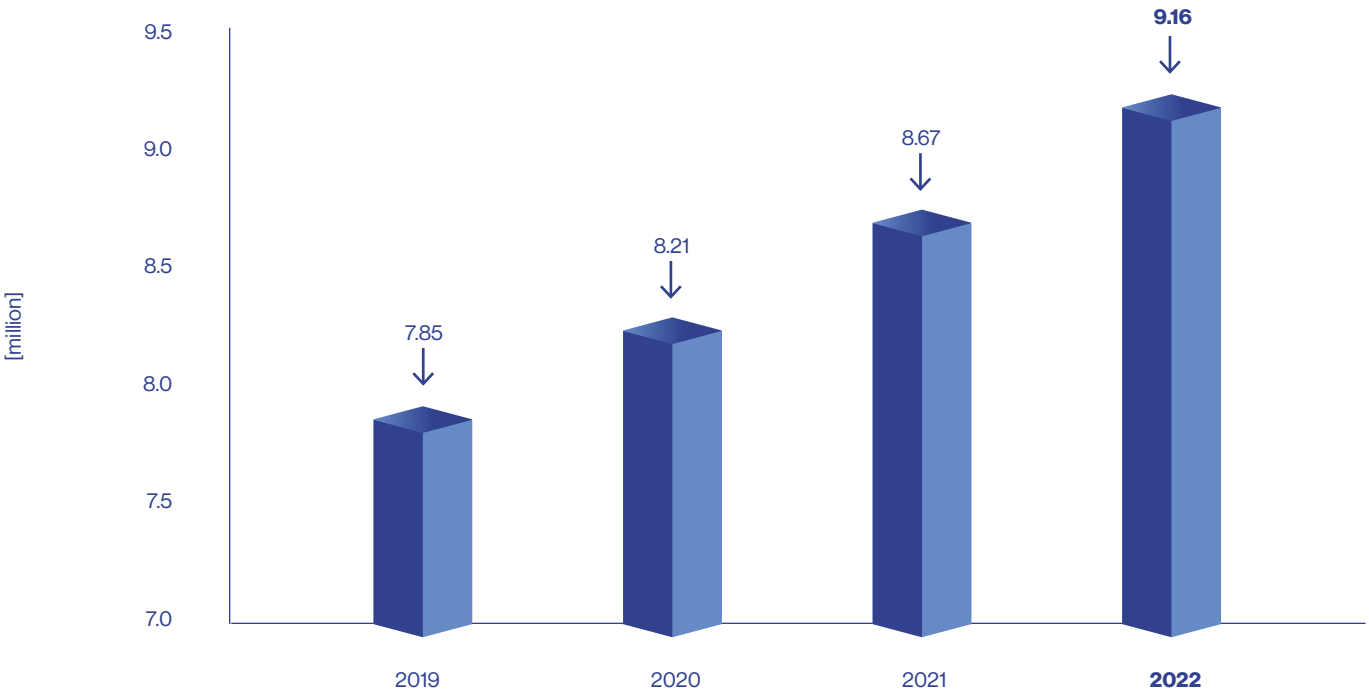


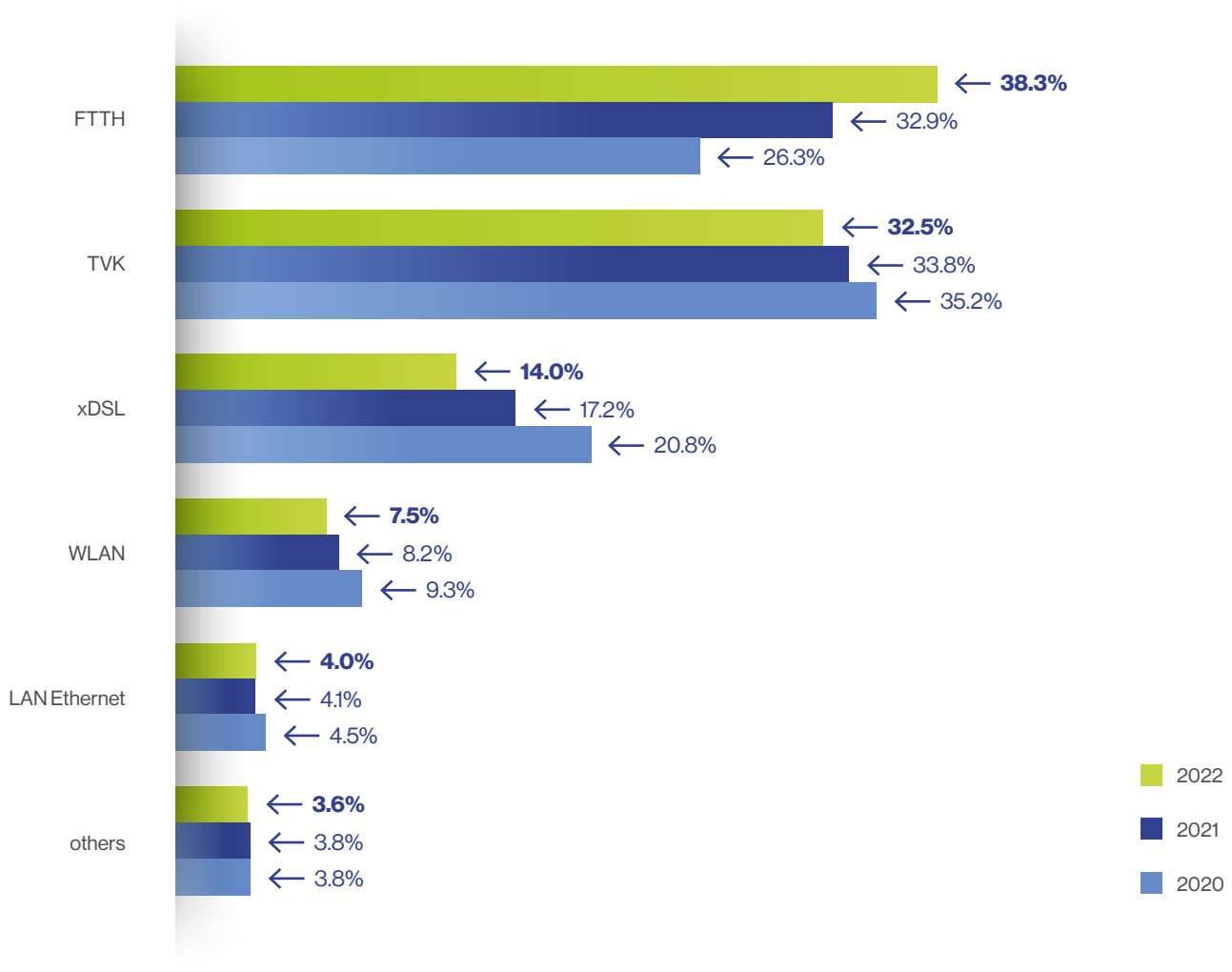
Figure 47
The number of fixed Internet users (in millions)



Source: databases maintained by UKE on the basis of reporting under Article 7 of the Telecommunications Act

When it comes to percentage shares of various Internet access types in terms of the number of users, fiber-optic technology, which is being chosen by an increasing number of fixed access users ranked first in 2022. FTTH's share in the access structure was 38.3%, up 5.4 percentage points compared to 2021. Another significant type of access was TVK cable modem, with 32.5% of fixed Internet users being served. It is clear that the share of this technology is declining in favour of fiber optics, even though the number of users is growing at an average annual rate of 1.5%. Another technology that is losing shares is xDSI, which was used by 14% of fixed access users in 2022, down by 3.2 percentage points compared to the previous year. The number of people with xDSL access fell by 13.8% year-on-year.

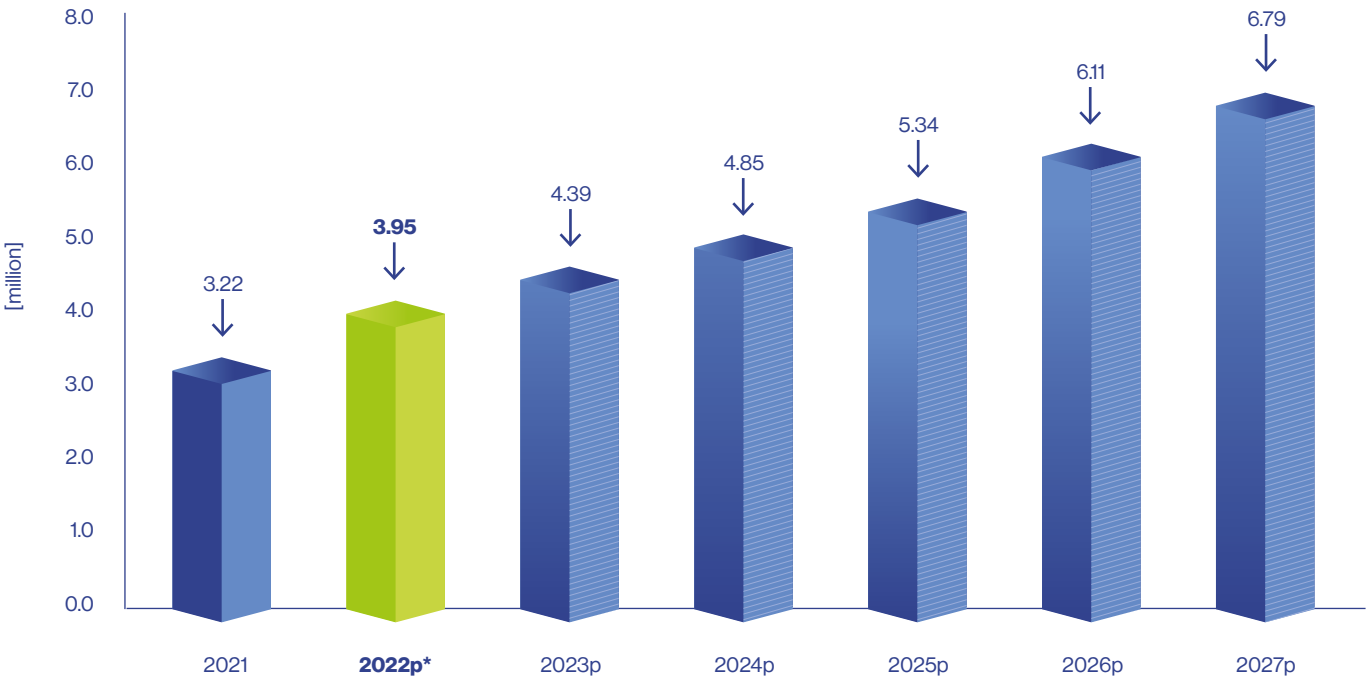
Figure 48
Structure of fixed Internet users in terms of the access technology used



Source: databases maintained by UKE on the basis of reporting under Article 7 of the Telecommunications Act

Analysys Mason forecasts that the number of optical fiber lines will grow steadily, by an average of 11.5% per year. According to the estimates of this company, the number of FTTP/B fiber accesses in Poland will reach 6.79 million in 2027.

Figure 49
Number of FTTP/B links in Poland

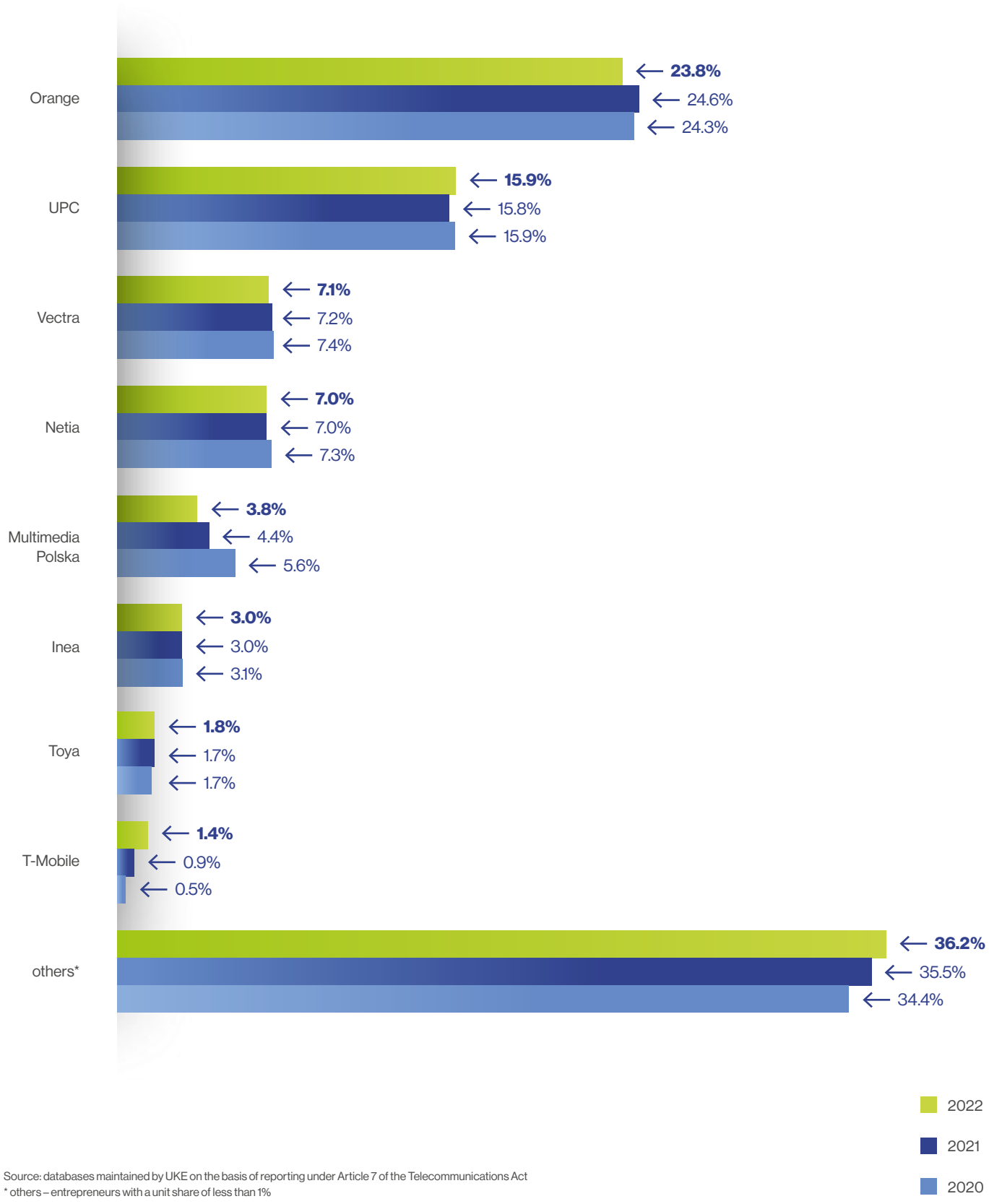


Source: DataHub database maintained by Analysys Mason
p-prognosis
* data for 2022 was presented by Analysys Mason as a prognosis due to the fact that the publication was prepared in Q2 2022.

For another year in a row, the share structure[17] in terms of the number of fixed Internet users has not changed significantly. Orange Polska remained the main player in the market. Its share in 2022 dropped to 23.8%. As in the previous year, UPC ranked second with a share of 15.9%, up 0.1 percentage points compared to the previous year. It was followed by Vectra and Netia who had similar shares (7.1% and 7.0%, respectively). In their case, changes from the previous year were minor. Moreover, the threshold of 1% share in the number of customers was exceeded by Multimedia, Inea, Toya and T-Mobile. In the case of the latter, rapid growth in the number of fixed access users is evident. In 2022, the number of users of T-Mobile service grew by 76.4% year-on-year, in the previous year by 97.6%, so that the share of fixed access users rose to 1.4% (up 0.5 percentage points).

[17] Shares shown for telecommunications enterprises with more than 1% share of the market.

Figure 50
Shares of operators in terms of the number of fixed Internet users

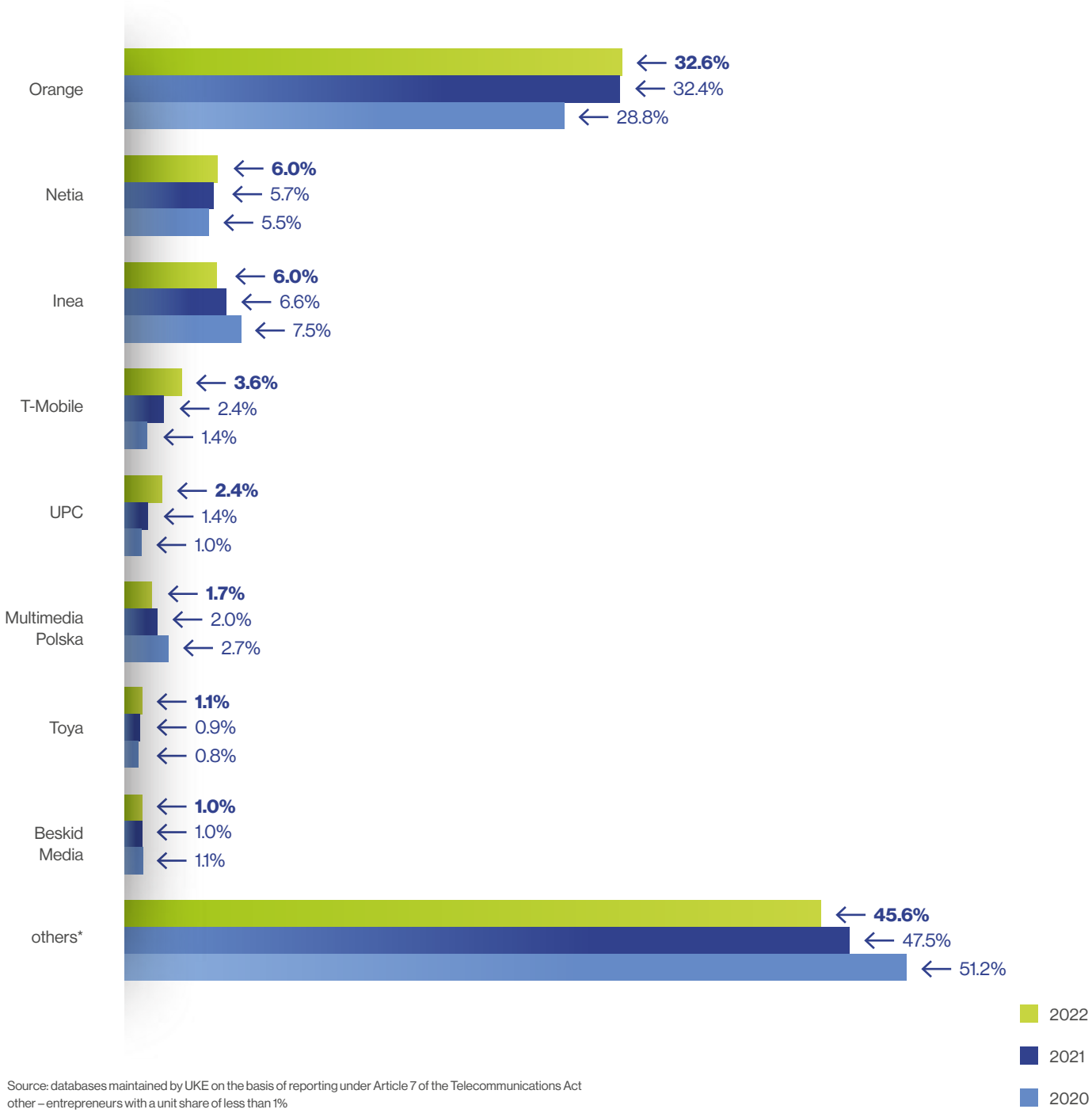


Source: databases maintained by UKE on the basis of reporting under Article 7 of the Telecommunications Act
* others – entrepreneurs with a unit share of less than 1%

3.2.1.3.1 | Fibre optic links

In 2022, fiber-optic access was provided by 1185 companies, of which more than 1% share in the number of customers was obtained by 7 entrepreneurs. The largest number of Internet users using fiber optics to access the Internet belonged, as in the previous two years, to Orange Polska's pool of customers. The company provided services to one in three FTTH technology users. Its share in the structure of this type of access was 32.6% (up 0.2 percentage points). Second and third place (6% each) went to Inea and Netia. Inea's share declined for another year in a row (by 0.6 percentage points), while Netia's share increased by 0.3 percentage points. T-Mobile, which gained 1 percentage point, ranked fourth and served 2.4% of FTTH users.

Figure 51
Shares of operators in the total number of users using the FFTH Internet access service



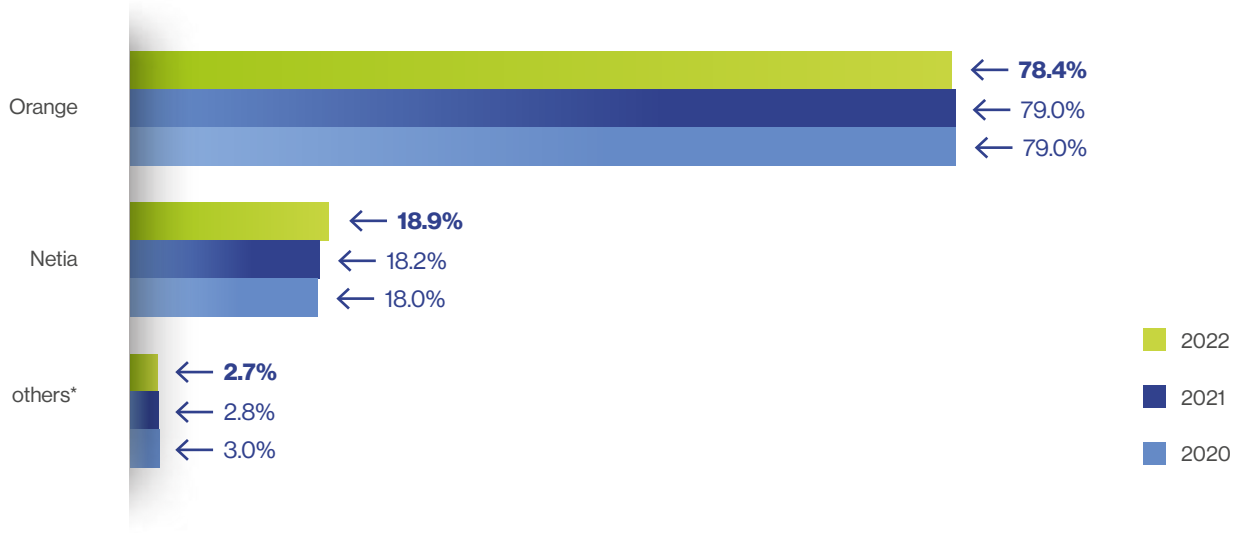
Source: databases maintained by UKE on the basis of reporting under Article 7 of the Telecommunications Act
other – entrepreneurs with a unit share of less than 1%

3.2.1.3.2 | xDSL

The market for Internet access via xDSL technology was divided between two companies: Orange Polska and Netia, which combined in 2022, provided access to 97.3% of such customers. The remainder of the market was served by 95 smaller players, who together provided Internet to 2.7% of users.

In 2022, Orange's share fell in favour of Netia. The former served 78.4% of xDSL users (down 0.6 percentage points), while Netia provided service to 18.9% of the technology's customers (up 0.7 percentage points). The share of other players also declined (by 0.1 percentage points).

Figure 52
Shares of operators in the total number of users using the xDSL Internet access service

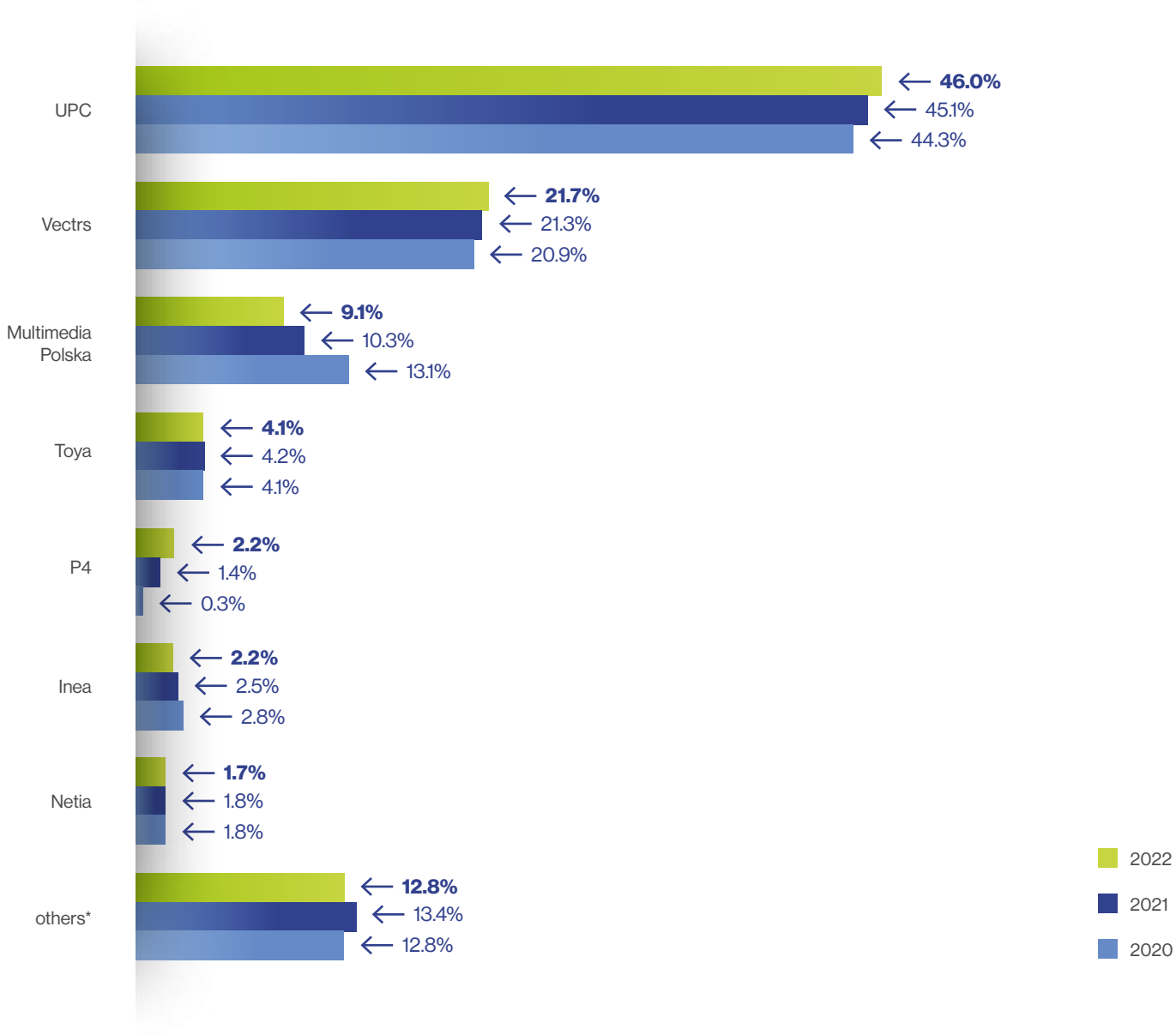


Source: databases maintained by UKE on the basis of reporting under Article 7 of the Telecommunications Act
others – entrepreneurs with a unit share of less than 1%

3.2.1.3.3 | TVK cable modem

In 2022, the largest cable TVK Internet provider was UPC, which achieved a 46% share of this market, 0.9 percentage points higher than in the previous year. It was followed by Vectra with a 21.7% share. In Vectra's case, there was also an increase in its share. Multimedia lost ground for another year in a row (down 1.2 percentage points to 9.1%). Toya (4.1%) remained at a level similar to the previous year and ranked fourth on the list. P4's importance in this market segment is increasing. In 2022, its share rose to 2.2% (up 0.8 percentage points), enabling it to rank fifth.

Figure 53
Shares of operators in the total number of users using the cable TV modem service to connect to the Internet



Source: databases maintained by UKE on the basis of reporting under Article 7 of the Telecommunications Act
other – entrepreneurs with a unit share of less than 1%

3.2.1.3.4 | WLAN and LAN Ethernet

The WLAN and LAN Ethernet markets are particularly fragmented. In 2022, the LAN Ethernet access market was served by 1071 entrepreneurs. There were 1553 of them operating in the WLAN market. Together, these technologies provided Internet services to 1.02 million users in 2022, down by 0.8% compared to the year earlier.

Five entrepreneurs in the WLAN market have surpassed the 1% share threshold. Shares of the largest 17 companies in the LAN Ethernet market ranged from 1% to 9.8%. The highest share in providing services via LAN Ethernet access was achieved by Netia, which in 2022 served 9.8% of customers with this technology (an increase of 2.4 percentage points).

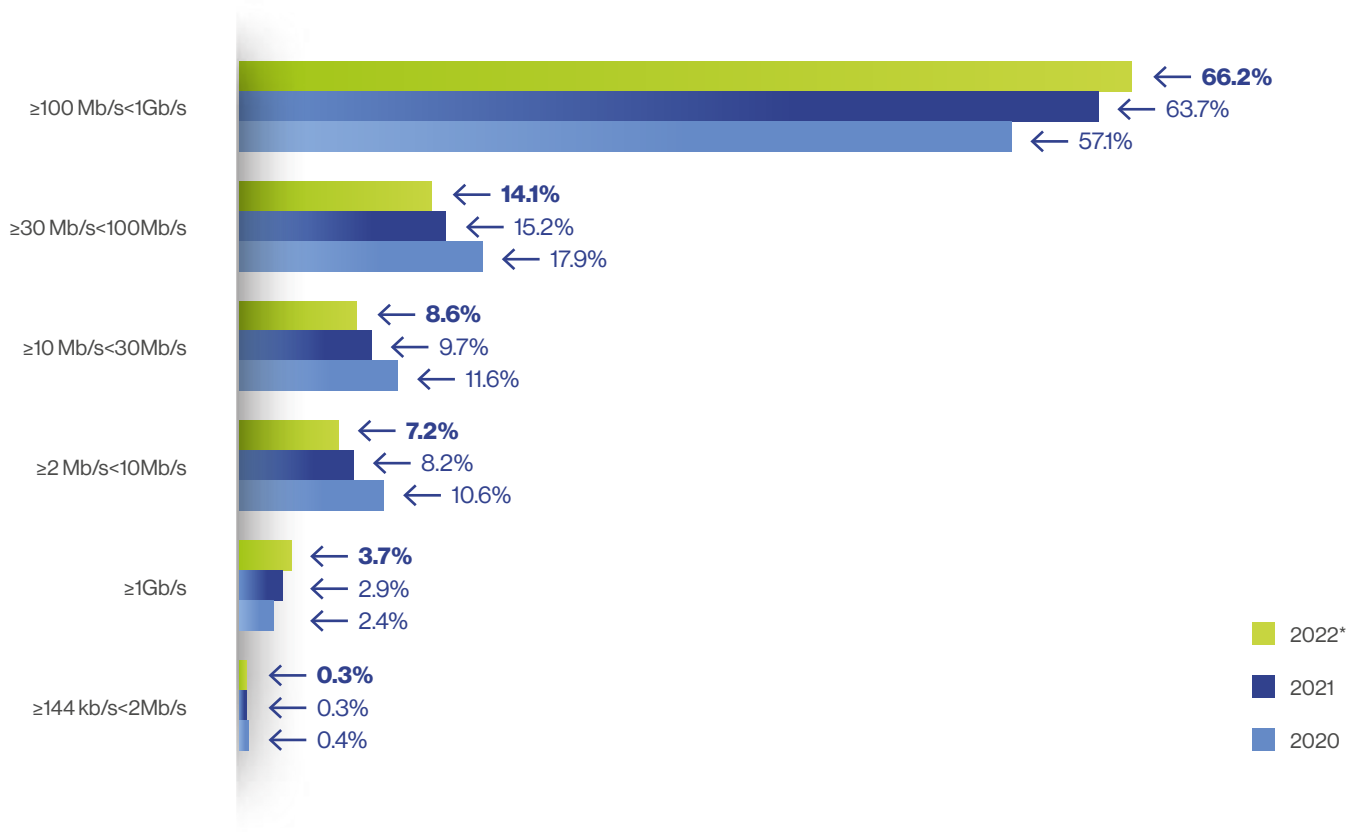
3.2.1.4 | Link capacity

The most popular fixed lines in 2022, as in the previous two years, were the connections with a minimum capacity of 100 Mbps and no more than 1 Gbps. High-speed lines were used to provide services to 66.2% of fixed access users (up 2.5 percentage points compared to the year earlier).
In 2022, the popularity of lines with the highest bandwidths, i.e. a minimum of 1 Gbps, has also increased. Their number increased by 29% compared to the previous year. Very high-speed lines were used by 3.7% of users (up 0.8 percentage points).

69.9%

share of lines with a minimum capacity of 100 Mbps

Figure 54
Shares of connections broken down by capacity



*Data as of 1 July 2022
Source: UKE based on data collected for the European Commission questionnaire for COCOM

3.2.1.5 | Retail services based on BSA and LLU

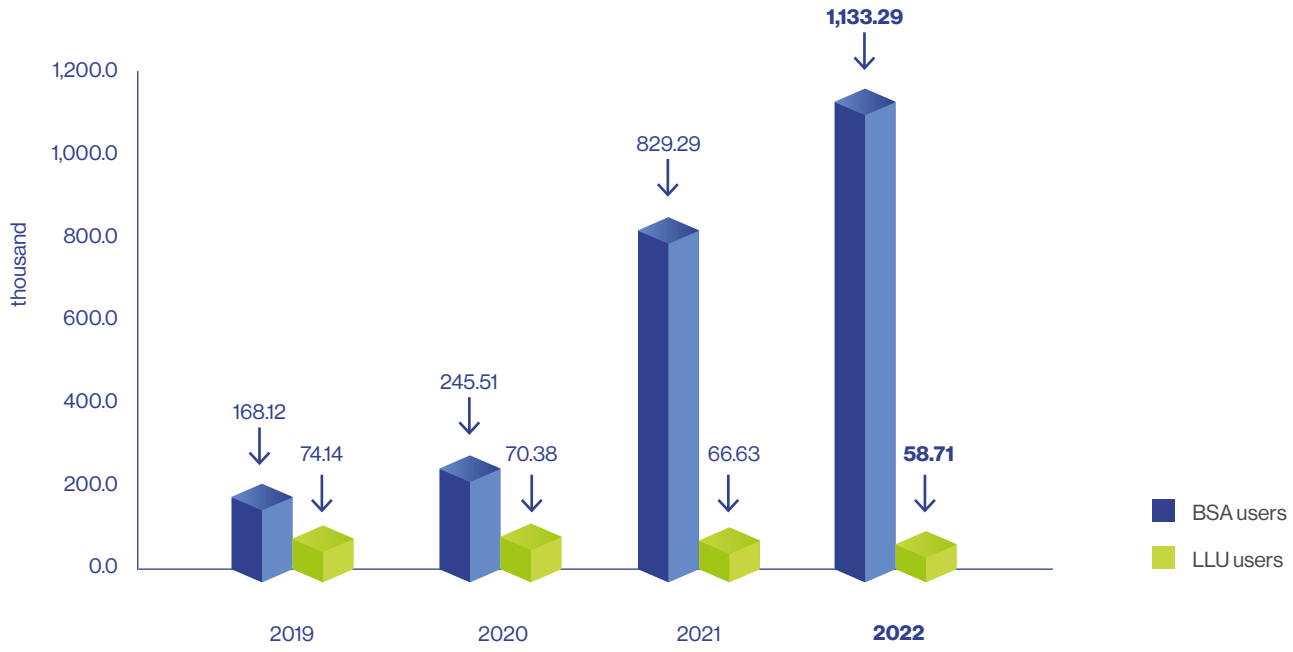
Recent years have seen the development of wholesale services, on the basis of which businesses can provide retail services to customers. This is influenced by investments within the scope of Operational Programme Digital Poland (OPDP), using funds from the European Regional Development Fund. They are meant to eliminate territorial differences in high-speed Internet access. Polish operators, actively participating in this programme, are making investments in many places in Poland, and an increasing number of entrepreneurs have access to the network to provide their own retail services to customers, mainly on a BSA basis.

Another year in a row saw an increase in the number of BSA-based Internet access customers, although not as large as the year before. In 2022, the number of customers who used such access rose by 36.7% since 2021, amounting to 1.13 million. This increase was primarily a result of the aforementioned trend of making fiber optic networks available in a wholesale model (BSA) to other operators, mainly those without their own fiber optic infrastructure.

The situation was different in the LLU access market. As the BSA market was developing, the number of LLU users decreased by 11.9% to 58.71 thousand.

Figure 55

The number of users (in thousands) to whom entrepreneurs provided Internet services based on BSA and LLU



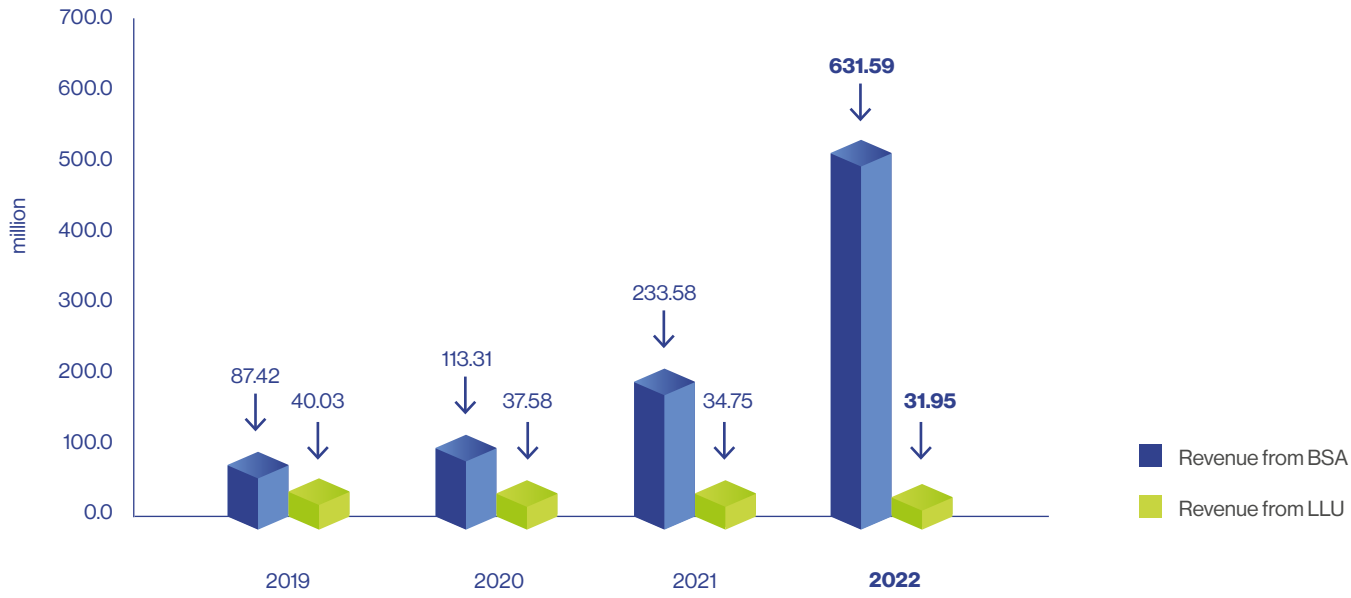
Source: databases maintained by UKE on the basis of reporting under Article 7 of the Telecommunications Act

In 2022, revenues from BSA amounted to 631.59 million and accounted for 95.2% of total revenues from services on a wholesale network access basis. This represents an increase of 170.4% compared to the previous year. Revenues from BSA accounted for 12.8% of total fixed Internet revenues (vs. 4.7% in 2021). The increase in revenues from BSA concerned predominantly Orange Polska, which in 2022 accounted for 43.2% of users of this access18. The company expects the service on BSA wholesale lines to grow.

In 2022, the value of the LLU market is reported to have declined to PLN 31.95 million (by 8.1%). This market segment is seeing a steady decline in revenues. LLU accounted for 0.6% of total revenues.

[18] In the second half of 2021, the company activated a significant number of customers on the BSA basis (a total of 377% of its BSA customers in 2021). The number of users increased again the following year (by 57%). The above situation meant that revenue for 2021 mostly related only to the second half of the year, while revenue for 2022 came from customers who arrived in 2021 and new customers with whom contracts were signed in 2022.

Figure 56
Revenue from users provided with Internet services based on BSA and LLU

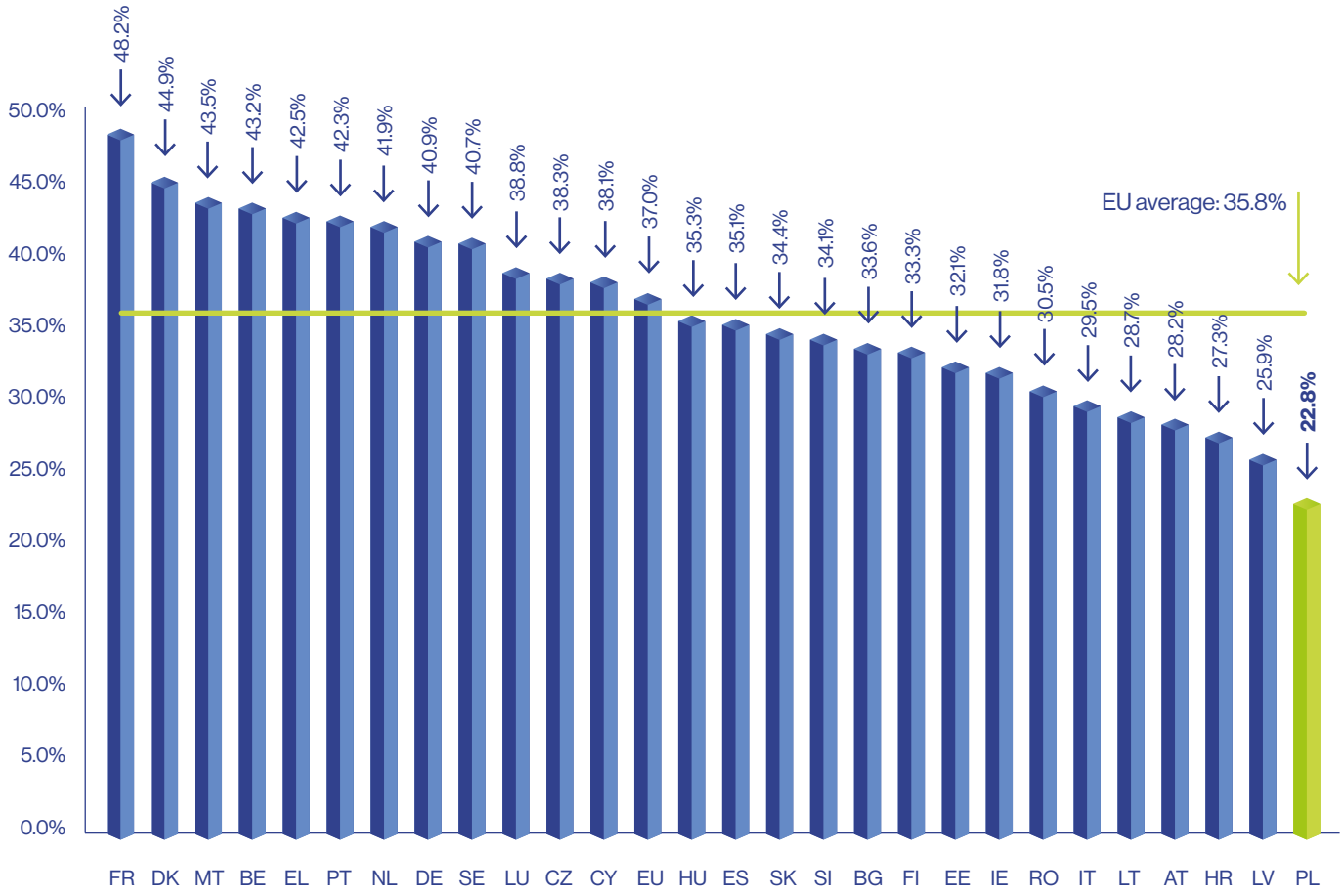


Source: databases maintained by UKE on the basis of reporting under Article 7 of the Telecommunications Act

3.2.1.6 | Comparison with European countries

In the case of fixed access, service penetration in 2022, as measured by the number of lines per population, was still the lowest compared to the rest of the European Union. Fixed broadband Internet saturation in our country increased by 0.4 percentage points and reached 22.8%. The penetration rate was 13 percentage points lower than that of the EU countries' average.

Figure 57
Penetration of fixed Internet services in the EU (per 100 inhabitants)[19]



Source: Digital Agenda Scoreboard, July 2022
Note: The methodology adopted by the European Commission differs from the UKE methodology, hence the differences between penetration calculations.

[19] Penetration in EU countries should be understood as the number of fixed broadband access services (lines) per 100 people, while in Poland it should be understood as the number of fixed Internet users per 100 people.

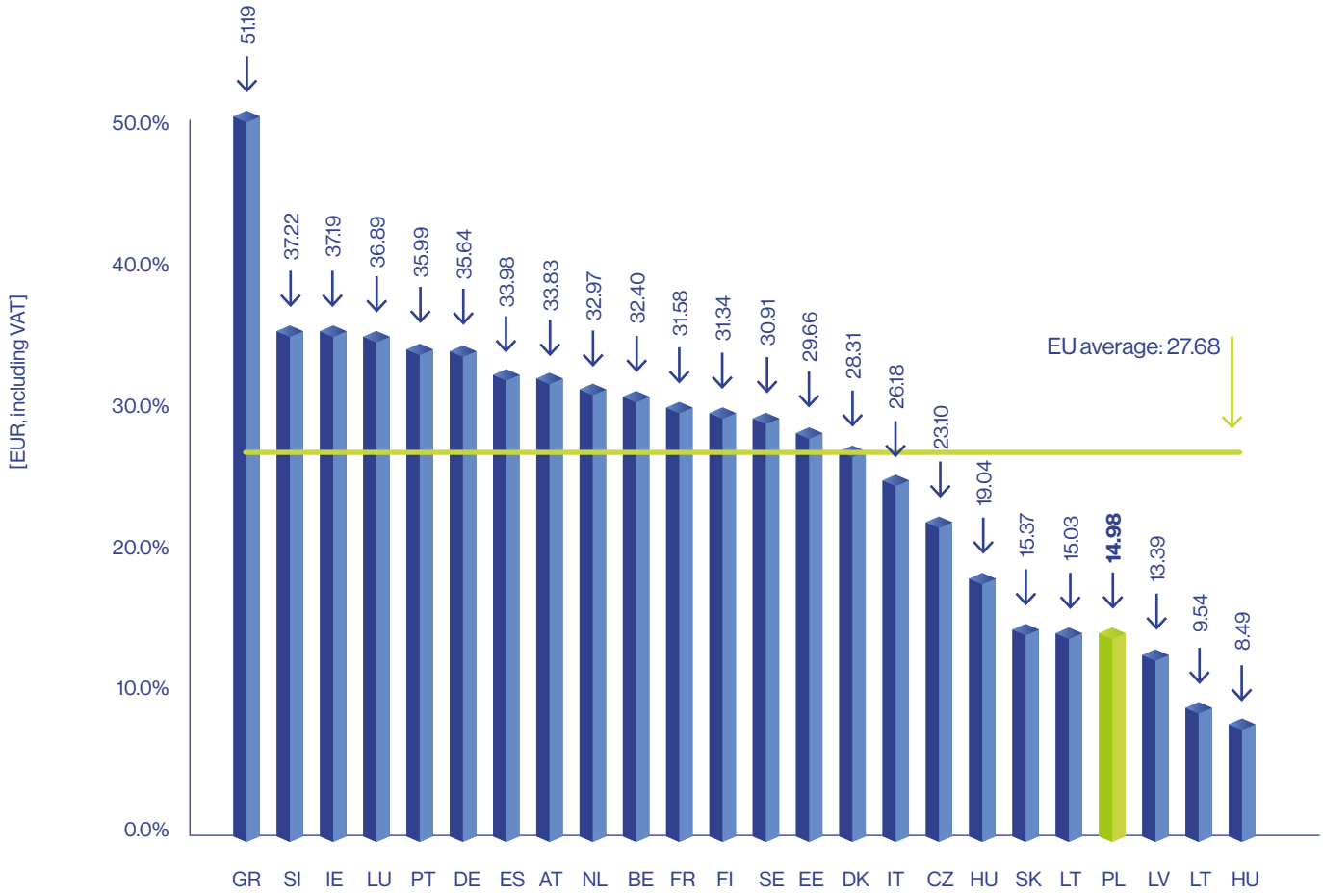
Poland compares much better with other EU countries when the cost of fixed Internet access services is taken into account.

The OECD Fixed Broadband Price Benchmarking[20] database as of December 2022 was used to compare service prices in the EU countries.

The cost of fixed Internet access service in Poland in 2022 stood at EUR 14.98, and was lower than the average cost for all EU countries by EUR 12.69. Poland was among the top EU countries in terms of low service prices. Only Hungary, Lithuania and Latvia offered lower prices than in our country. The most expensive fixed Internet was reported in Greece.

Figure 58

Average monthly cost of service in the EU, calculated for the OECD Medium basket: 120 GB/>100 Mbps



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

Note: tariffs for residential and business customers buying only Internet access were included (bundles were excluded from the analysis). For Poland, home Internet 5G 30Mbps (24 months) offered by Polkomtel was chosen. Service cost as of December 2022, taking purchasing power parity into account.

The methodology adopted by the European Commission differs from that of UKE, hence there are differences between the average monthly cost of service for the OECD Medium basket and the ARPU calculated by UKE. ARPU is calculated as the value of revenue divided by the number of users, divided by 12 months. The average monthly cost of the service in the EU is calculated for a specific OECD Medium basket containing 120 GB of data, Internet speed above 100 Mbps.

[20] Database developed by the Strategy Analytics company.

3.2.2 | Mobile Internet access

3.2.2.1 | General Information

Following the pattern of previous years, the penetration of mobile Internet services in Poland in 2022 is presented separately for access provided via all possible categories of mobile access[21] and separately for dedicated offerings provided exclusively via modems, cards, keys. In 2022, all types of mobile Internet access (including access on phones) combined resulted in a penetration of 202.4% in Poland. The service saturation index has increased by another 3.7 percentage points over the previous year. An ever-decreasing upward trend is observed for this indicator. We are dealing with a market where the saturation of services is high – on average there are two accesses per Pole.

Taking into account dedicated mobile access (via modems, cards, keys), saturation of the service in 2022 rose to 23.1% (up 0.5 percentage points).

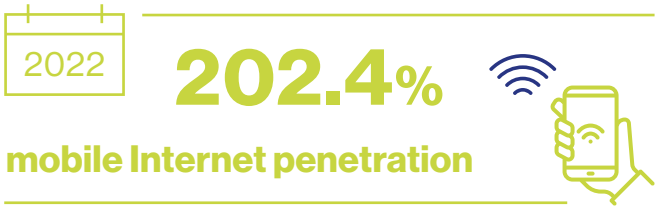
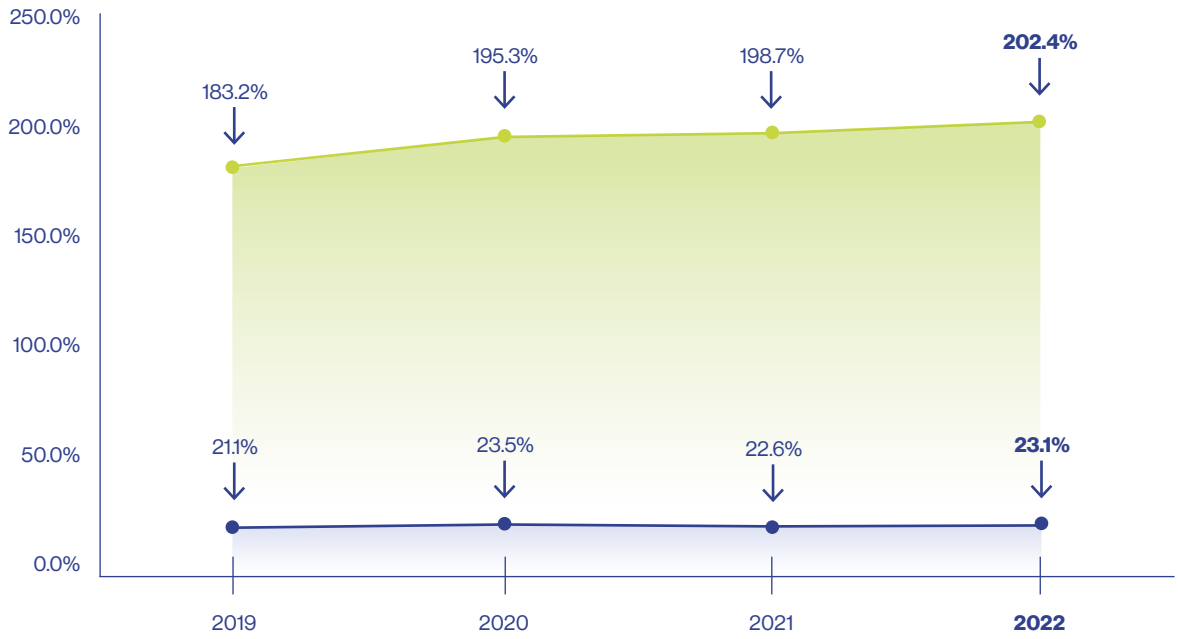


Figure 59
Mobile Internet access penetration



mobile access (all categories)

dedicated mobile access (modems, cards, keys)

Source: databases maintained by UKE on the basis of reporting under Article 7 of the Telecommunications Act

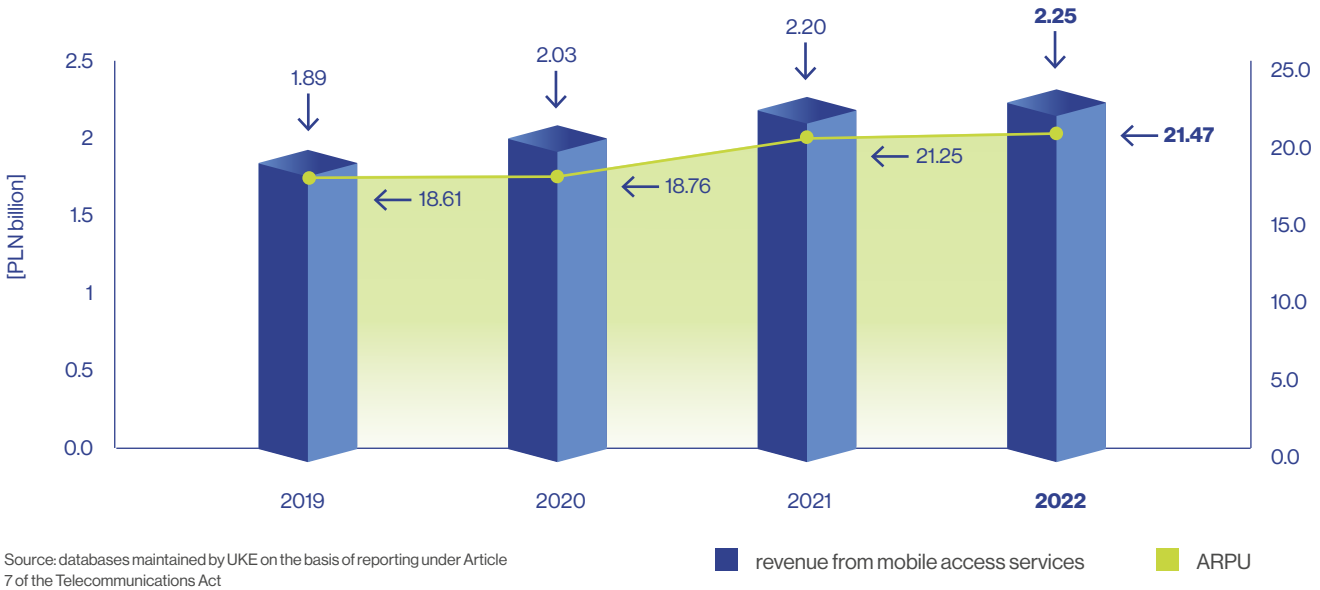
[21] The mobile access categories include: active SIM cards in mobile networks actually used for voice service, dedicated data transmission offers for additional voice service bundles that require an extra fee, and dedicated data transmission offers for services sold separately and provided solely via cards/modems/keys (e.g. USB modems, PCMCIA cards, ExpressCard).

3.2.2.2 | Revenues

In the case of revenues from mobile Internet access services, dedicated access via modems, cards, keys was taken into account, just as for determining the number of mobile Internet users. In 2022, mobile access service revenue grew by 2.4% to PLN 2.3 billion.

Average revenue per user in mobile access increased. In 2022, it stood at PLN 21.54 (up 0.3 percentage points). ARPU from mobile Internet was more than twice as low as from services provided via fixed access.

Figure 60
Revenue from the mobile Internet access market (PLN billion) and average monthly revenue per user (ARPU, in PLN)

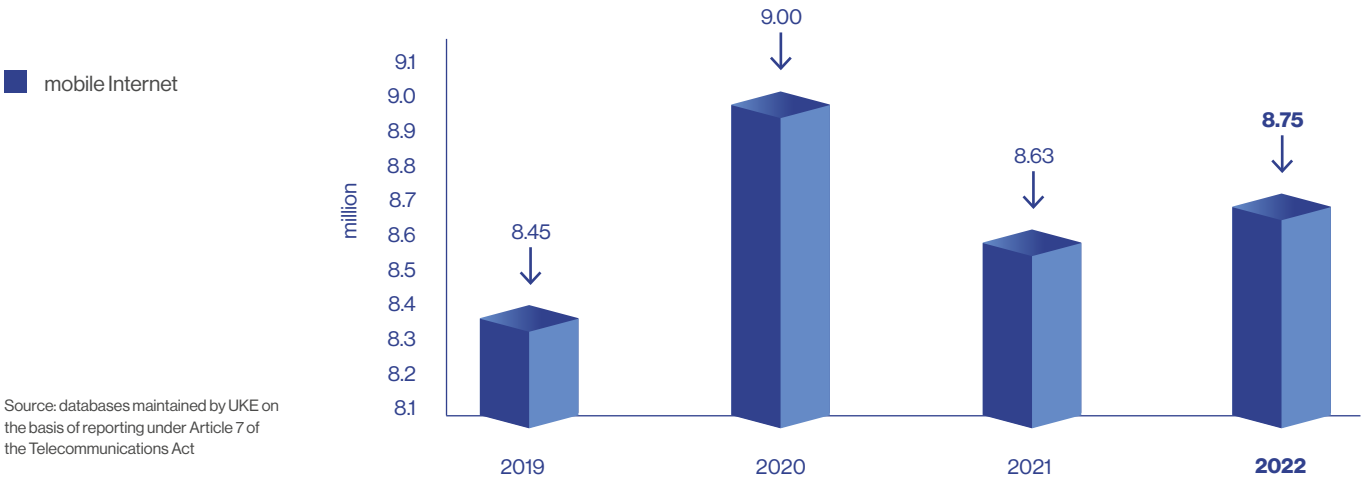


Source: databases maintained by UKE on the basis of reporting under Article 7 of the Telecommunications Act

3.2.2.3 | Users

In 2022, customers with mobile access provided via dedicated devices, such as modems, cards or keys, accounted for less than half of customers, as was the case in the previous year overall Internet access[22]. Mobile access was provided to 48.9% of total Internet users (down 1 percentage point compared to 2021). In 2022, dedicated Internet access was used by 8.75 million users.

Figure 61
The number of mobile Internet access users (in millions)

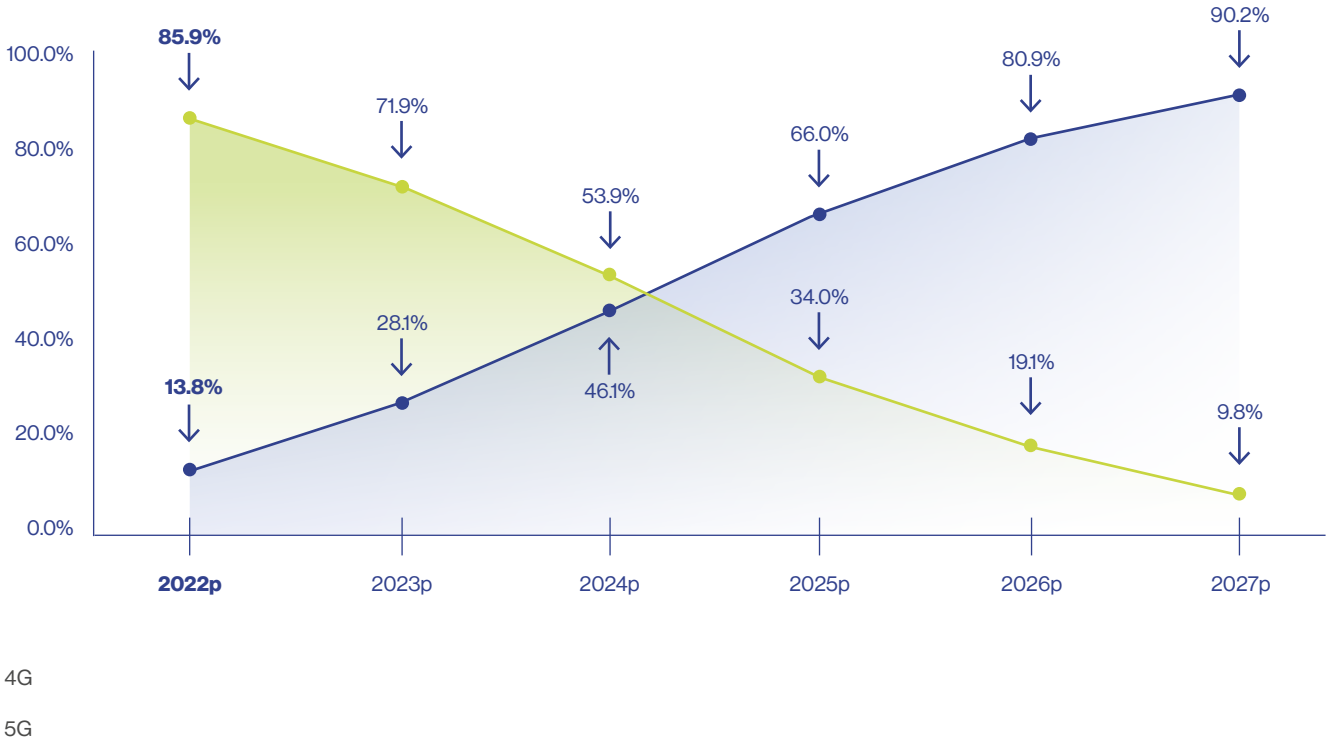


Source: databases maintained by UKE on the basis of reporting under Article 7 of the Telecommunications Act

[22] Fixed Internet plus dedicated mobile access devices like modems, cards, keys.

Analysys Mason predicts significant growth in mobile access performance. According to the company's prognosis, 85.9% of dedicated access users have 4G access. The company estimates that 4G technology will be quite quickly displaced by 5G technology. The share of 5G users, according to the company, could rise as high as to 90.2 percent in the next four years.

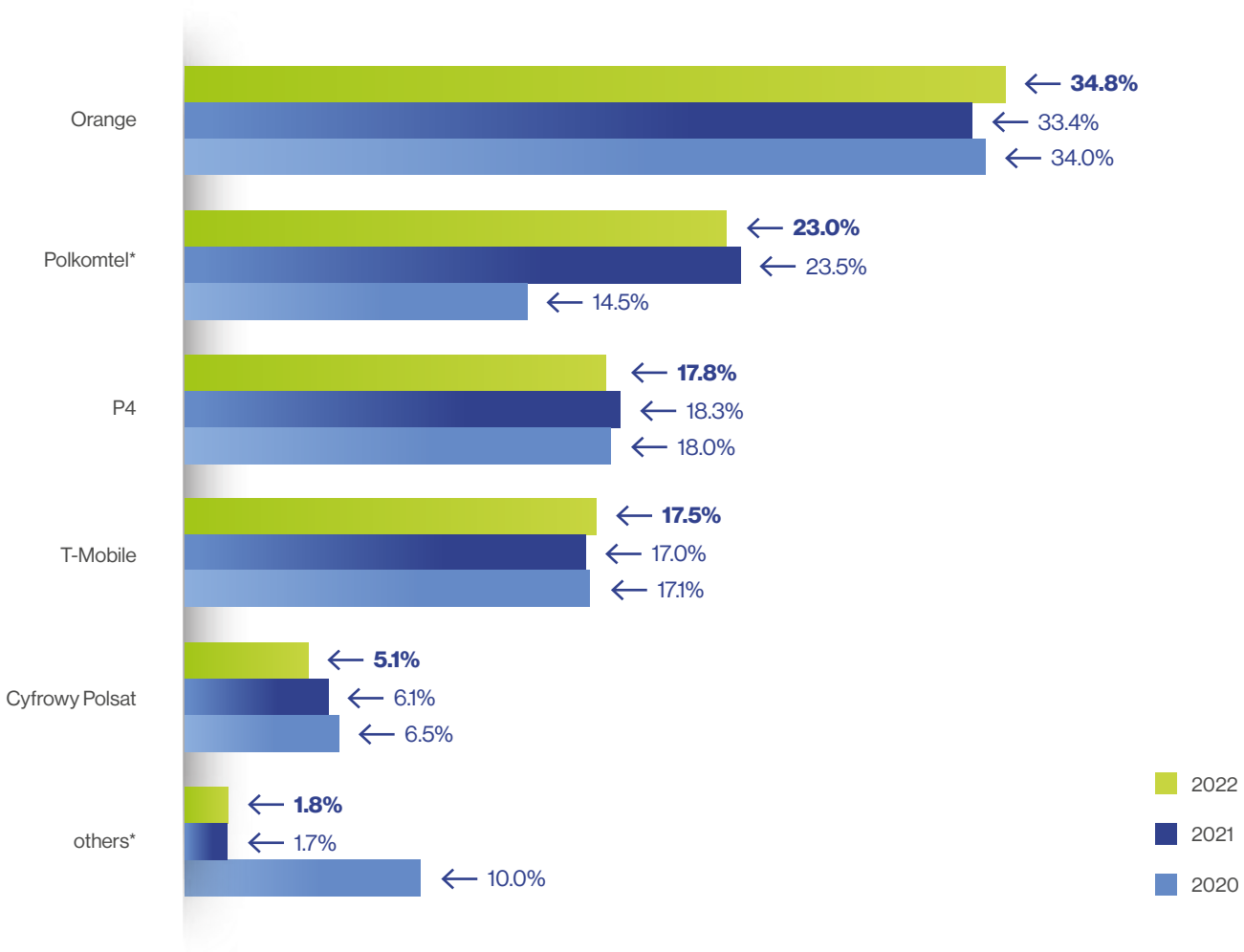
Figure 62
The share of 4G and 5G technologies in the total number of dedicated mobile access devices



Source: DataHub database maintained by Analysys Mason
p-prognosis
*data for 2022 was presented by Analysys Mason as a prognosis due to the fact that the publication was prepared in Q2 2022.

Orange Polska remained the leader of the mobile access market in 2022. The company provided services to 34.8% of users of this technology (up 3.1 percentage points compared to 2021). Second place, as in the previous year, went to Polkomtel. In 2022, the operator provided services to 23% of customers, and its share increased by 0.7 percentage points from 2021. In third place, as in the previous year, was P4 which provided services to 17.8% of users. The company saw its share fall by 3.4 percentage points. T-Mobile, fourth in the ranking, strengthened its market share by 0.1 percentage points.

Figure 63
Shares of entrepreneurs in terms of mobile Internet users



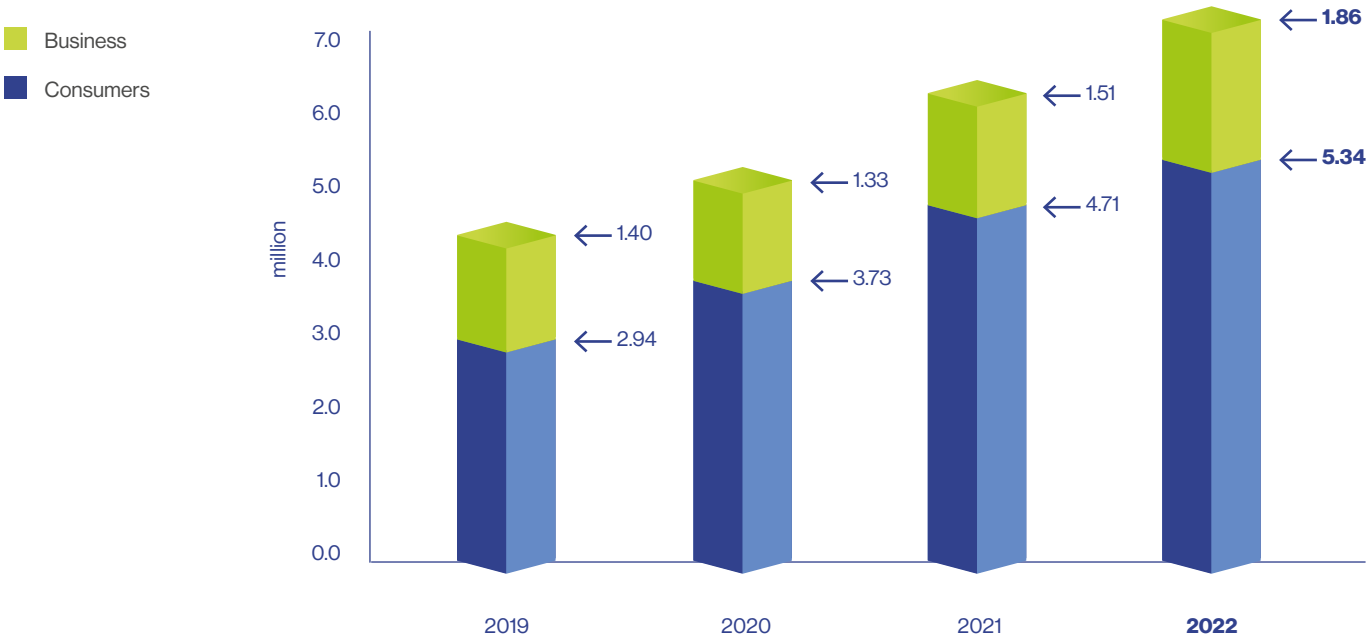
Source: databases maintained by UKE on the basis of reporting under Article 7 of the Telecommunications Act
*others – entrepreneurs with individual share not exceeding 1% (MVNO, MVNE, ISP)
*The chart shows a large share of the "others" category in 2020, followed by a significant decline in 2021. This is due to the acquisition of Aero2 by Polkomtel in 2021, so the share of "others" in 2021 fell, while Polkomtel's share increased.

3.2.2.4 | Traffic volume

The volume of traffic transmitted via all mobile accesses[23] in 2022, taking into account both data downloaded and sent by Internet users, amounted to 7.20 million TB. This meant an increase of 15.8% compared to 2021. The share of business increased in the traffic structure, with 74.1% of mobile traffic generated by residential customers.

7.2 million TB the amount of data transferred via mobile networks

Figure 64
The amount of data transferred via mobile networks in Internet access service



Source: databases maintained by UKE on the basis of reporting under Article 7 of the Telecommunications Act

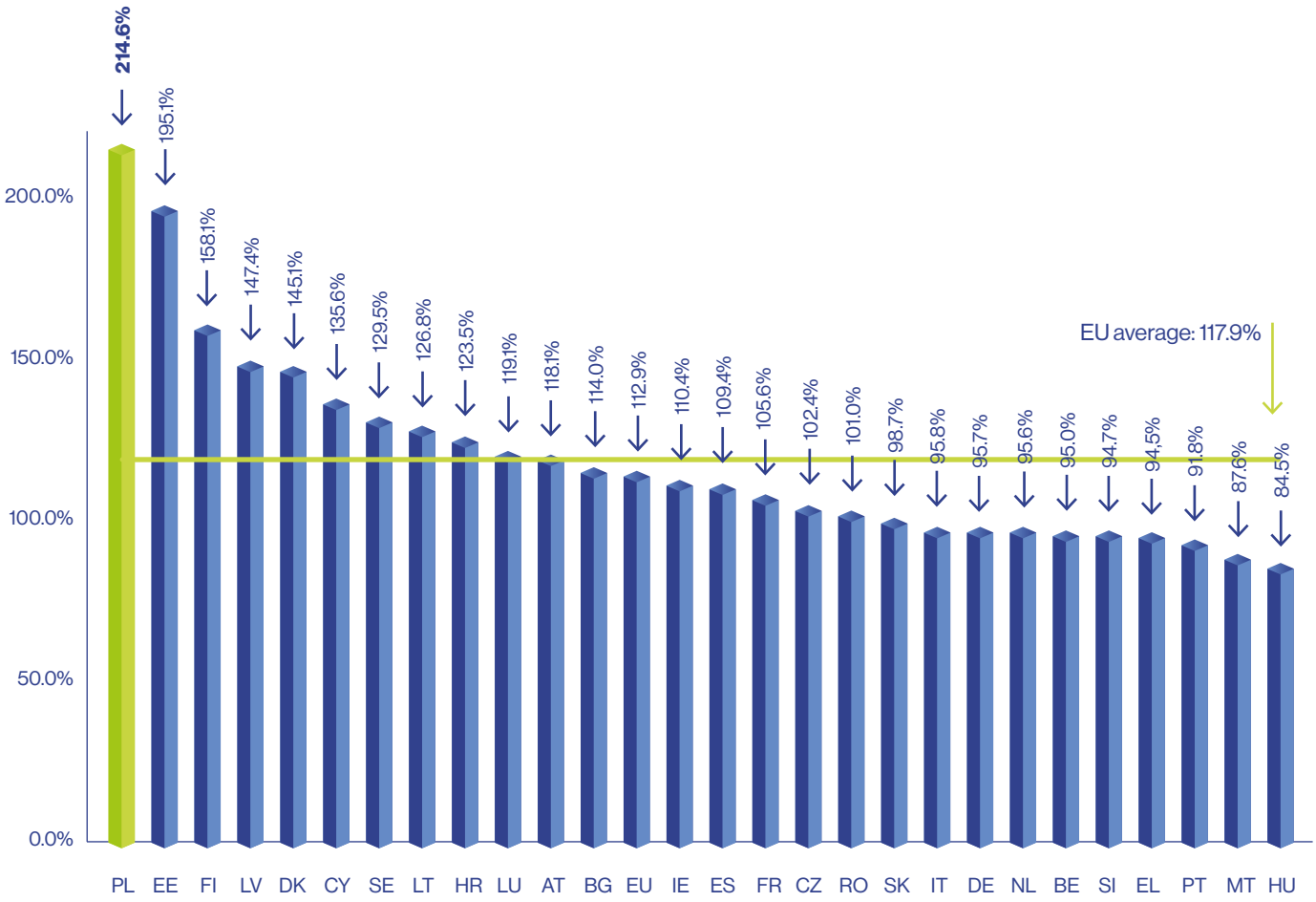
3.2.2.5 | Comparison with European countries

The poor penetration score for fixed access in Poland is compensated for by the saturation rate for mobile access services (all types of access).
In 2022, Poland, following the pattern of previous years, achieved the best result in this respect among the EU countries. Mobile Internet penetration in Poland in 2022 calculated by the EC was 214,6%.[24] This represents an increase of 15 percentage points over 2021. Penetration in Poland was higher than the EU average by as much as 96.7 percentage points.

Poland is followed by Estonia, which in 2022 covered 195.1% of the population with mobile Internet access. Finland ranked third (158.1%). The lowest result was recorded by Hungary (84.5%), Malta (87.6%) and Portugal (91.8%).

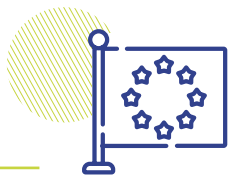
[23] All forms of mobile access include: active SIM cards in mobile networks actually used for voice service, dedicated data transmission offers for additional voice service bundles that require an extra fee, and dedicated data transmission offers for services sold separately and provided solely via cards/modems/keys (e.g. USB modems, PCMCIA cards, ExpressCard).
[24] Data as of 1 July 2022.

Figure 65
Mobile Internet service penetration in the EU (per 100 inhabitants) in 2022



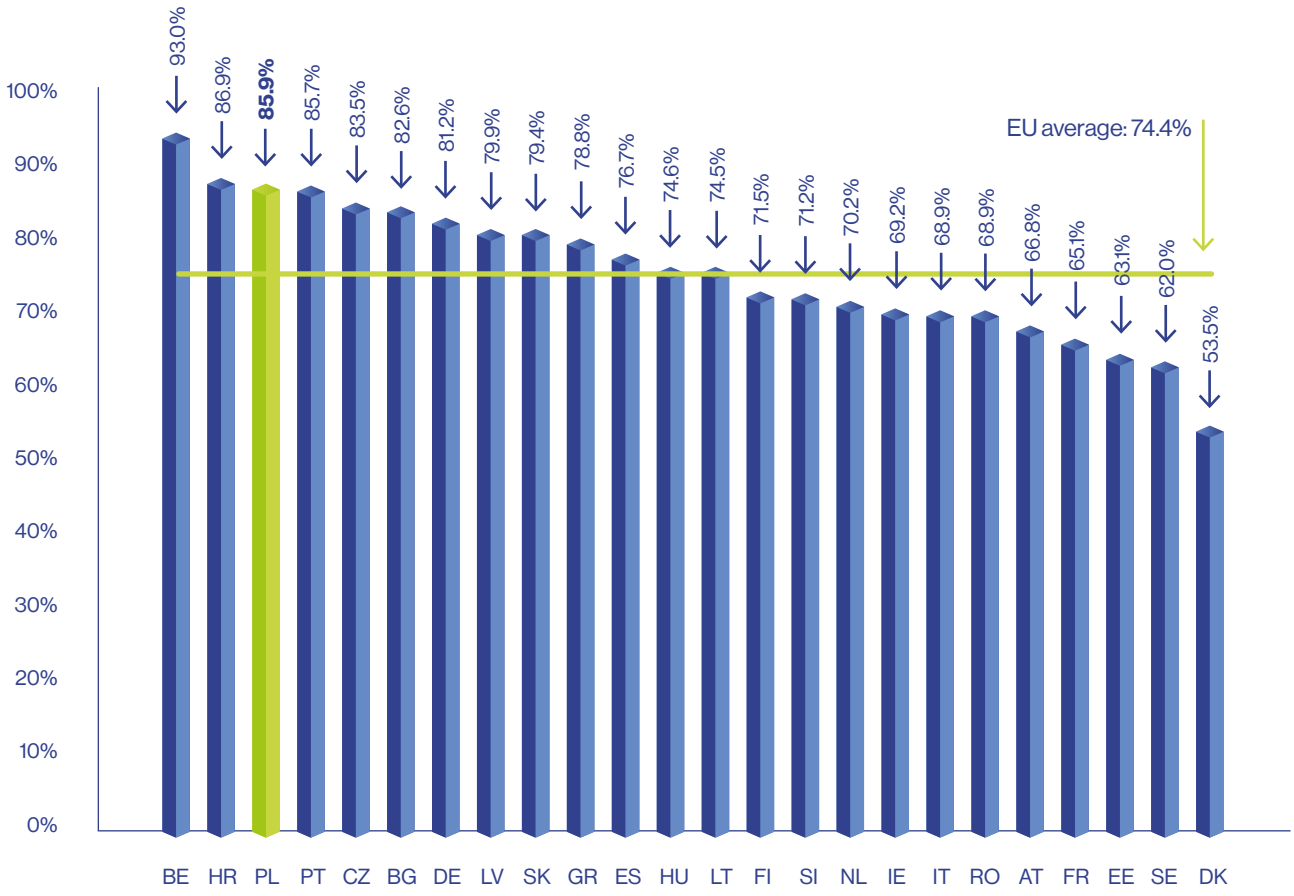
Source: Digital Agenda Scoreboard, July 2022
Note: The European Commission's penetration data differs from the UKE's due to the reporting period and calculation methodology. The European Commission's data is as of 1 July 2022, while the UKE's data is presented as of 31 December 2022. In addition, the Commission distinguishes 3 types of mobile access: 1) actually used active SIM cards in mobile networks, 2) dedicated data transmission offers for additional voice service bundles that require an extra fee, and 3) dedicated data transmission offers for services sold separately and provided solely via cards/modems/keys (e.g. USB modems, PCMCIA cards, ExpressCard). The UKE's mobile Internet access reporting form lists the type of access number 2) and 3) as well as "others" accesses.

Highest mobile Internet access penetration in the EU



In terms of 4G's share of mobile Internet access, Poland ranked third (85.9%). In this regard, Poland was surpassed only by Belgium (93.0%) and Croatia (86.9%).

Figure 66
Share of 4G in mobile access in EU countries in 2022



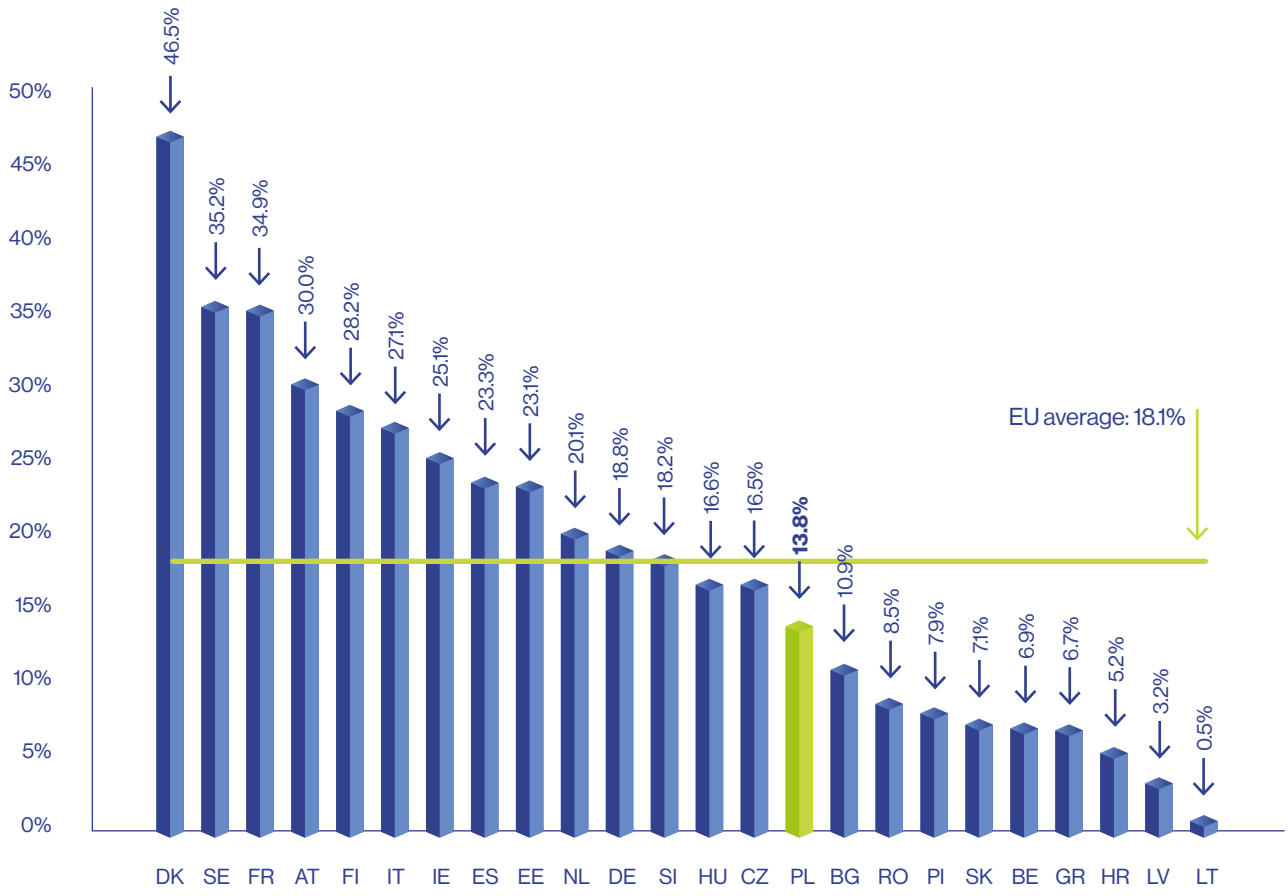
Source: the DataHub database maintained by Analysys Mason

Analysys Mason data further shows that in 2022 in Poland, 13.8% of mobile access users enjoyed 5G25 access, while the EU average was 18.1%.

Denmark had the highest score in this regard (46.5%), while the least developed 5G technology was reported in Lithuania (0.5%).

[25] In Poland, access to such a network, due to the lack of resolution of the auction of the relevant frequencies, is not yet implemented in the C-band (3480-3800 MHz).

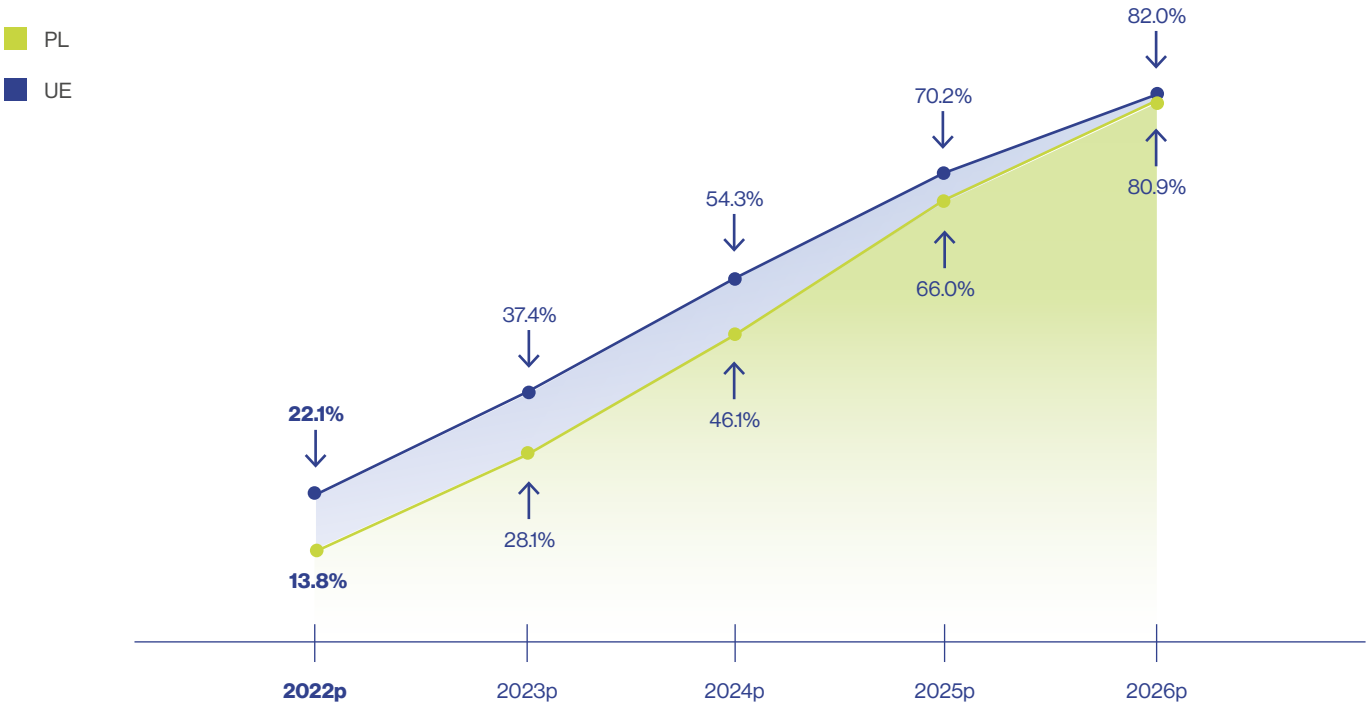
Figure 67
Share of 5G in mobile access in EU countries in 2022



Source: the DataHub database maintained by Analysys Mason

According to Analysys Mason forecasts, 5G's share of mobile access in EU countries will grow rapidly, and by 2026 could reach as much as 82% of total mobile access. It is also predicted that our country will quickly develop 5G. The results for Poland will get closer and closer to the EU results. In 2026, 80.9% of the population in Poland should benefit from the 5G access.

Figure 68
Comparison of the share of 5G technology in the number of mobile connections[26] used to provide Internet access services in Poland and the EU average (prognosis)



Source: DataHub database maintained by Analysys Mason
p - prognosis
*data for 2022 was presented by Analysys Mason as a prognosis due to the fact that the publication was prepared in Q2 2022.

3.3 | Bundled services

A bundled service is defined as a service consisting of two or more telecommunications services that are provided in the market as a single common offer at a single price and usually billed on a single account. However, if the first two conditions are met, and for certain technical reasons separate bills are issued for the individual components of the service, such a service is also treated as a bundled service. The essence of a bundled service is:

- lower price for this service than the aggregate cost of the individual services included in it if they were purchased individually, or
- more favourable conditions for the provision of one or more of its constituent services.

The report contains information on bundled services consisting of the following number of single services:

- double play,
- triple play,
- quadruple play,
- quintuple play,
- sextuple play.

[26] Analysys Mason defines 5G as a service with at least 1 Gbps per user, implemented for data transmission or a low-latency service for IoT, which uses an extended range of spectrum bands (600-700 MHz and 3.5-70 GHz). Active subscribers are taken into account, i.e. those who will use a mobile account in the last 3 months of a given year.

3.3.1 | General information

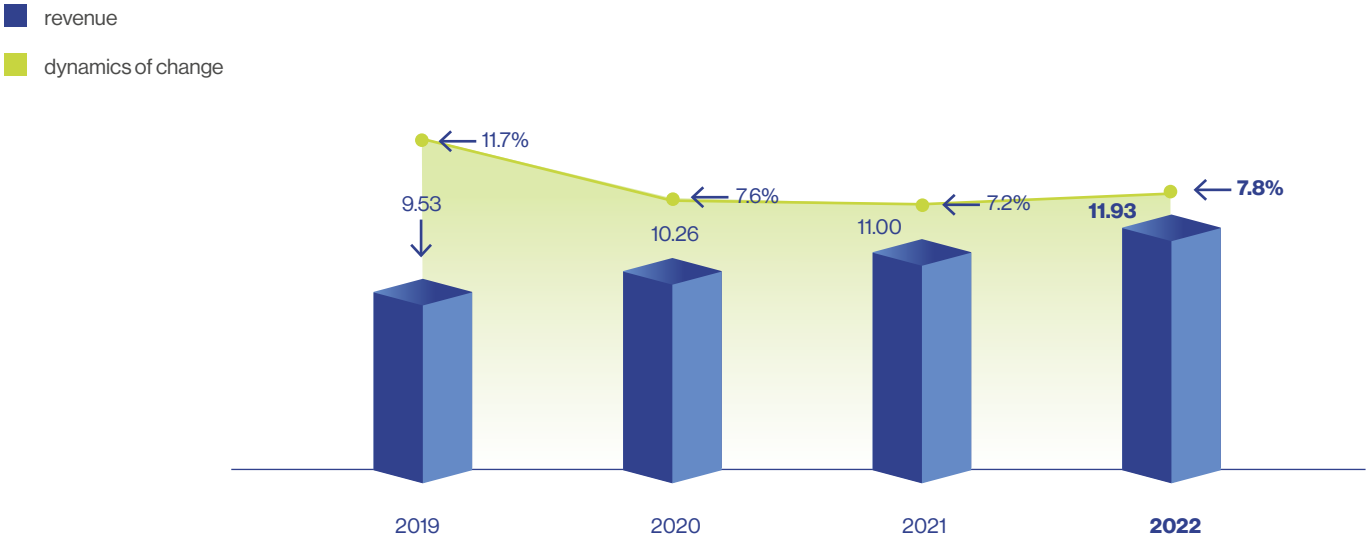
In 2022, the telecommunications bundled services market in Poland was worth PLN 11.93 billion. The number of subscribers remained higher, at 13.92 million, up 3.6%, compared to the previous year.

76.6% of all bundled service users opted for a double play package. In 2022, the popularity for individual packages did not vary significantly compared to previous years. The operator with the largest number of bundled service users was P4 (35.9% of the bundled services market), but its shares, compared to the previous year, fell by 2.9 percentage points.

3.3.2 | Revenues

In 2022, total revenue from the bundled services market increased by 7.8% compared to the previous year and amounted to PLN 11.93 billion. In the last year, the dynamics of revenue changes of bundled services increased by 0.6 percentage points relative to 2021.

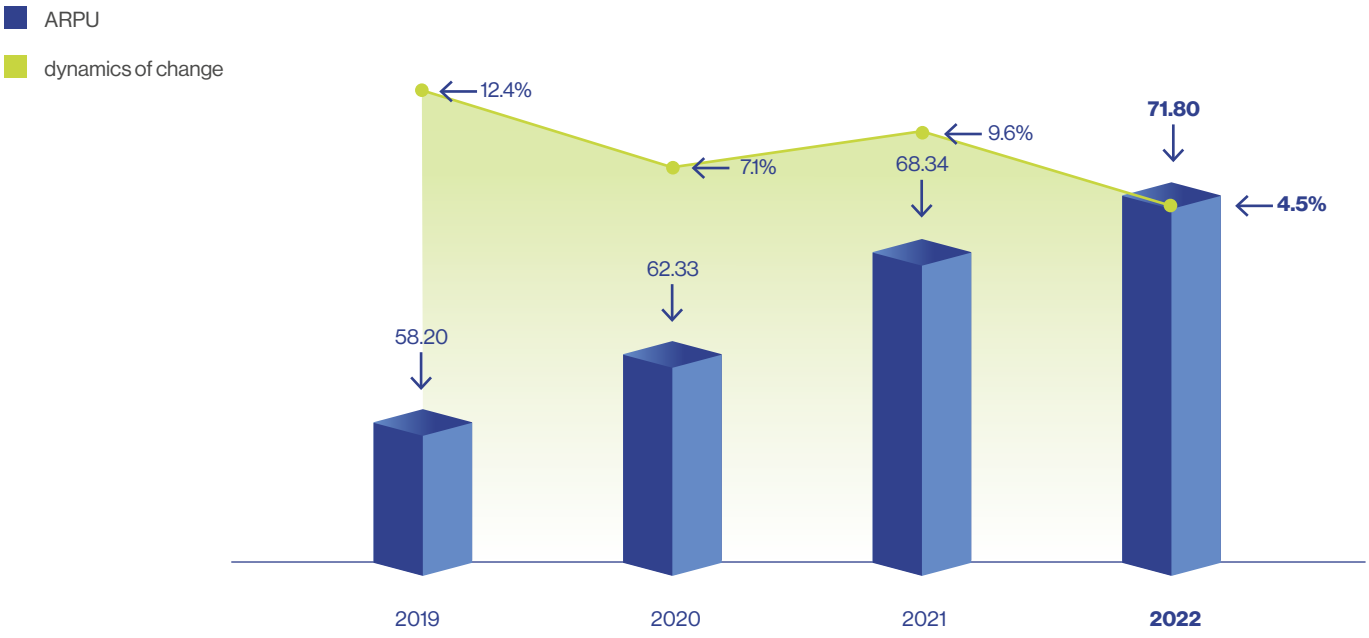
Figure 69
Revenue from the market (PLN billion) and dynamics of change



Source: databases maintained by UKE on the basis of reporting under Article 7 of the Telecommunications Act

In 2022, as in the previous years, the average monthly revenue per bundled service subscriber (ARPU) also increased in line with the revenue growth. In total, for the entire bundled services market, monthly ARPU in 2022 amounted to PLN 71.80, that is 4.5% more than in 2021.

Figure 70
Average monthly revenue per subscriber (PLN) and dynamics of change

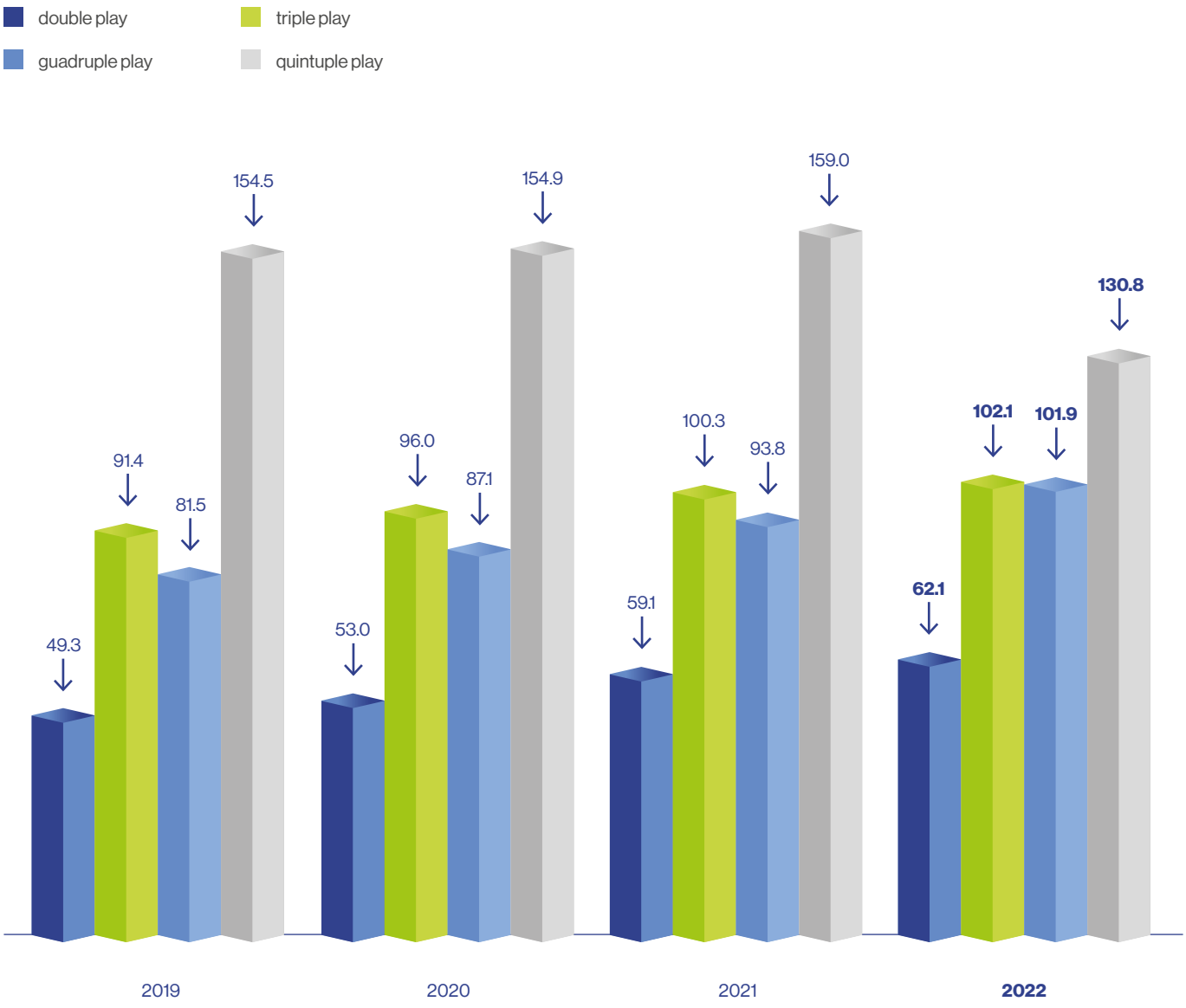


Source: databases maintained by UKE on the basis of reporting under Article 7 of the Telecommunications Act

In 2022, average monthly revenue per subscriber (ARPU) increased for double play (3.0%), triple play (1.8%) and quadruple play (8,1%) packages. Only quintuple play packages saw a 28.2% decrease in average monthly revenue per subscriber compared to the previous year.

PLN 71.8 average monthly revenue per subscriber of bundled services

Figure 71
Average monthly revenue per subscriber of bundled services by service package (in PLN)



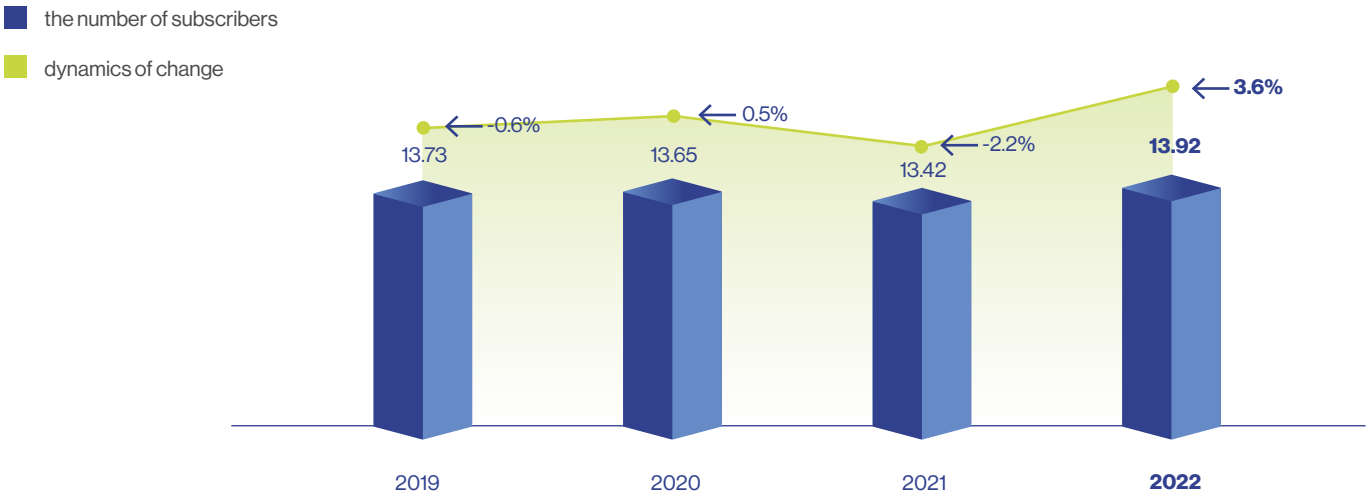
Source: databases maintained by UKE on the basis of reporting under Article 7 of the Telecommunications Act

3.3.3 | Users

The number of bundled service subscribers in Poland in 2022 has increased compared to previous years. In 2022, a total of 13.92 million subscribers used bundled services, 3.6% more than in 2021.

13.9 million subscribers of bundled services in Poland

Figure 72
The number of bundled services users (in millions) and dynamics of change



Source: databases maintained by UKE on the basis of reporting under Article 7 of the Telecommunications Act

In 2022, the most popular service bundles were "Mobile telephony + Mobile Internet" (45.2%) and "Fixed Internet + TV" (15.2%). There was a decrease in shares of 2.1 percentage points for the first package. In contrast, interest in the second most popular package increased by 2.8 percentage points compared to 2021. In third place was "Mobile Telephony + TV" (8.9%), up 0.3 percentage points compared to the previous year. This was followed by "Mobile telephony + Mobile Internet + TV" (6.2%) and "Mobile telephony + Fixed Internet + TV + VoIP telephony" (5.9%). In 2022, the number of users of the aforementioned packages compared to 2021 decreased, by 0.8 and 0.6 percentage points, respectively. In 2022, interest in the "Fixed telephony + Fixed Internet + TV" package decreased (3.8% - down 0.3 percentage points). "Mobile telephony + Fixed Internet + Mobile Internet" (2.8%) remained at the same level as in the previous year. Compared to the previous year, the share of "Mobile telephony + Fixed Internet" decreased (2.6%, down 0.3 percentage points). In 2022, interest in "Mobile Internet + TV" declined once again (2.0%, down 0.3 percentage points). The following packages stayed at a similar level as in 2021: "Fixed Internet + TV + VoIP telephony" and "Fixed Internet + VoIP telephony," 1.4% and 1.2%, respectively.

In 2022, the "Mobile telephony + Fixed Internet + TV" package saw an increase in interest – 1.2%, by 0.4 percentage points. The other packages accounted for 3.6% of subscribers to all bundled services.

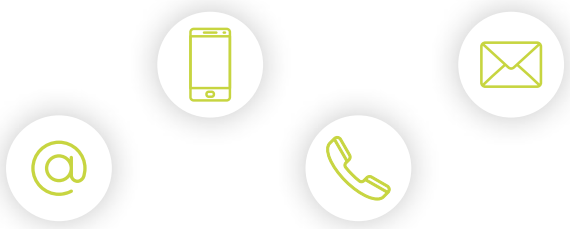
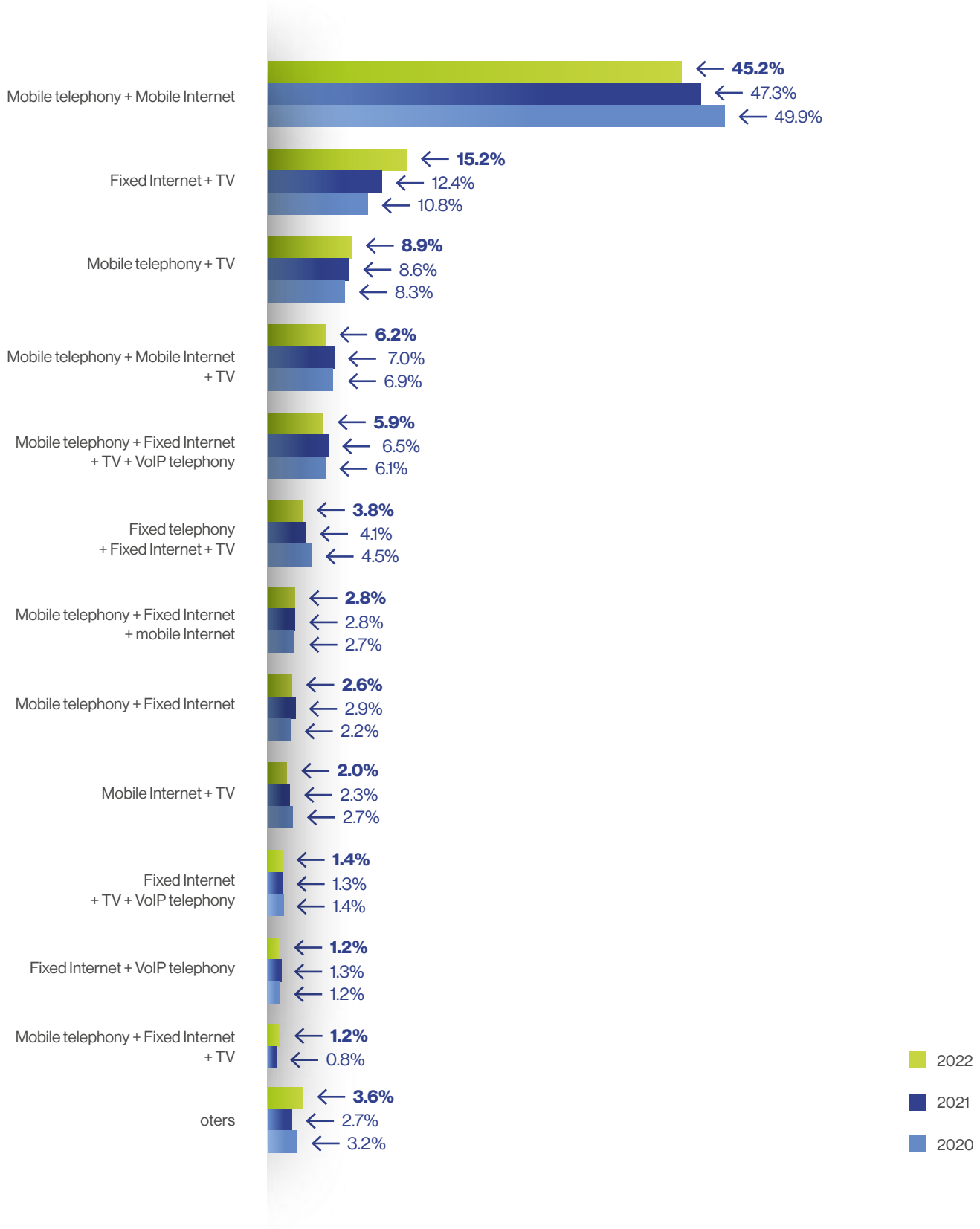


Figure 73
Share of bundles in terms of the number of subscribers



Source: databases maintained by UKE on the basis of reporting under Article 7 of the Telecommunications Act
Other – packages having a unit share of less than 1%

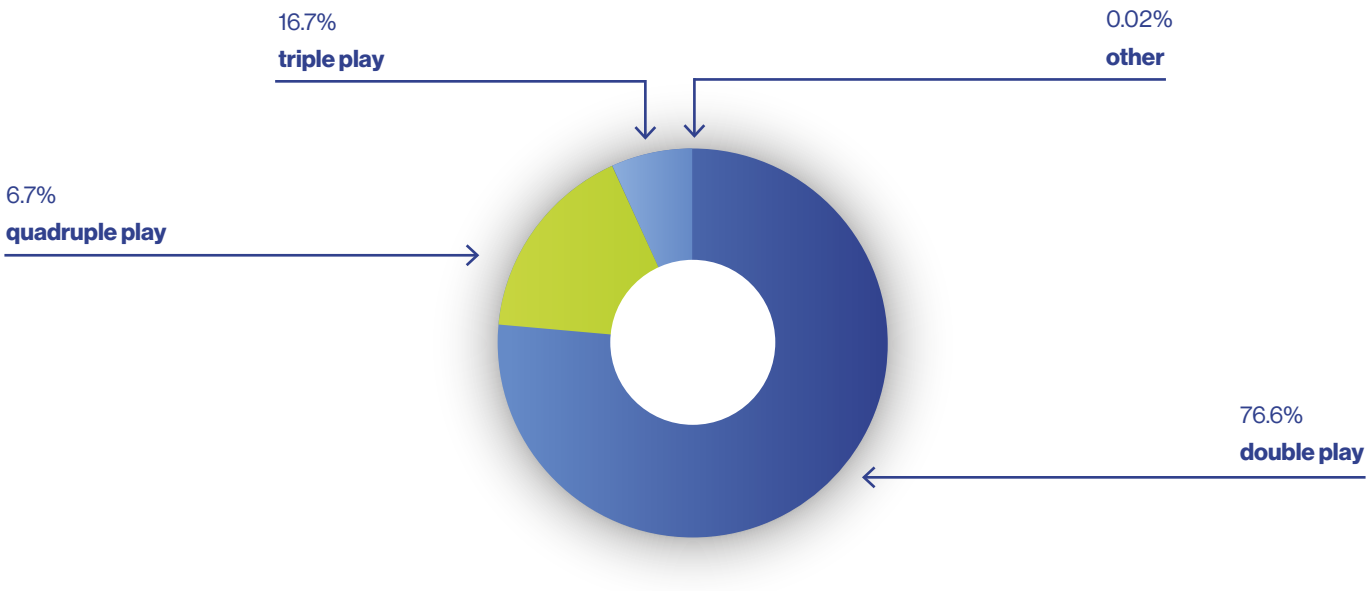
In 2022, the subscriber structure in terms of the type of bundled service package has not changed much compared to previous years. The majority of the bundled services market customers (76.6%) chose a double play package. This was followed by triple play (16.7%) and quadruple play (6.7%) bundles. Other packages are rarely offered by service providers and their popularity is marginal. In 2022, they were used by 0.02% of bundled service subscribers.

2022

76.6%

users choose double play packages

Figure 74
Share of bundles in terms of the number of subscribers

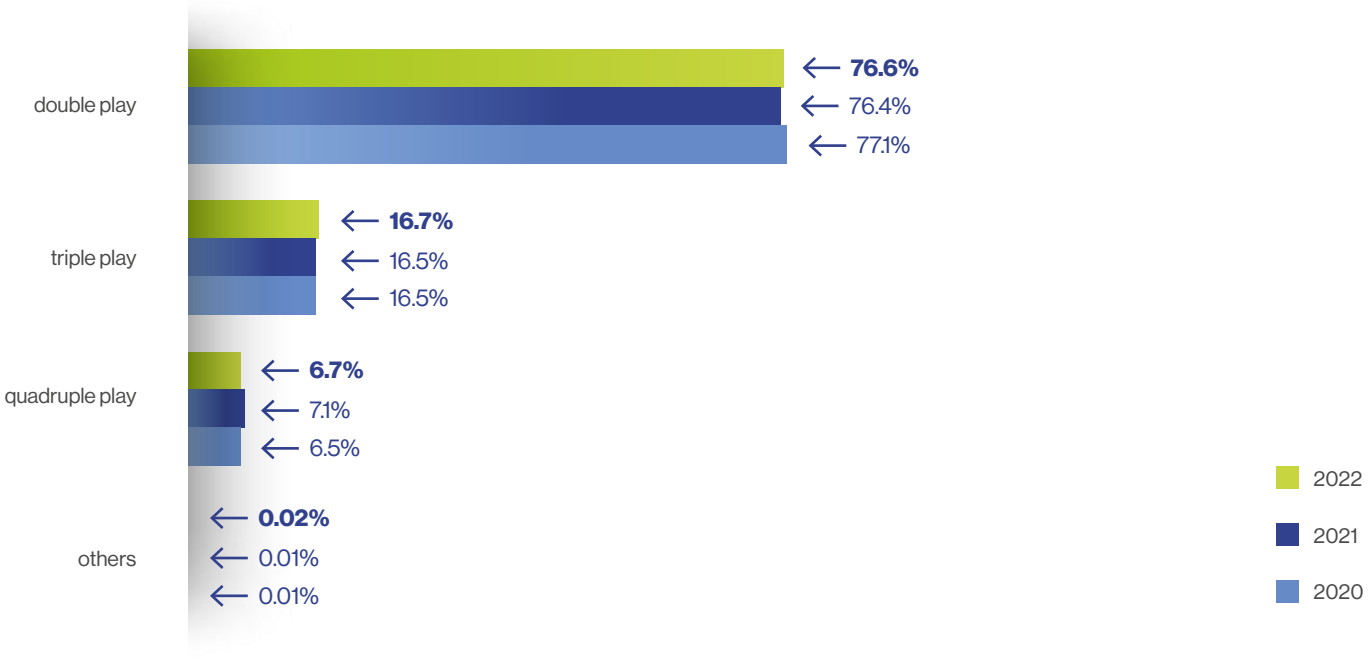


Source: databases maintained by UKE on the basis of reporting under Article 7 of the Telecommunications Act
Other – quintuple and sextuple play bundled service packages

In 2022, double play was the dominant bundled service package, and as in previous years, the share of these services in the overall bundled services market reached 76.6%.

In 2022, triple play and quadruple play packages reached a market share of 16.7% and 6.7%, respectively.

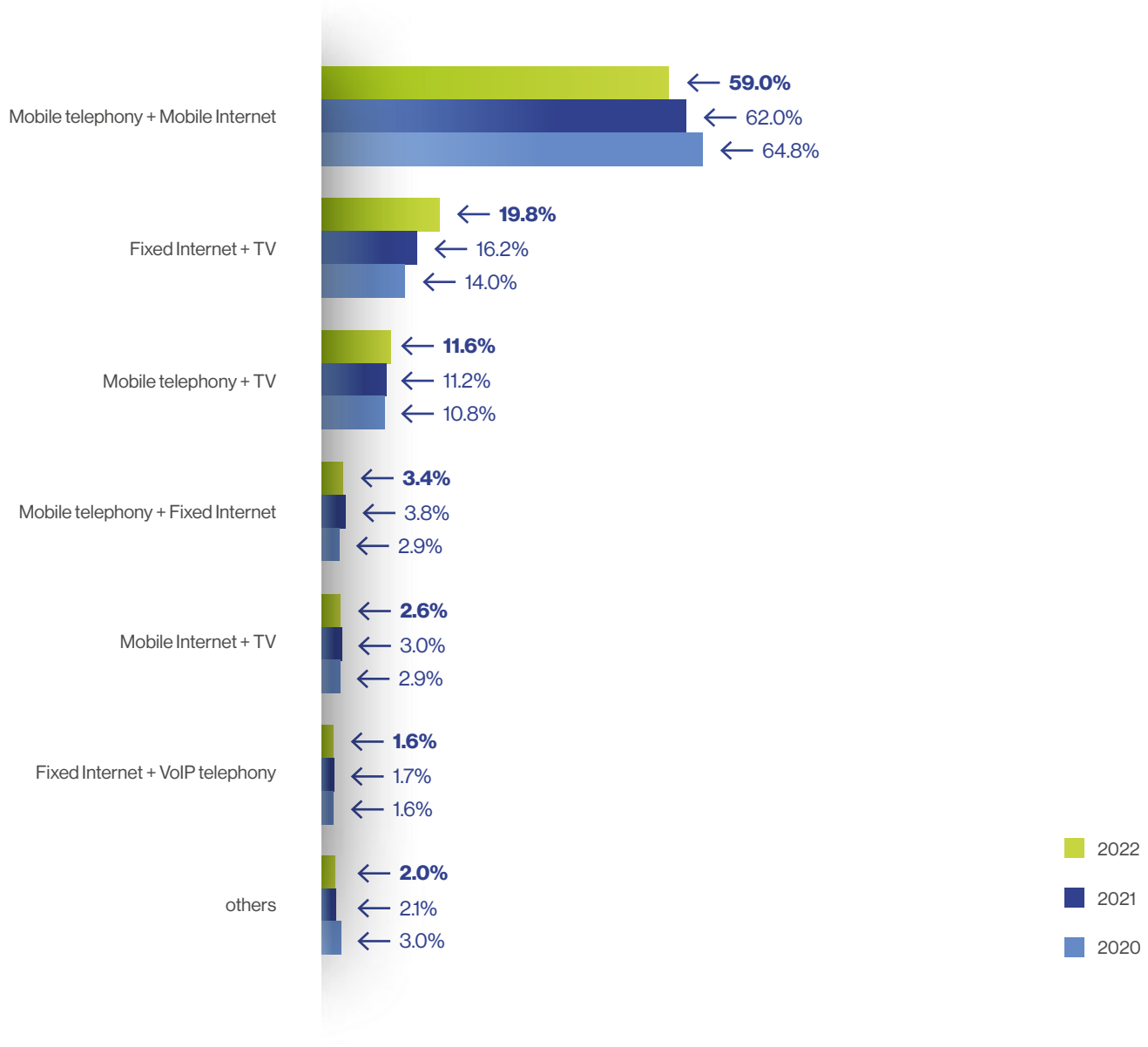
Figure 75
Shares of bundled service packages in terms of subscribers by year



Source: databases maintained by UKE on the basis of reporting under Article 7 of the Telecommunications Act

In 2022, among bundled double play service packages, the majority of subscribers chose the "Mobile telephony + Mobile Internet" package (59.0%), but compared to 2021 its popularity declined by 3.0 percentage points. The second most popular package was "Fixed Internet + TV" (19.8%), whose popularity increased by 3.6 percentage points compared to the previous year. Among double play services, the "Mobile telephony + TV" package (11.6%), which also gained in popularity among subscribers (up 0.4 percentage points), ranked third.

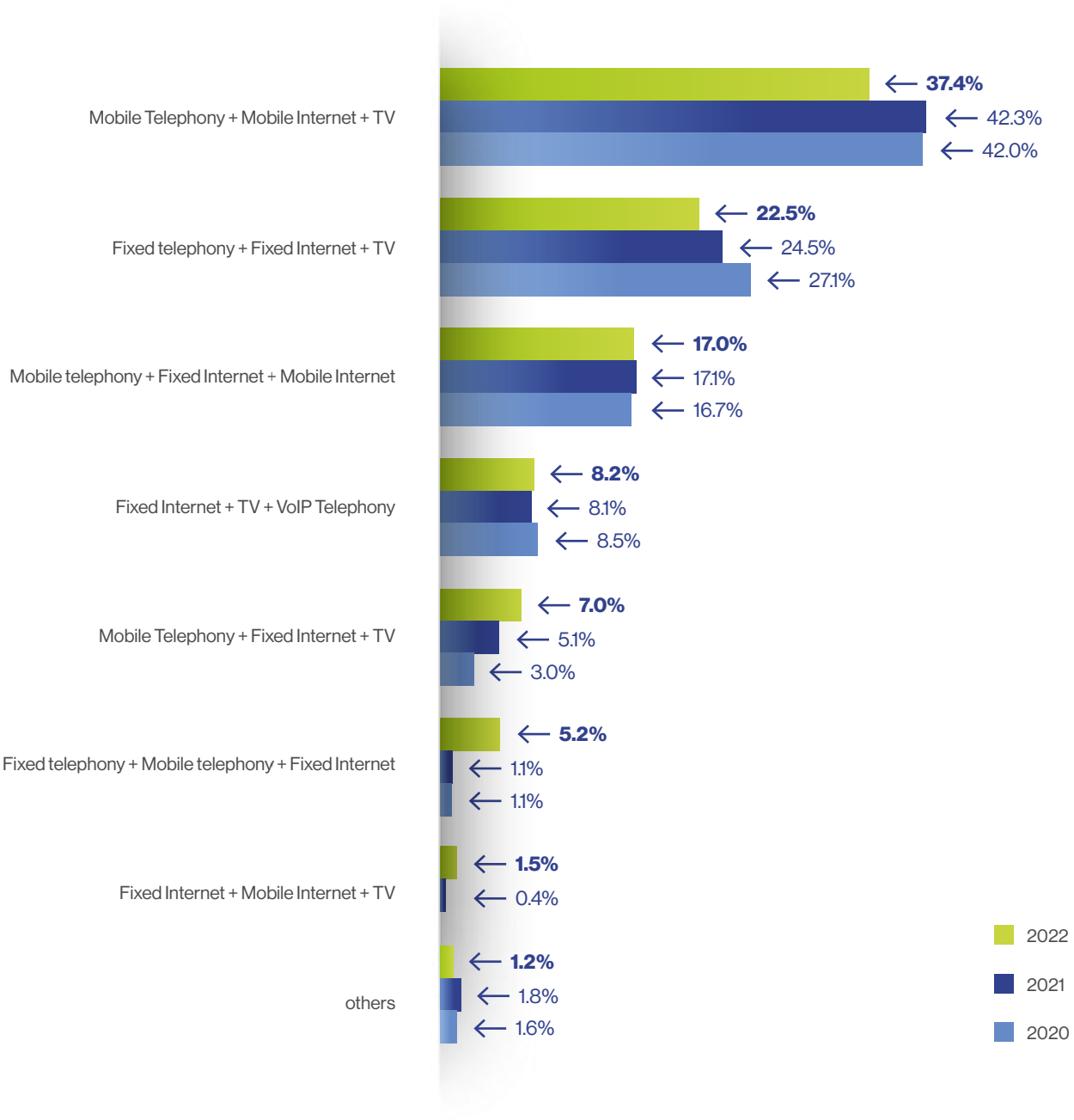
Figure 76
Shares of individual double play packages in terms of the number of subscribers



Source: databases maintained by UKE on the basis of reporting under Article 7 of the Telecommunications Act
Other – packages having a unit share of less than 1%

Among the triple play packages, "Mobile telephony + Mobile Internet + TV" ranked first with 37.4% (up 4.9 percentage points compared to 2021). Second place with a share of 22.5% went to "Fixed telephony + Fixed Internet + TV" (down 2.0 percentage points). That was followed by "Mobile telephony + Fixed Internet + Mobile Internet" (17.0%) and "Fixed Internet + TV + VoIP telephony" (8.2%). In 2022, the "Fixed telephony + Mobile telephony + Fixed Internet" package recorded a relatively large increase compared to the previous year's result (up 4.1 percentage points to 5.2%).

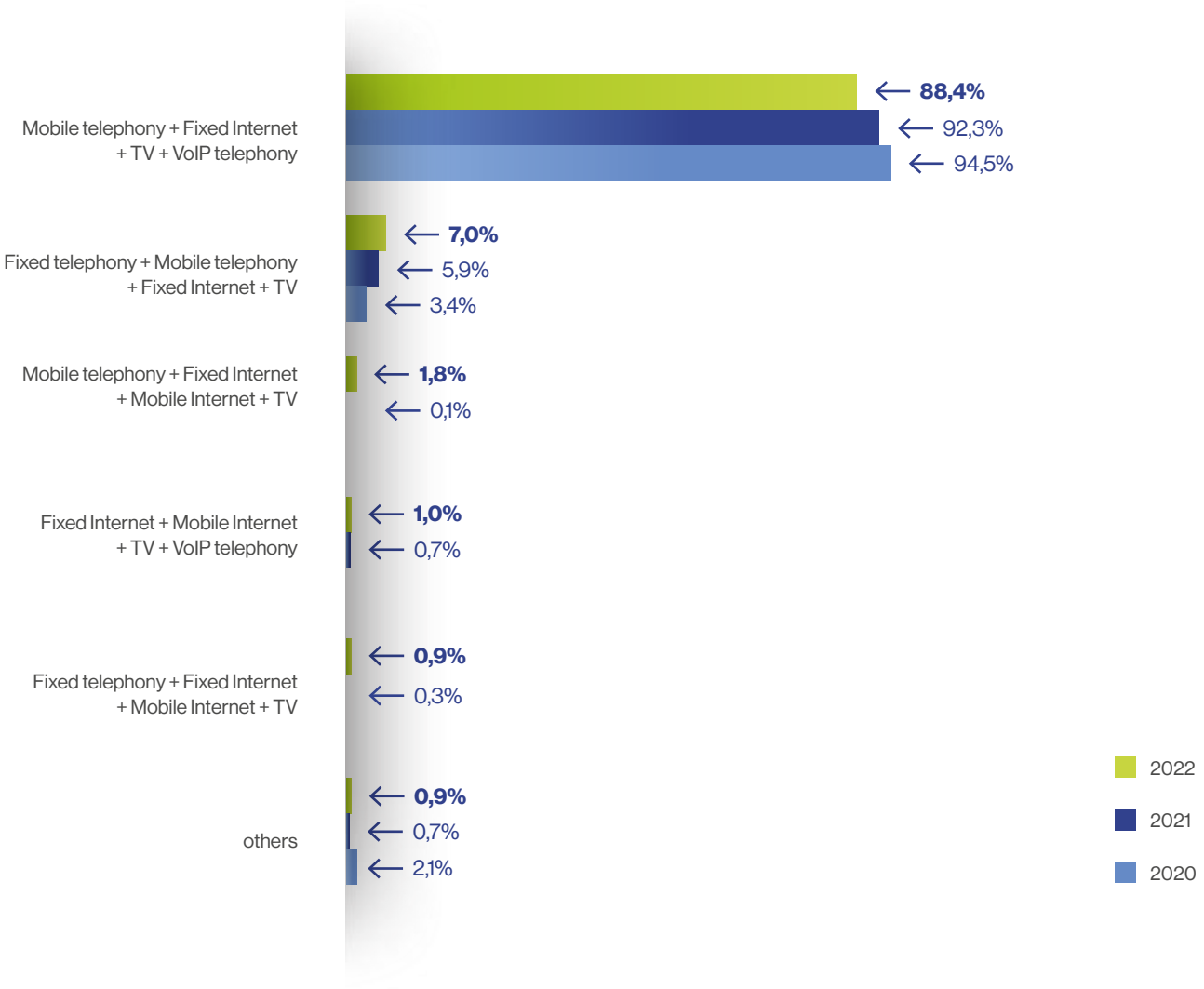
Figure 77
Shares of individual triple play packages in terms of the number of subscribers



Source: databases maintained by UKE on the basis of reporting under Article 7 of the Telecommunications Act
Other – packages having a unit share of less than 1%

In 2022, "Mobile telephony + Fixed Internet + TV + VoIP telephony" was the most popular package among quadruple play offers in terms of the number of subscribers. It was chosen by 88.4% fewer users, i.e. down by 3.9 percentage points compared to the previous year. In second place was the "Fixed telephony + Mobile telephony + Fixed Internet + TV" (7.0% with an increase of 1.1 percentage points).

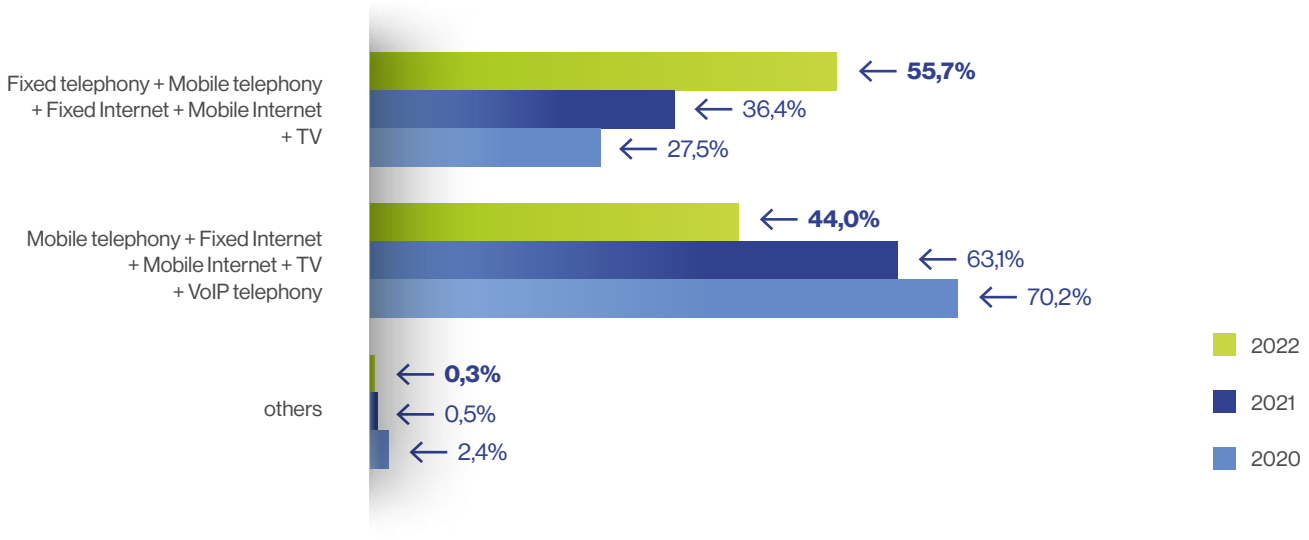
Figure 78
Shares of individual quadruple play packages in terms of the number of subscribers



Source: databases maintained by UKE on the basis of reporting under Article 7 of the Telecommunications Act
Other – packages having a unit share of less than 1%

In 2022, the share of quintuple play packages has changed. Migration of subscribers from the "Mobile telephony + Fixed Internet + Mobile Internet + TV + VoIP telephony" package, which began in 2021, continued. Its share decreased by 19.1 percentage points in comparison to "Fixed telephony + Mobile telephony + Fixed Internet + Mobile Internet + TV" (an increase of 19.3 percentage points).

Figure 79
Shares of individual quintuple play packages in terms of the number of subscribers

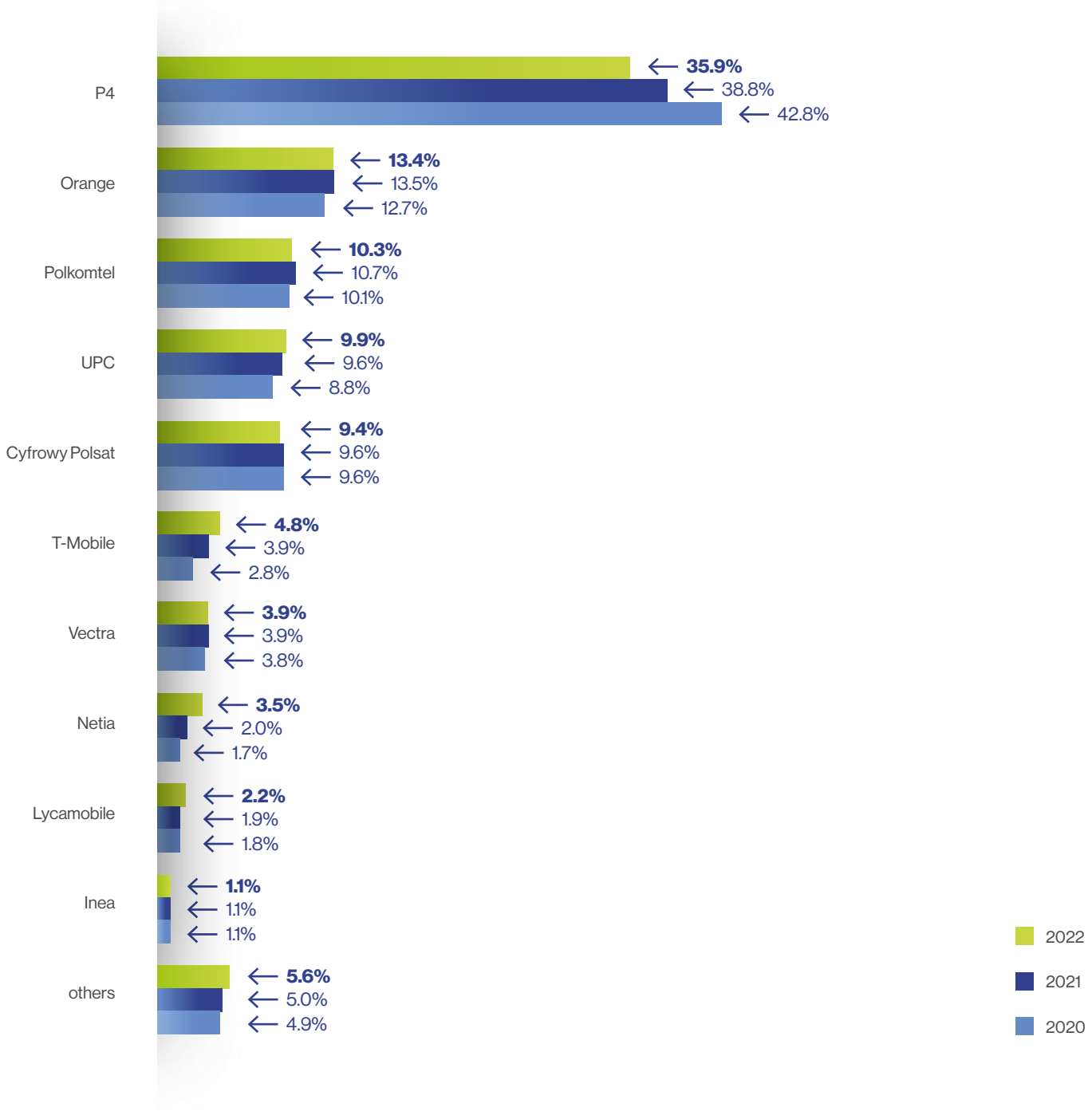


Source: databases maintained by UKE on the basis of reporting under Article 7 of the Telecommunications Act
Other – packages having a unit share of less than 1%

In 2022, P4 had the largest number of bundled service subscribers (35.9% - down by 2.9 percentage points compared to 2021). Orange had 13.4% of subscribers, while Polkomtel had fewer subscribers by 0.4 percentage points and recorded a share of 10,3%. UPC increased its customer group to almost 9.9%, and Cyfrowy Polsat lowered its share to 9.4%. Increase in the number of customers buying bundled services in 2022 was recorded by T-Mobile, Netia and Lycamobile, up to 4.8%, 3.5% and 2.2%, respectively. Shares at the previous year's level were maintained by Vectra and Inea, at 3.9% and 1.1%, respectively. The share of other entrepreneurs in the bundled services market was 5.6%, up 0.6 percentage points compared to the previous year.

Figure 80

Shares of operators in terms of the number of bundled services subscribers

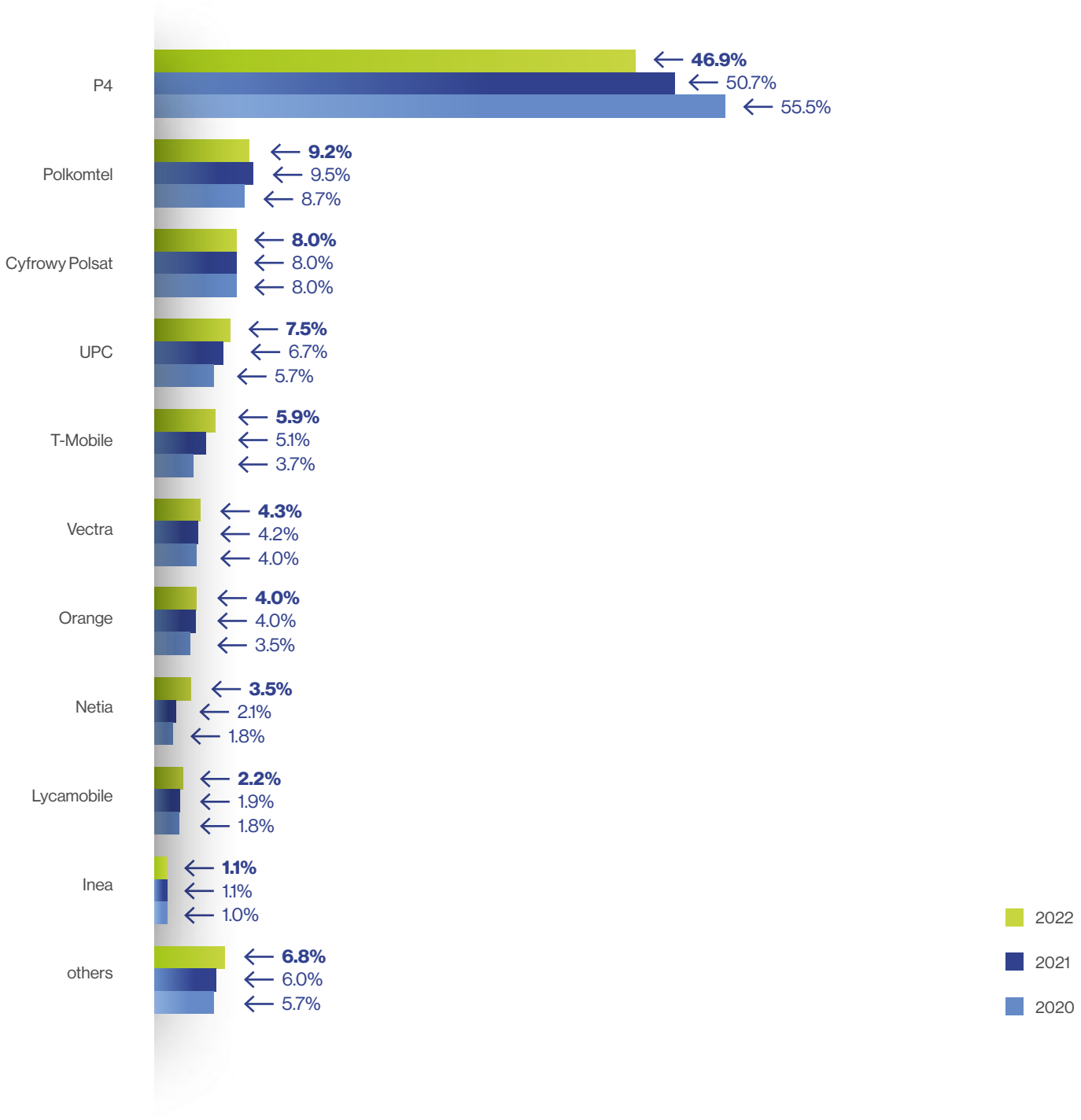


Source: databases maintained by UKE on the basis of reporting under Article 7 of the Telecommunications Act
Other – packages having a unit share of less than 1%

P4 held the largest share in terms of the number of double play package subscribers in 2022 (46.9%), but its share fell by 3.8 percentage points compared to 2021. Polkomtel had the second largest share at 9.2% of subscribers, and Cyfrowy Polsat was third – at 8.0%. UPC increased its subscriber group by 0.8 percentage points to 7.5%. Compared to 2021, T-Mobile and Netia recorded an increase, acquiring 5.9% and 3.5% of users, respectively, up 0.8 and 1.4 percentage points from the previous year.

Figure 81

Shares of operators in terms of the number of bundled services subscribers – double play

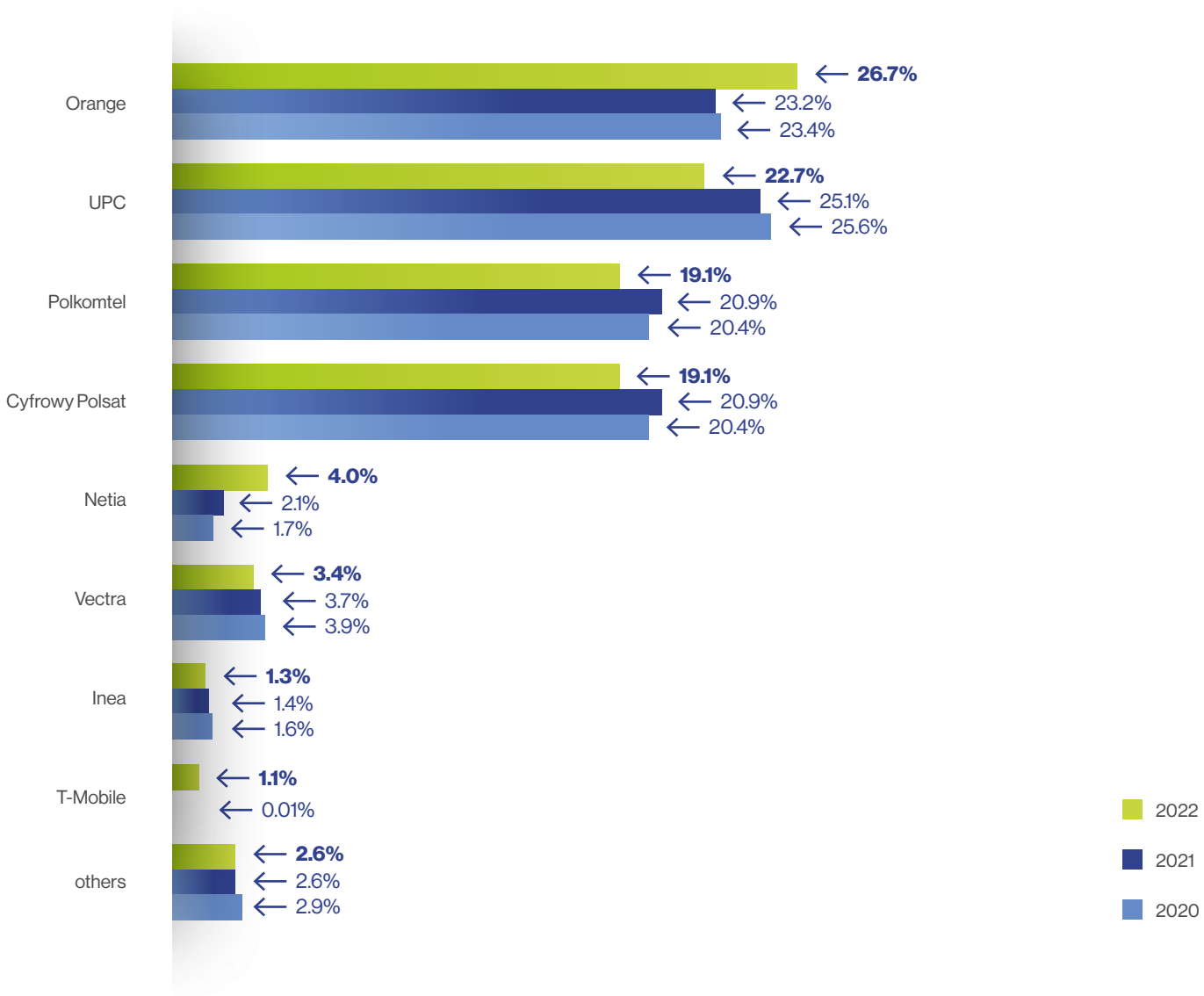


Source: databases maintained by UKE on the basis of reporting under Article 7 of the Telecommunications Act
Other – entrepreneurs with a unit share of less than 1%

In 2022, Orange (26.7% of subscribers, up 3.5 percentage points) led the way among operators offering triple play services. It was followed by UPC (22.7%, down by 2.4 percentage points) as well as Polkomtel and Cyfrowy Polsat (19.1% each, respectively, down by 1.8 percentage points). Increase in the number of subscribers was recorded by Netia, with a 4.0% increase of 1.9 percentage points, and T-Mobile with 1.1%. Vectra (3.4%) and Inea (1.3%) reported a decrease in the number of subscribers to the triple play bundle.

Figure 82

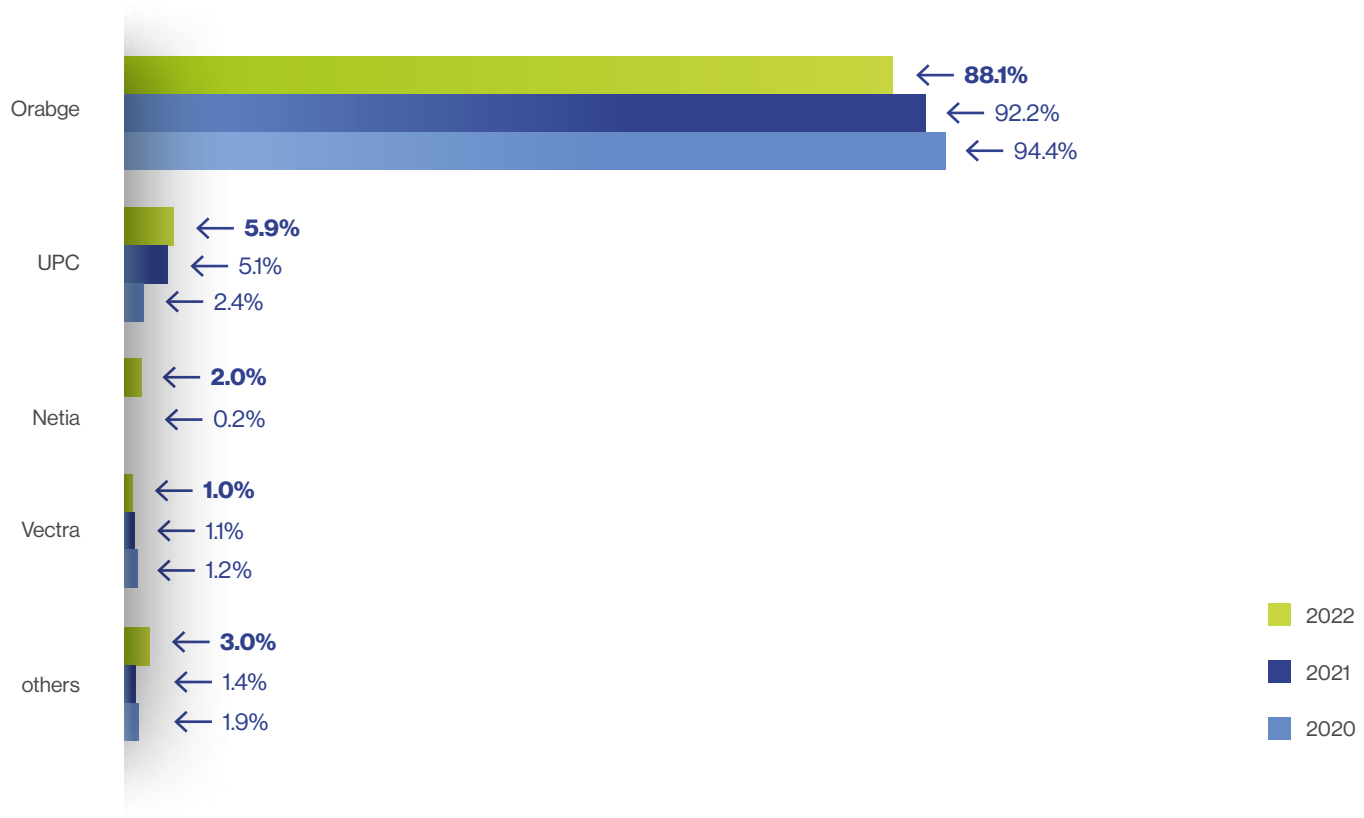
Shares of operators in terms of the number of bundled services subscribers – triple play



Source: databases maintained by UKE on the basis of reporting under Article 7 of the Telecommunications Act
Other – entrepreneurs with a unit share of less than 1%

In 2022, among operators offering quadruple play packages, by far the largest market share in terms of the number of subscribers invariably belonged to Orange 88.1% with a decline of 4.1 percentage points. Growth was recorded by UPC, which increased its shares by 0.8 percentage points to 5.9%, and Netia, which increased its shares by 1.8 percentage points to 2.0%. Vectra, which ranked fourth, amassed 1.0% of the total quadruple play users.

Figure 83
Shares of operators in terms of the number of bundled services subscribers – quadruple play



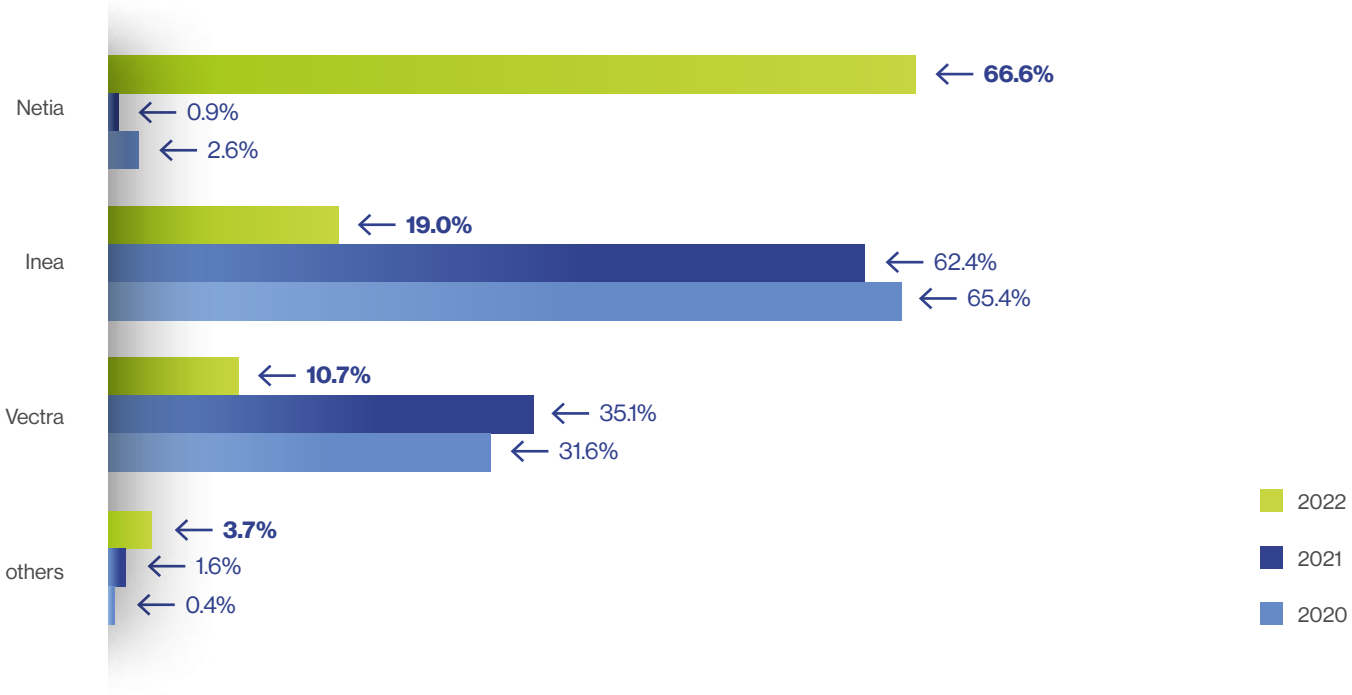
Source: databases maintained by UKE on the basis of reporting under Article 7 of the Telecommunications Act
Other – entrepreneurs with a unit share of less than 1%

In 2022, among operators offering quintuple play packages, the largest share belonged to Netia (66.6%), an increase of 65.7 percentage points compared to 2021. In contrast, a decrease of 43.4 percentage points was recorded by Inea, which had 19.0% of subscribers in 2022. Vectra also recorded significantly fewer users compared to 2021 (10.7% by 24.4 percentage points).

The increase in Netia's volumes in 2022 was due to the company's promotional policy of selling services to its own subscribers, as well as those of its subsidiaries, and the implementation of a project to verify and correlate data from various systems operating within the Netia group.

Figure 84

Shares of operators in terms of the number of bundled services subscribers – quintuple play



Source: databases maintained by UKE on the basis of reporting under Article 7 of the Telecommunications Act
Other – entrepreneurs with a unit share of less than 1%

3.4 | Paid TV services

3.4.1 | General information

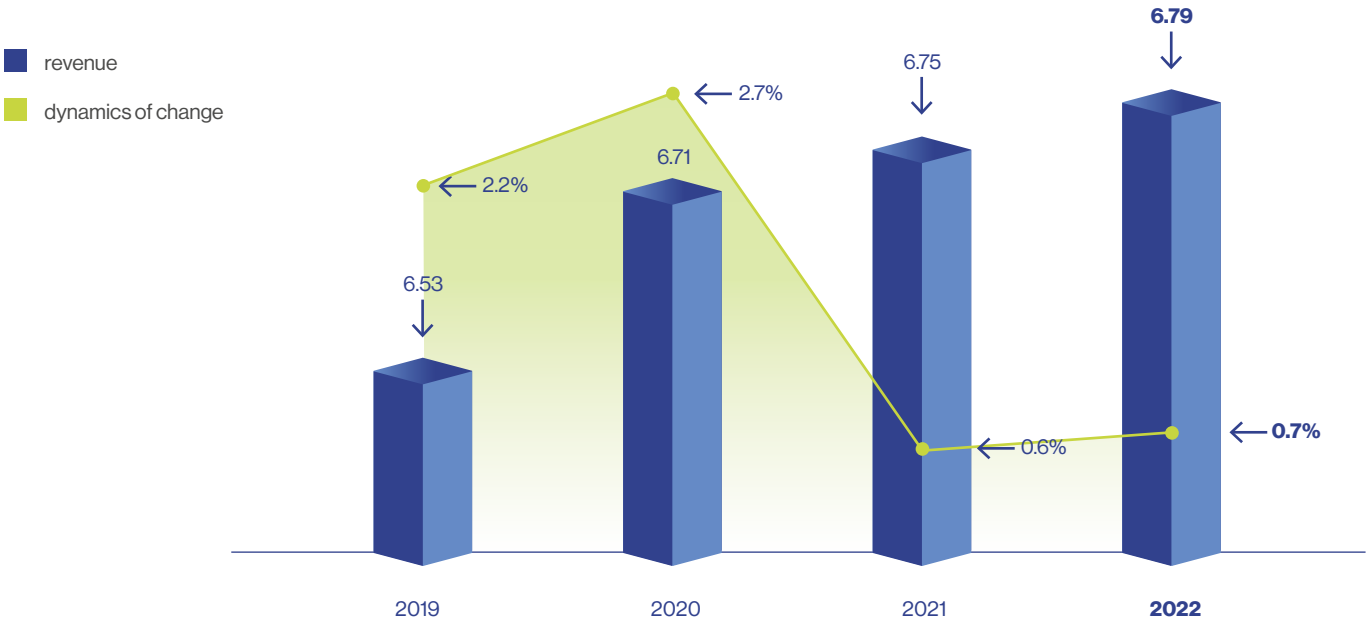
In 2022, the number of users of paid TV services stabilised at 10.83 million, while revenue from the market increased to PLN 6.79 million. 28.1% of the TV services market in terms of the number of users belonged to Cyfrowy Polsat, 19.5% to Canal+ and 13.7% to UPC Polska. Users most often chose satellite TV[27] (47.6%), but IPTV service[28] was becoming increasingly popular, attracting more than 16% of users in 2022.

3.4.2 | Revenues

In 2022, the value of the market for paid TV services was PLN 6.79 billion, an improvement over the previous year; however, the dynamics of change is small, only 0.7% over the previous year.

PLN 6.8 billion
the value of the market for TV services

Figure 85
Revenue from paid TV services (PLN million) and dynamics of change

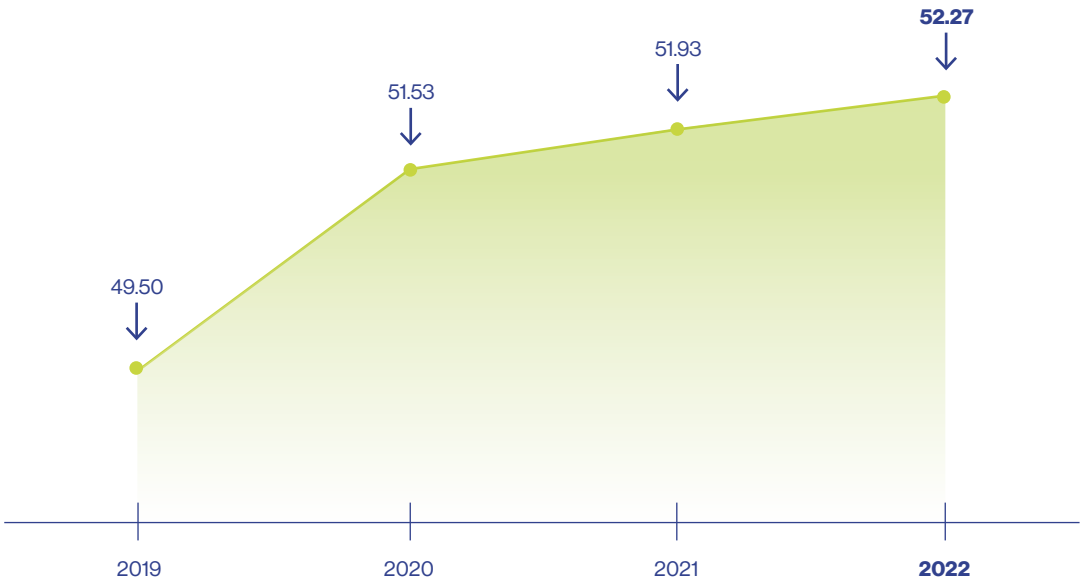


Source: databases maintained by UKE on the basis of reporting under Article 7 of the Telecommunications Act

[27] Satellite TV – television using transmitters (known as transponders) placed on Earth's artificial satellites. The hallmark of this method of broadcasting is the ability to cover huge areas with just one transmitter and the ability to reach areas where it is impossible or unprofitable to set up a network of terrestrial transmitters.
Satellite TV is a system of broadcasting television programmes for reception by individual viewers using simple equipment consisting of a satellite dish and a satellite receiver connected to a standard television set.
[28] IPTV (Internet protocol television) – a technique that allows television signals to be transmitted over IP-based broadband networks. IPTV is a form of digital TV offer that involves delivering video over the Internet and/or Intranet.

In 2022, the average monthly revenue per user (ARPU[29]) was PLN 52.27, which is PLN 0.35 more than in the previous year.

Figure 86
Average monthly revenue per subscriber (ARPU) in PLN

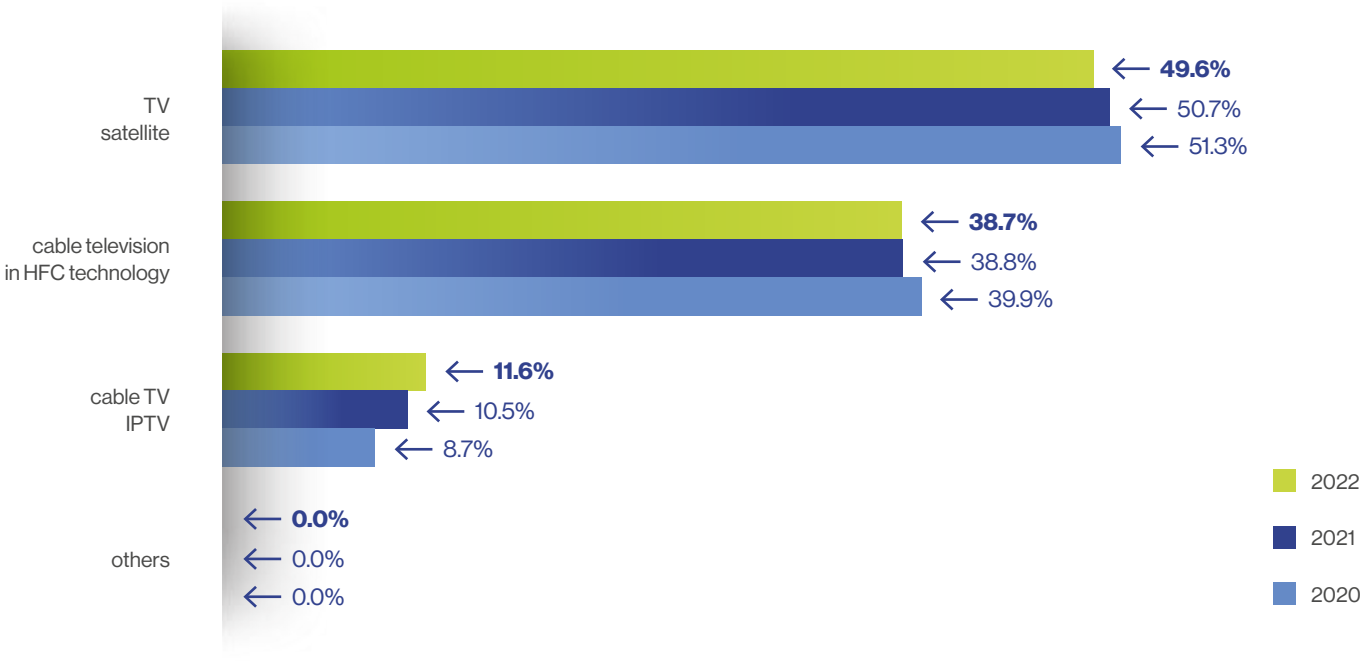


Source: databases maintained by UKE on the basis of reporting under Article 7 of the Telecommunications Act

[29] ARPU (average revenue per user) – a measure used by telecommunication operators, among others, to determine monthly service revenue per network user.

Satellite TV accounted for the largest percentage share of paid TV revenue in 2022 (49.6%), followed by cable TV[30] (38.7%). The IPTV services segment is growing every year. In 2022, revenue from this service reached an 11.6% share of paid TV revenue.

Figure 87
Revenue share by category of paid TV services

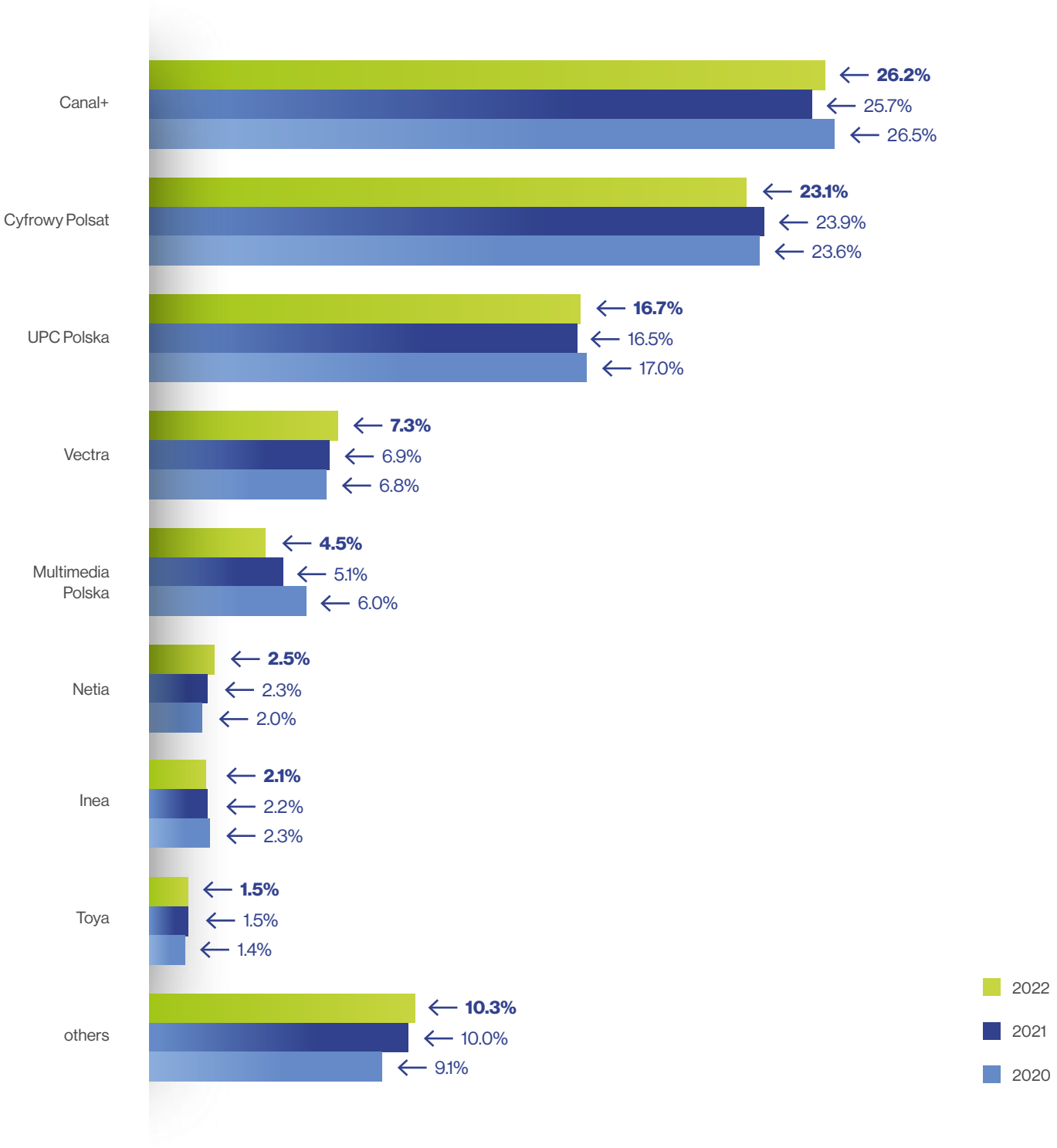


Source: databases maintained by UKE on the basis of reporting under Article 7 of the Telecommunications Act

[30] Cable TV (colloquially "cable") – a telecommunications network that allows to offer subscribers a package of television (and/or radio) programmes and a wide range of interactive multimedia services (i.e., Internet, telephone), usually implemented using HFC (hybrid fiber-coaxial) technology. HFC – an English-language telecommunications term for a hybrid network using a fiber optic medium (fiber) and various types of coaxial cables.

Entities with the largest market share in terms of revenue are invariably: Canal+ (26.2%), Cyfrowy Polsat (23.1%) and UPC Polska (16.7%).

Figure 88
Shares of operators in terms of paid TV services revenue



Source: databases maintained by UKE on the basis of reporting under Article 7 of the Telecommunications Act
Others – entrepreneurs with a unit share of less than 1%

3.4.3 | Users

The number of users of paid TV services in 2022 stabilised at 10.83 million, 4,000 more compared to the previous year.

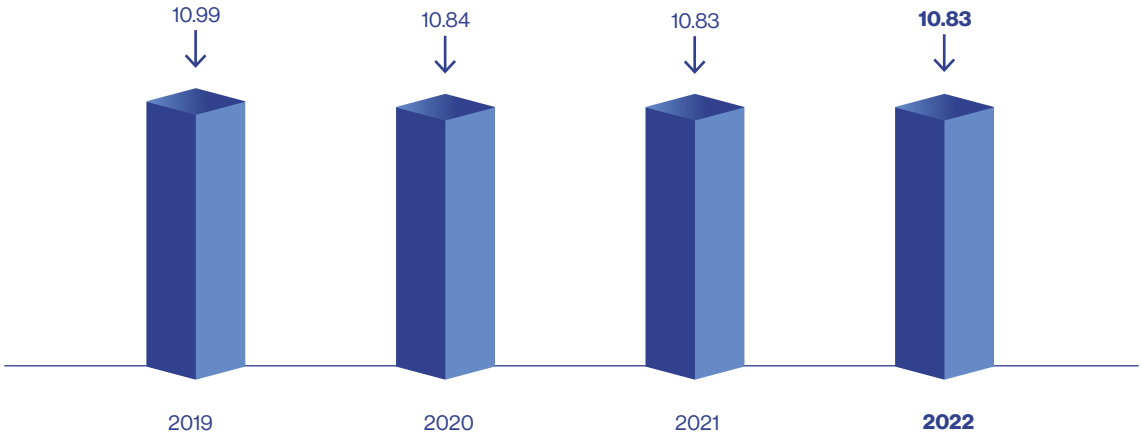
2022

10.8 million

users of paid TV services

Figure 89

Number of users of paid TV services (in millions)

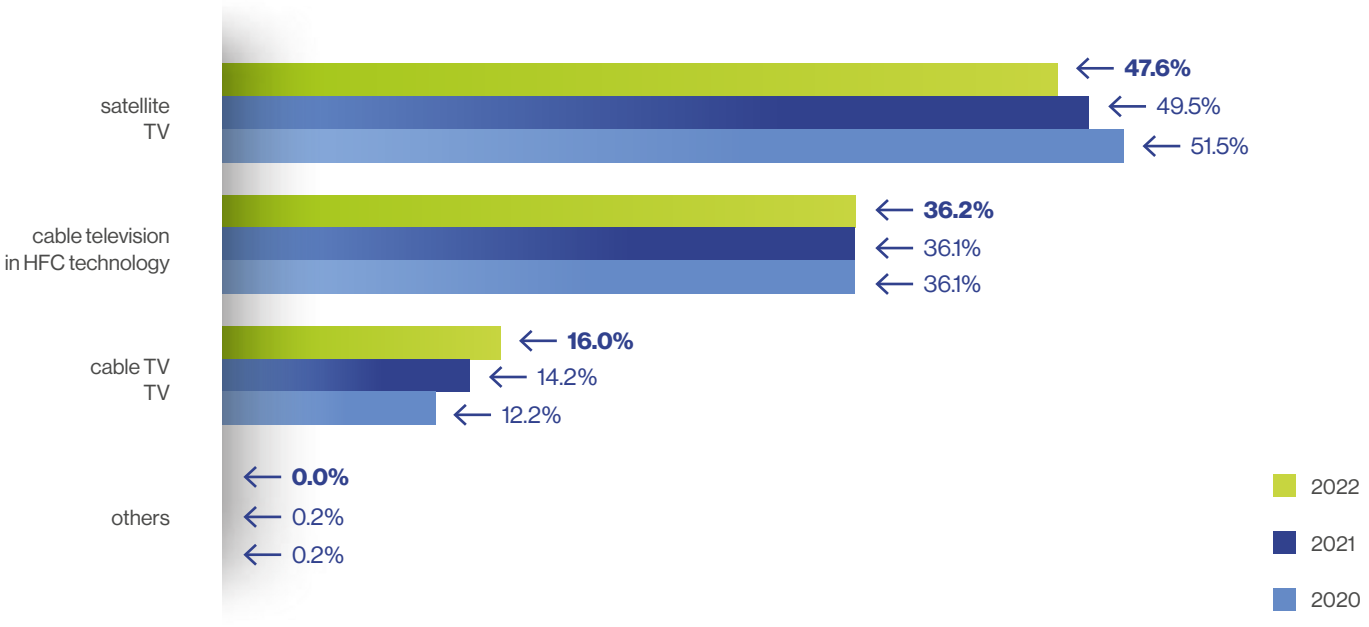


Source: databases maintained by UKE on the basis of reporting under Article 7 of the Telecommunications Act

Satellite TV accounted for the largest percentage of paid TV users in 2022 (47.6%), followed by cable TV (36.2%) and IPTV (16.0%).

Figure 90

Share of number of users in each category of paid TV services

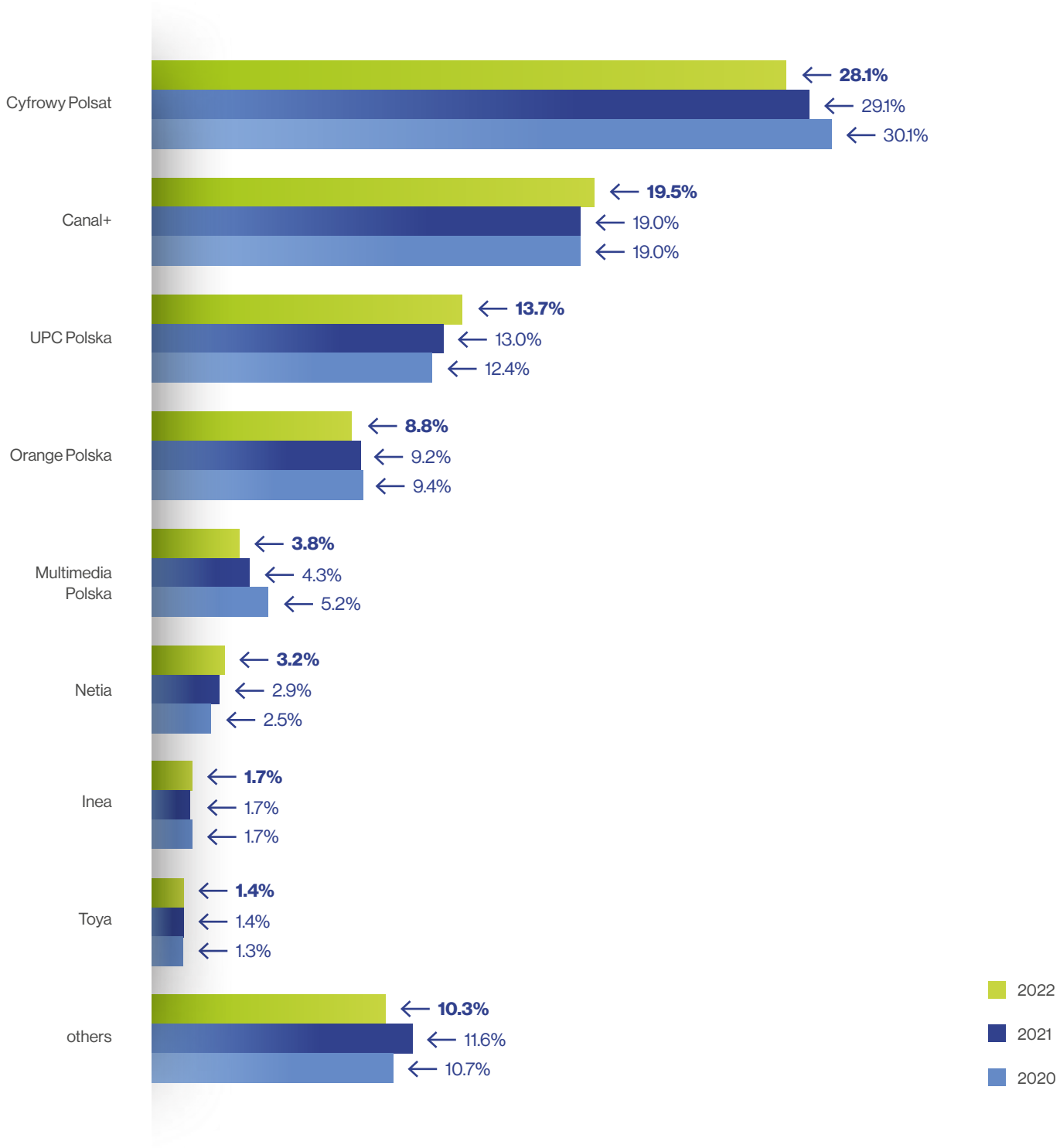


Source: databases maintained by UKE on the basis of reporting under Article 7 of the Telecommunications Act

In terms of the number of users, Cyfrowy Polsat took the highest position in the TV services market. The operator has seen a decline in interest in its services in recent years.

It attracted 28.1% of the market in 2022, down 1 percentage point in comparison to 2021. Canal+ increased its share by 0.5 percentage points to 19.5%. UPC managed to attract 0.7 percentage points more customers and reach a score of 13.7%.

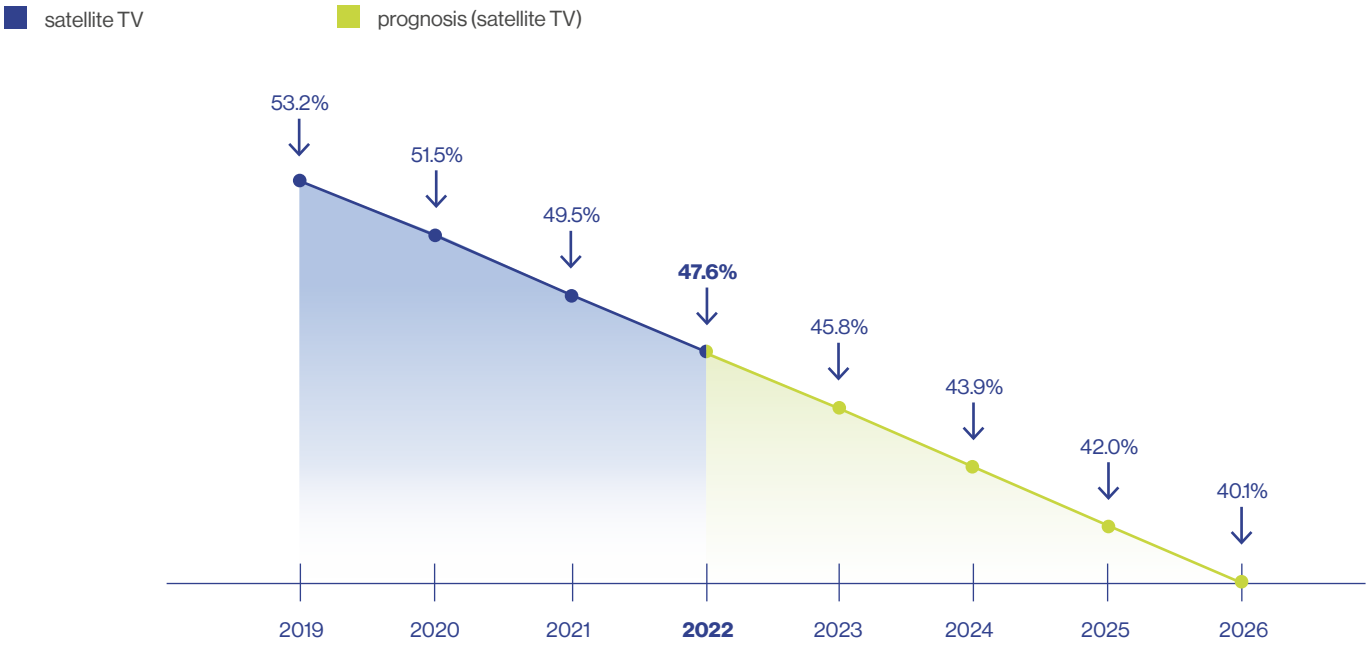
Figure 91
Shares of operators in terms of the number of users of TV services



Source: databases maintained by UKE on the basis of reporting under Article 7 of the Telecommunications Act
others – entrepreneurs with a unit share of less than 1%

According to the forecast[31], by 2026 interest in satellite TV will decrease and there will be an increase in the share of satellite TV in the pay TV market by 7 percentage points (up to 40.1%).

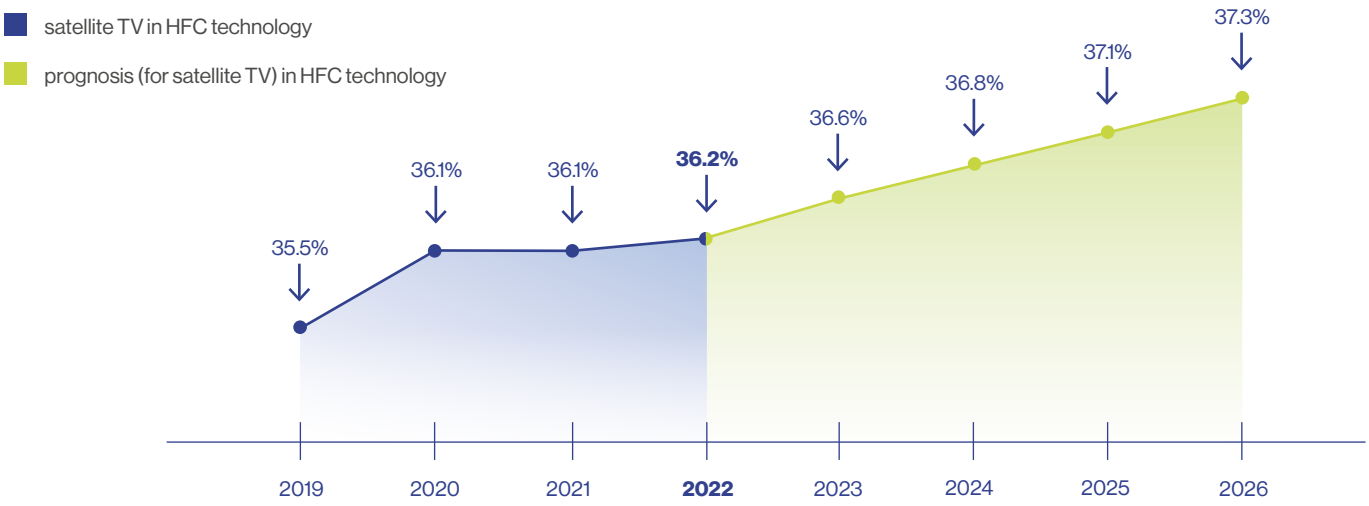
Figure 92
Predicted satellite TV growth in terms of number of users



Source: databases maintained by UKE on the basis of reporting under Article 7 of the Telecommunications Act

It is estimated that the share of cable TV in the pay TV market will be stable. In 2026, interest in the service will be comparable to the current level.

Figure 93
Prognosis of cable television development in terms of the number of users

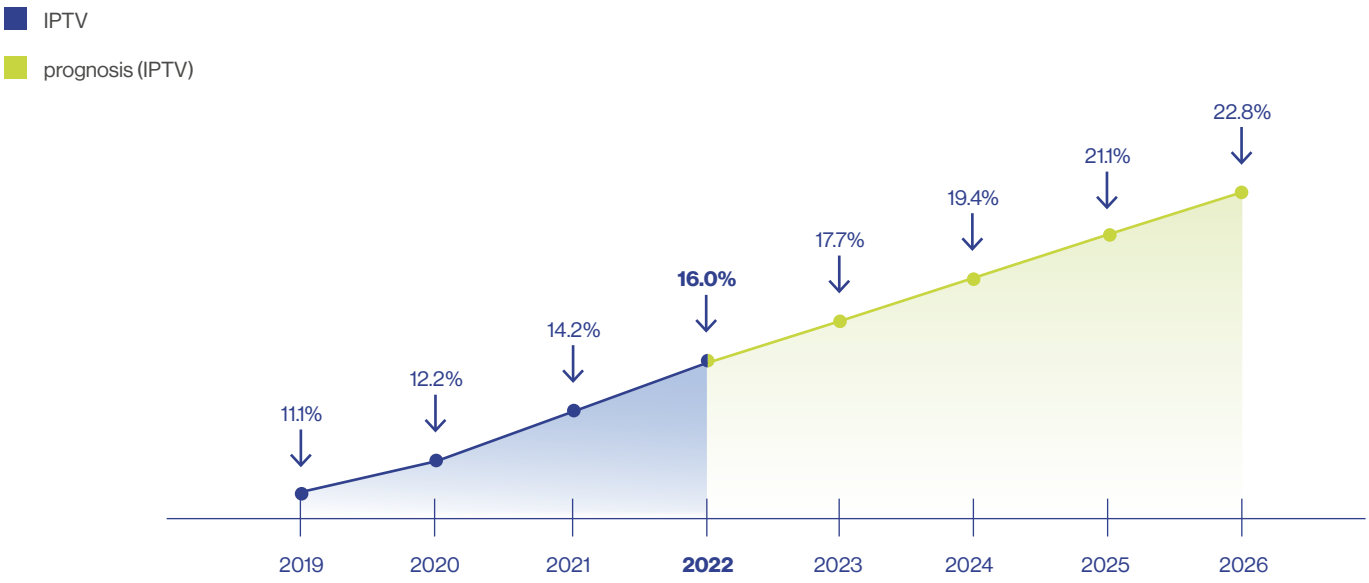


Source: databases maintained by UKE on the basis of reporting under Article 7 of the Telecommunications Act

[31] UKE's prognosis is based on historical data collected under Article 7 of the TL. The prognosis predicts future values based on existing data using a forecasting function, i.e. using the AAA version of the exponential smoothing algorithm (ETS).

Given the upward trend in IPTV, it can be assumed that it will continue in the coming years. In 2026, interest in the service would increase to 22.8%, by 6.8 percentage points higher than in 2022. Considering the upper confidence limit, the prognosis assumes an increase in the number of IPTV users by 7.4 percentage points.

Figure 94
IPTV development forecast in terms of the number of users

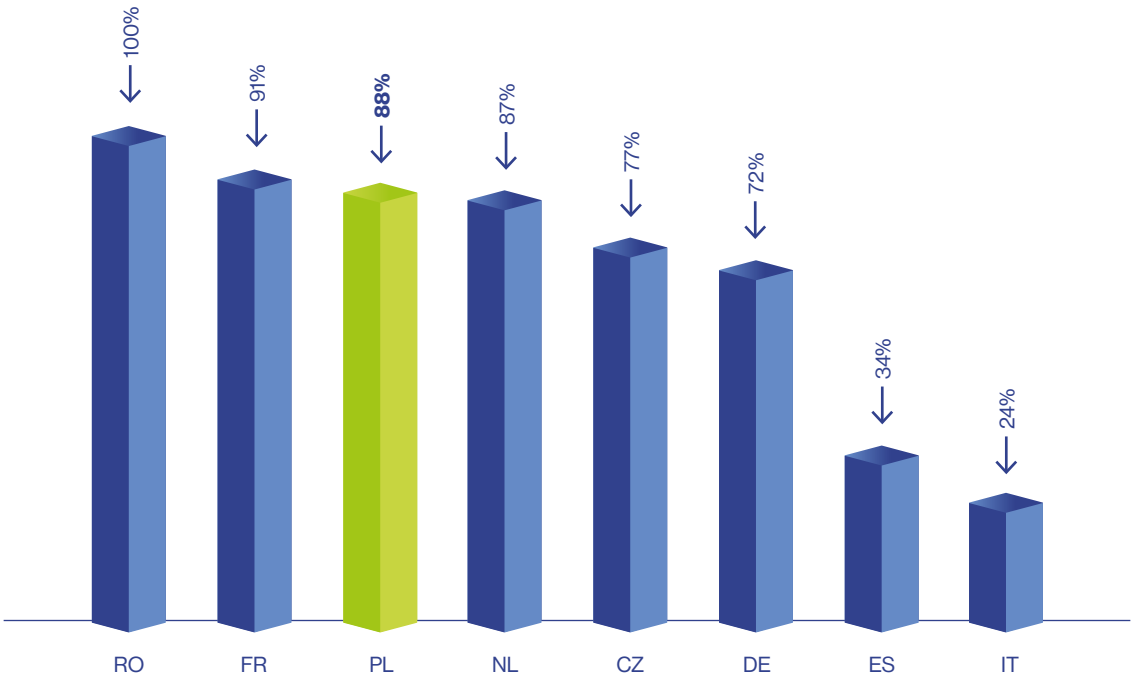


Source: databases maintained by UKE on the basis of reporting under Article 7 of the Telecommunications Act

3.4.4 | Comparison with European countries

According to data from the strategic consulting company Arthur D. Little included in the report "Pay TV Market in Poland"[32], in 2022 the penetration of paid TV services reached the highest level in Romania (100%), France (91%) and Poland (88%). Countries with high paid TV penetration (Romania, France, Poland) are characterised by competitive offers from operators, both in terms of the number of channels offered (including special packages, such as sports) and price. Low penetration is usually due to high subscription prices and/or limited offers (e.g. Italy, Spain).

Figure 95
Penetration of pay TV services in selected European Union countries



Source: UKE, based on the report "Pay TV Market in Poland," commissioned by the Polish Foundation for the Support of the Development of Electronic Communications PIKSEL, January 2023.

[32] Arthur D. Little Report "Pay TV Market in Poland," prepared for the Polish Foundation for the Support of the Development of Electronic Communications PIKSEL, January 2023.

4 Telecommunications market – infrastructure and network coverage

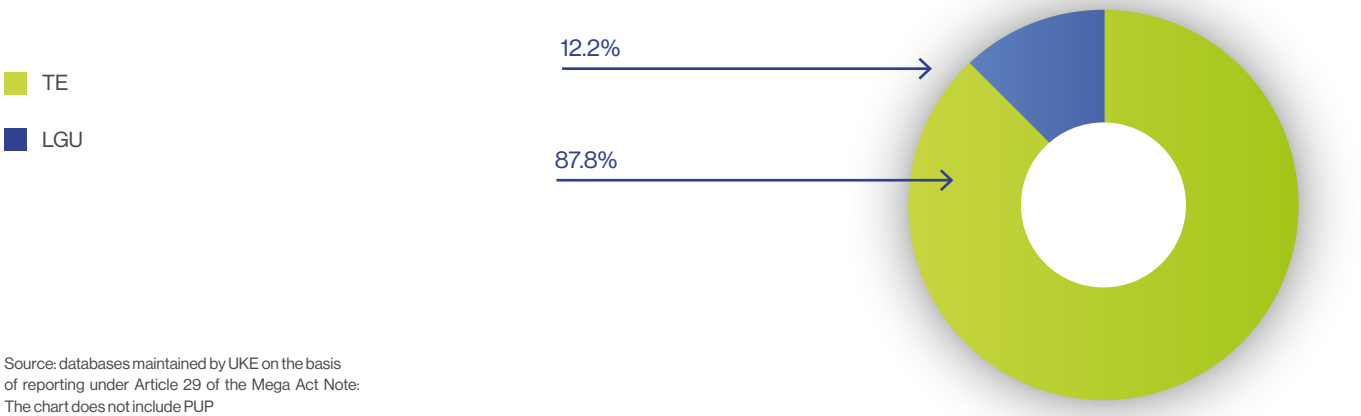
4.1 | Entities subject to information obligations under the inventory

The reporting obligation under Article 29 of the Mega Act for 2022 applied to 3,900 telecommunications entrepreneurs (TEs), 542 local government units (LGUs) enrolled in the RLGU and public utility providers (PUPs)[33].

The vast majority of entities required[34] to report on infrastructure and telecommunication services and buildings enabling co-location, were telecommunications entrepreneurs (87.8%), while 12.2% of this group were LGUs.

Figure 96

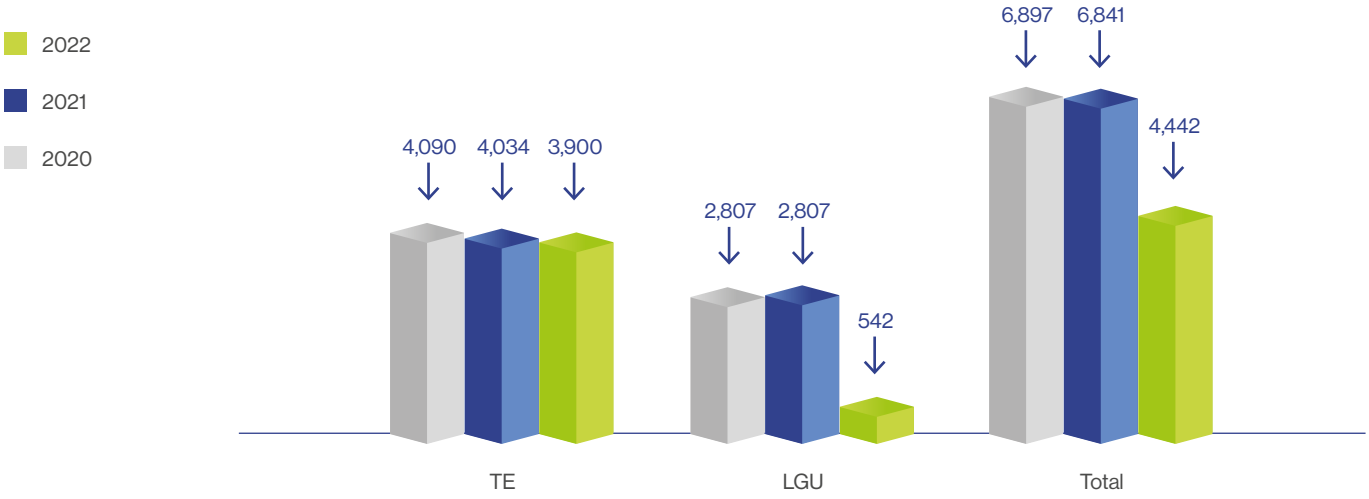
Percentage distribution of entities subject to reporting obligations under Article 29 of the Mega Act in 2022.



Source: databases maintained by UKE on the basis of reporting under Article 29 of the Mega Act Note: The chart does not include PUP

Figure 97

Number of entities required to submit data as part of the infrastructure and services inventory



Source: databases maintained by UKE on the basis of reporting under Article 29 of the Mega Act Note: The chart does not include PUP
This year's inventory of telecommunications infrastructure and services included 2963[35] fewer entities than last year. Such a significant difference in the number of entities is mainly due to the limitation of the group of local government units obliged to provide data only to entities enrolled in the RLGU.

[33] No register of PUPs is kept in Poland, so it is not possible to determine their number.
[34] The number of obligated entities does not include PUPs
[35] The number of entities includes PUP

It is worth noting that the differences in the number of entities subject to the inventory obligation were due, among other things, to a change in the legal state of affairs regarding the way in which information is to be provided – as of 2023, it is also possible for foreign telecommunications entrepreneurs registered in the RPT and based outside the territory of the Republic of Poland to provide data.

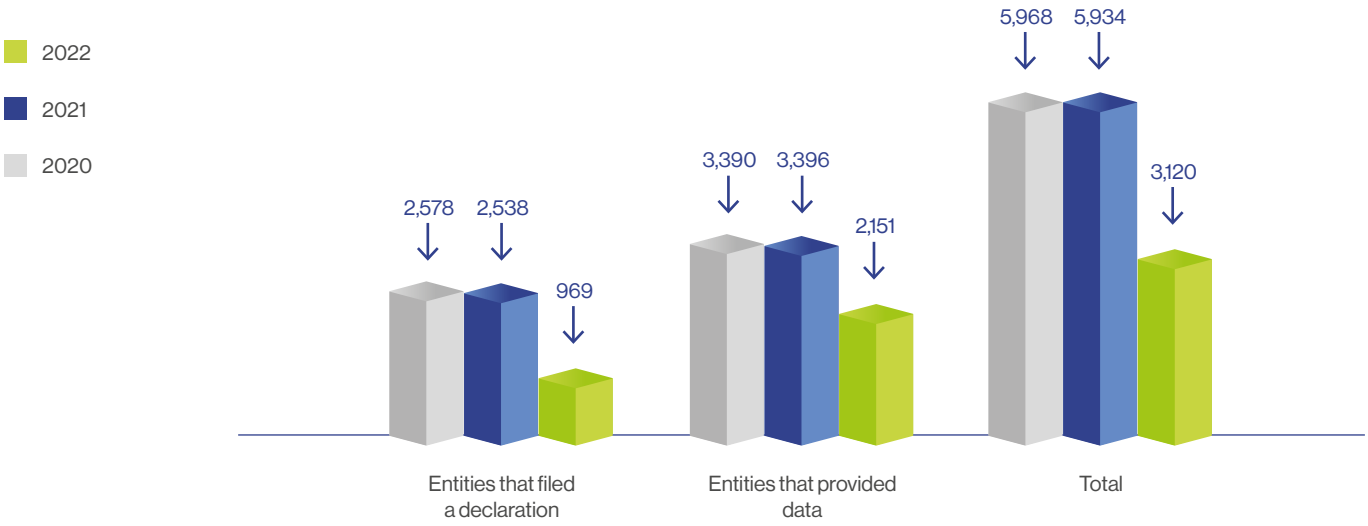
Data for 2022 was provided only by local government units enrolled in RLGU. In previous years, information in this regard was provided by all LGUs regardless of whether they had an entry in the RLGU. The above restriction resulted in a reduction in the number of LGUs required to provide information by 2265.

Entities that did not have telecommunications infrastructure, public telecommunications networks, buildings enabling co-location and did not provide telephone services, data transmission services providing broadband Internet access, and radio and television broadcast distribution services as of 31 December 2022, were required, pursuant to Article 29(2b) of the Mega Act, to make relevant declarations.

The reporting obligation for 2022 was fulfilled by 3120 entities, 47.4% less than for 2021, of which:

- data for 2022 on telecommunications infrastructure and services was provided by 2151 entities,
- statements on the lack of infrastructure and the failure to provide telecommunications services were submitted by 969 entities, including 938 telecommunications entrepreneurs.

Figure 98
The number of entities which submitted data and declarations as part of the inventory



4.2 | Zasięgi stacjonarnych sieci telekomunikacyjnych

Coverage and penetration of telecommunications networks were prepared based on actual and theoretical coverage from SIDUSIS.

► **Actual coverage36** [36] – the ability to provide retail data transmission service providing fixed broadband Internet access over fixed or mobile public telecommunications networks, which does not require the entity providing that service to make the investment related to obtaining additional approvals and permits other than those granted by the end user interested in using that service, and does not require the entity to verify the cost or complexity or time of carrying out the connection work to the end-user's location, other than that made at the time immediately preceding the connection work, or to carry out such work, the cost or complexity or time of which may be higher or longer than the average cost or complexity or time of connection work in the telecommunications market.

► **Theoretical coverage37** [37] – the ability to provide retail data transmission service providing fixed broadband Internet access over fixed or mobile public telecommunications networks, which does not require the entity providing that service to make the investment related to obtaining additional approvals and permits other than those granted by the end user interested in using that service, but requires the entity to verify the cost or complexity or time of the connection work to the end-user's location, other than that made at the time immediately preceding the connection work, or to carry out such work, the cost or complexity or time of which may be higher or longer than the average cost or complexity or time of connection work in the telecommunications market.

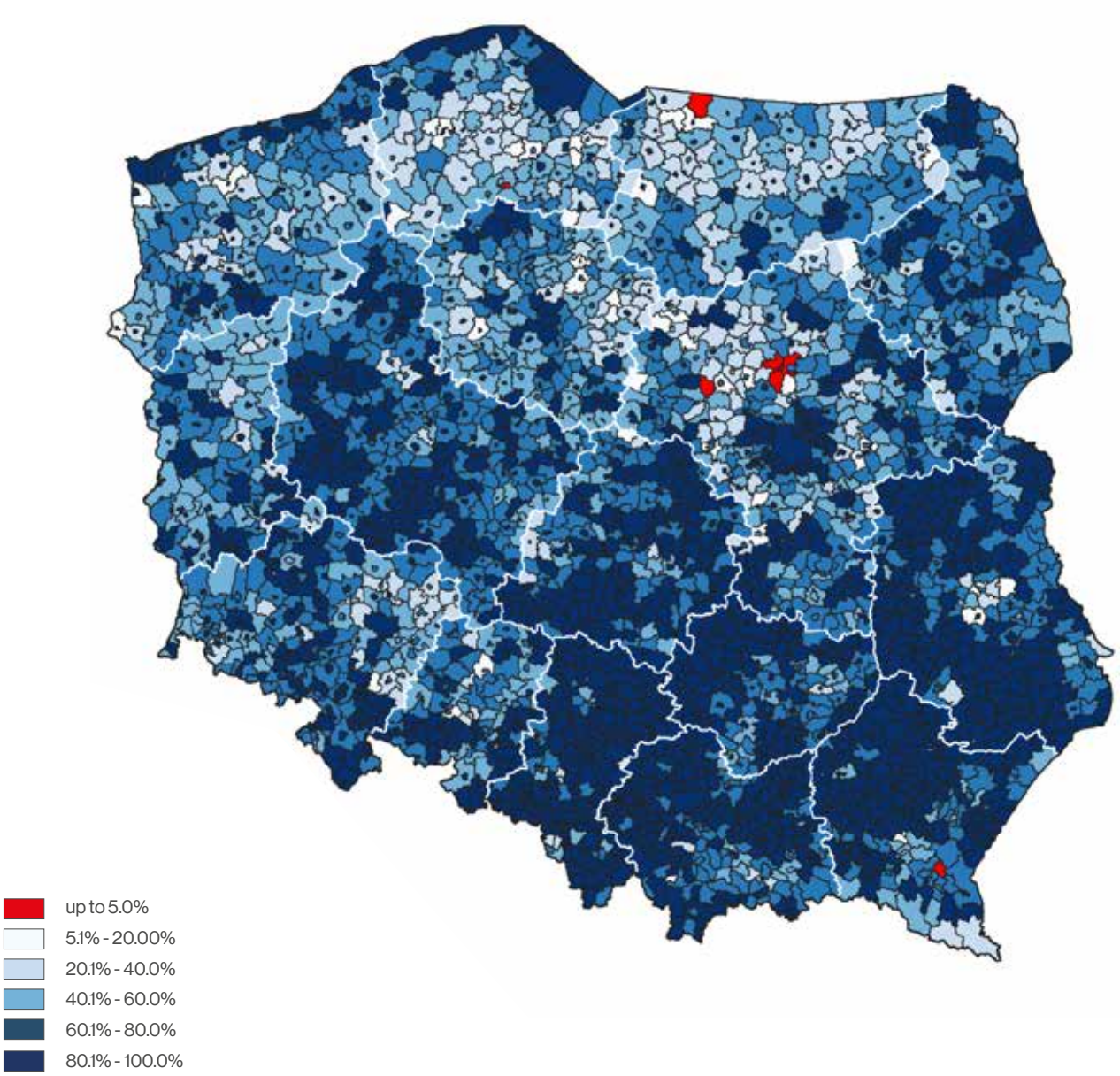
The building and premises penetration contains data on investments made within the framework of OPDP[38].

[36] Minister of Digital Affairs, "Technological Standards for the Information System on Access to Stationary Broadband Internet Services (SIDUSIS)," 2022.
[37] ibidem
[38] OPDP – The Operational Program Digital Poland (OPDP) aims to eliminate territorial disparities in access to high-speed Internet. Provides for the construction of a broadband network to address points that are white spots on the Internet access map (including designated educational institutions).

4.2.1 | Building penetration

The availability of public telecommunications networks is defined by the ratio of the number of buildings within range of a network with certain parameters to the number of all buildings in the analysed area, referred to as the building penetration rate. Buildings within the range of a network with specified parameters are deemed to be buildings with the capacity to provide the service as declared by the operator.
In 2022, invariably, the highest total penetration, reaching 100%, was achieved by municipalities located in the western and southern parts of the country and areas around large cities.

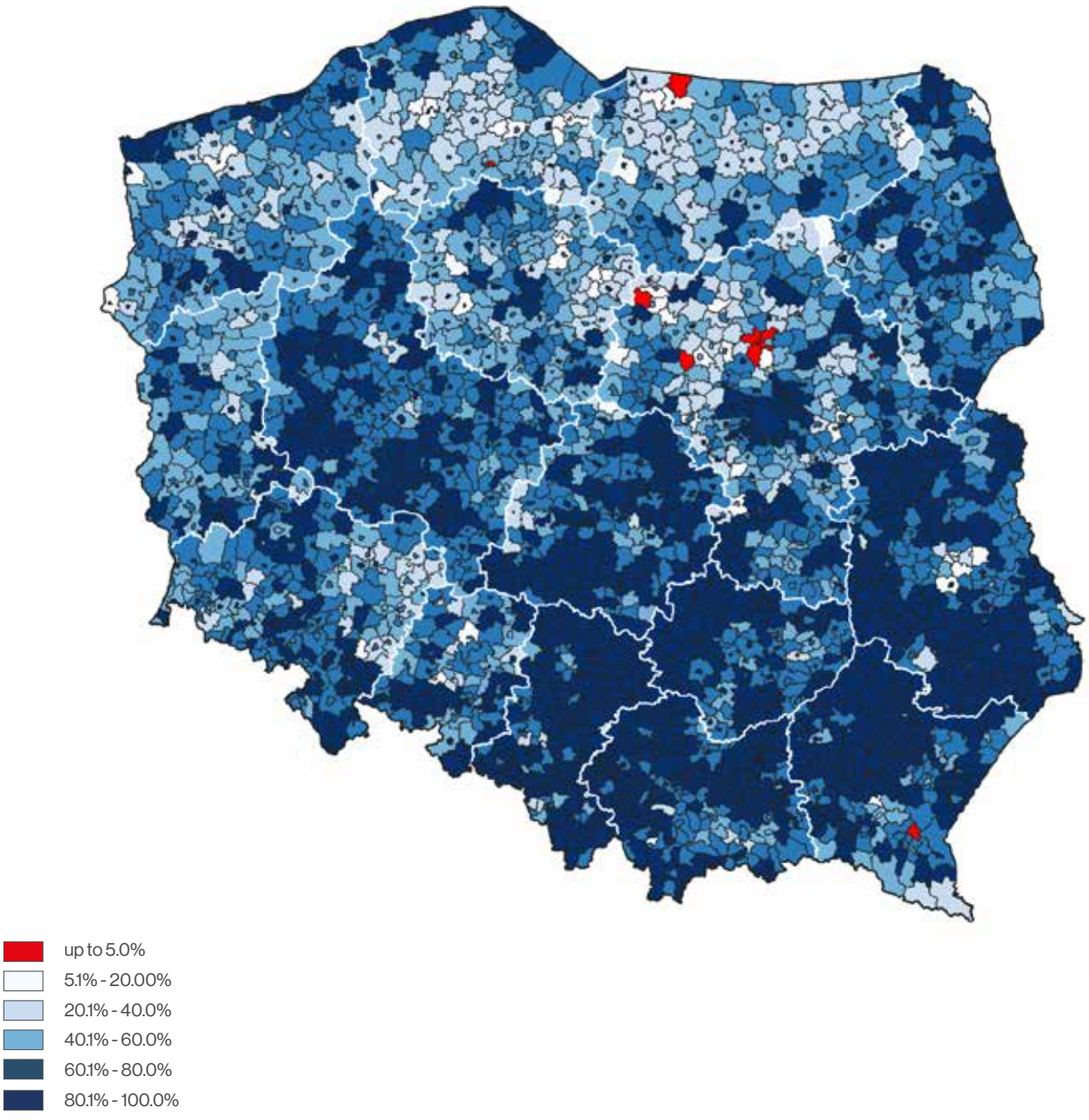
Map 1.
Total building penetration with fixed Internet coverages



Source: databases maintained by UKE on the basis of reporting under Article 29 of the Mega Act ("Megaustawa")

In 2022, the highest building Internet availability of at least 30 Mbps was noted in the Subcarpathian (94%), Silesian (89%) and Lesser Poland (85%) voivodeships and the lowest in Pomeranian (61%), Warmian-Masurian (63%) and Kuyavian-Pomeranian (68%). Most of the municipalities with building penetration of less than 5% are located in the northern part of the country.

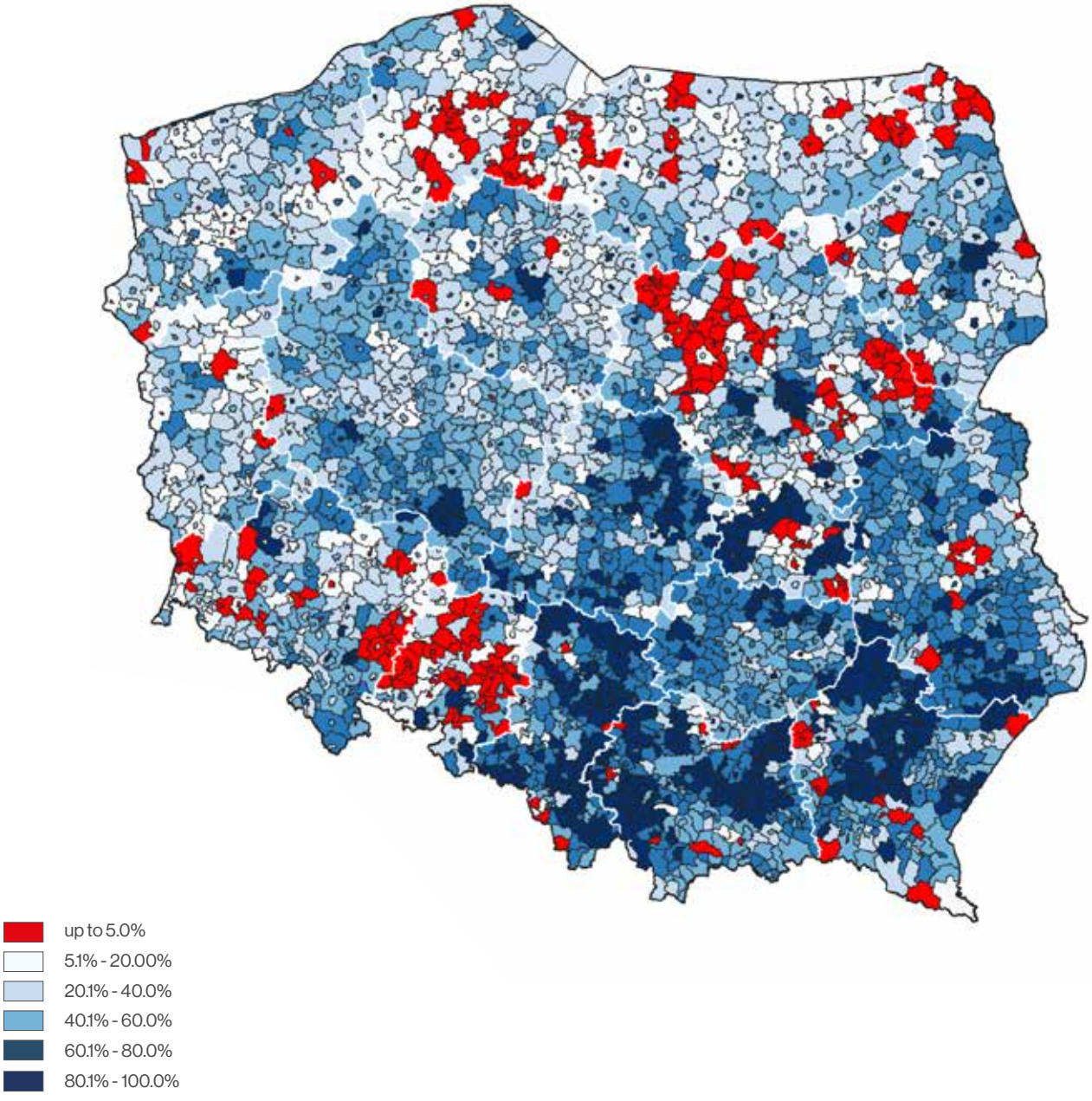
Map 2.
Building penetration with fixed Internet coverage of at least 30 Mbps capacity



Source: databases maintained by UKE on the basis of reporting under Article 29 of the Mega Act ("Megaustawa")

The share of SMEs in the total number of building coverage with a capacity of at least 30 Mbps was particularly high on the so-called „eastern wall" and in southern Poland. A relatively low share in the services provided was noticeable in the voivodeships with the largest urban centres in Poland.

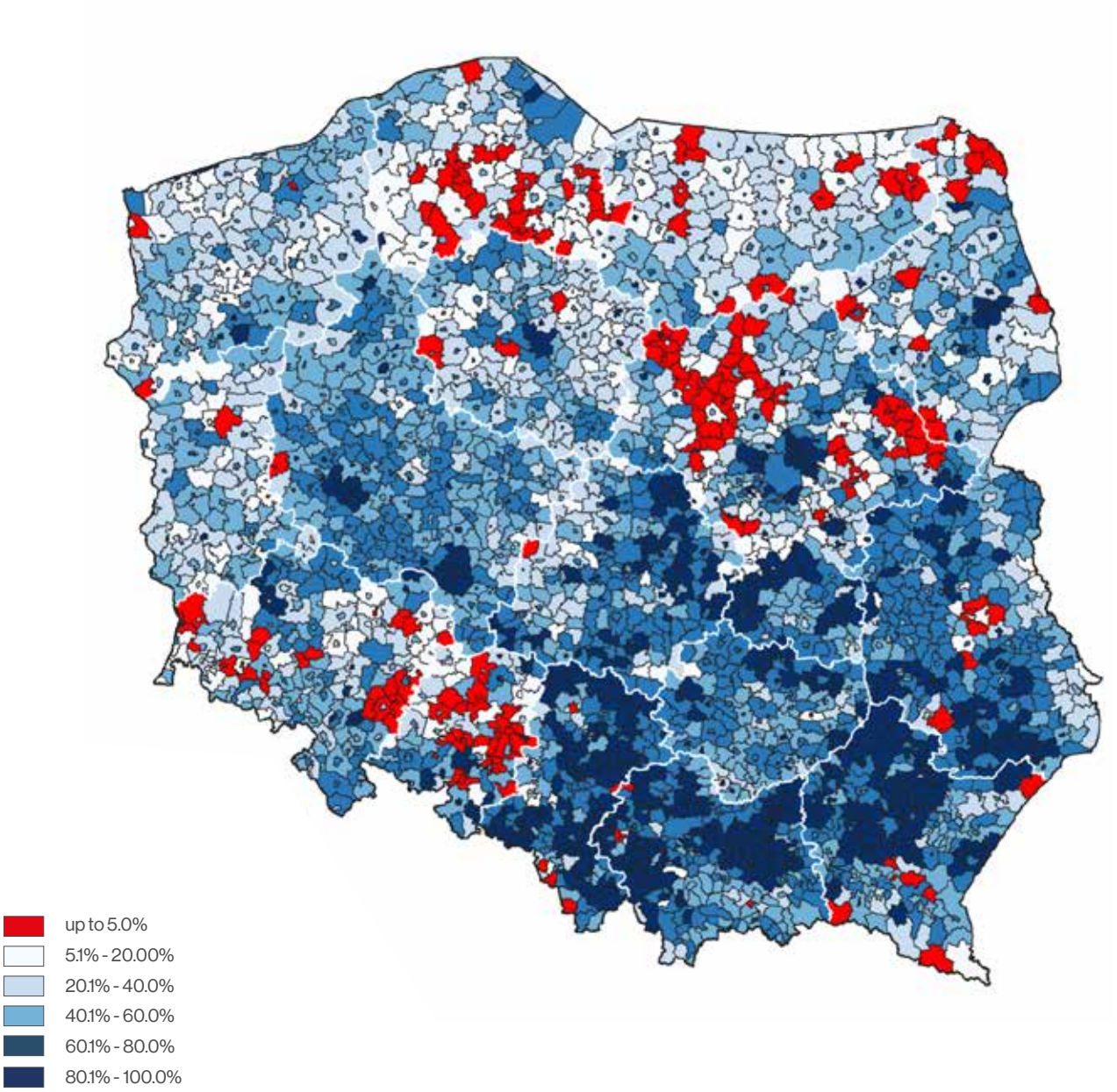
Map 3.
Share of SMEs in the total number of building penetration coverage with at least 30 Mbps



Source: databases maintained by UKE on the basis of reporting under Article 29 of the Mega Act ("Megaustawa")

The highest building availability of Internet of at least 100 Mbps was reported in the Subcarpathian (85%), Silesian (78%) and Lesser Poland (75%) voivodeships, and the lowest in Pomeranian (40%), Warmian-Masurian (43%) and West Pomeranian (46%). Large differences in the availability of a service with given parameters were seen in the Masovian region, where the building penetration rate for the entire voivodeship was 56%, while in its northern and southern parts clusters of municipalities with a rate of no more than 5% were visible. In municipalities centred around Warsaw, penetration approaches 100%.

Map 4.
Building penetration with fixed Internet coverage of at least 100 Mbps capacity

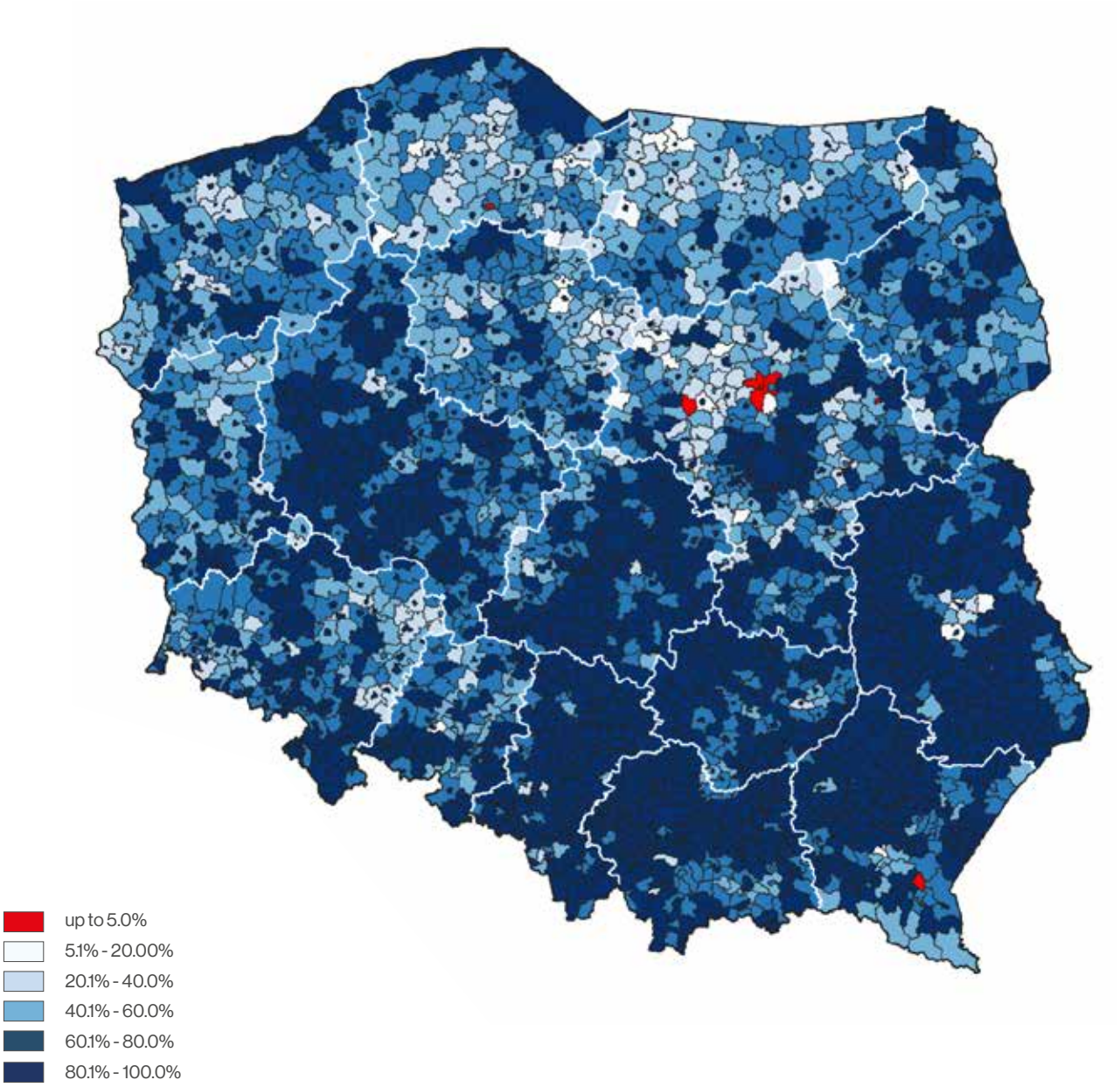


Source: databases maintained by UKE on the basis of reporting under Article 29 of the Mega Act ("Megaustawa")

4.2.2 | Premises penetration

The highest premises availability of 30 Mbps Internet was reported in the Subcarpathian (97%), Silesian (95%) and Łódzkie (93%), and the lowest in Warmian-Masurian (83%), Pomeranian (84%) and Kuyavian-Pomeranian (85%) voivodeships. Most of the municipalities with building penetration of less than 20% were located in the northern and north-eastern parts of the country.

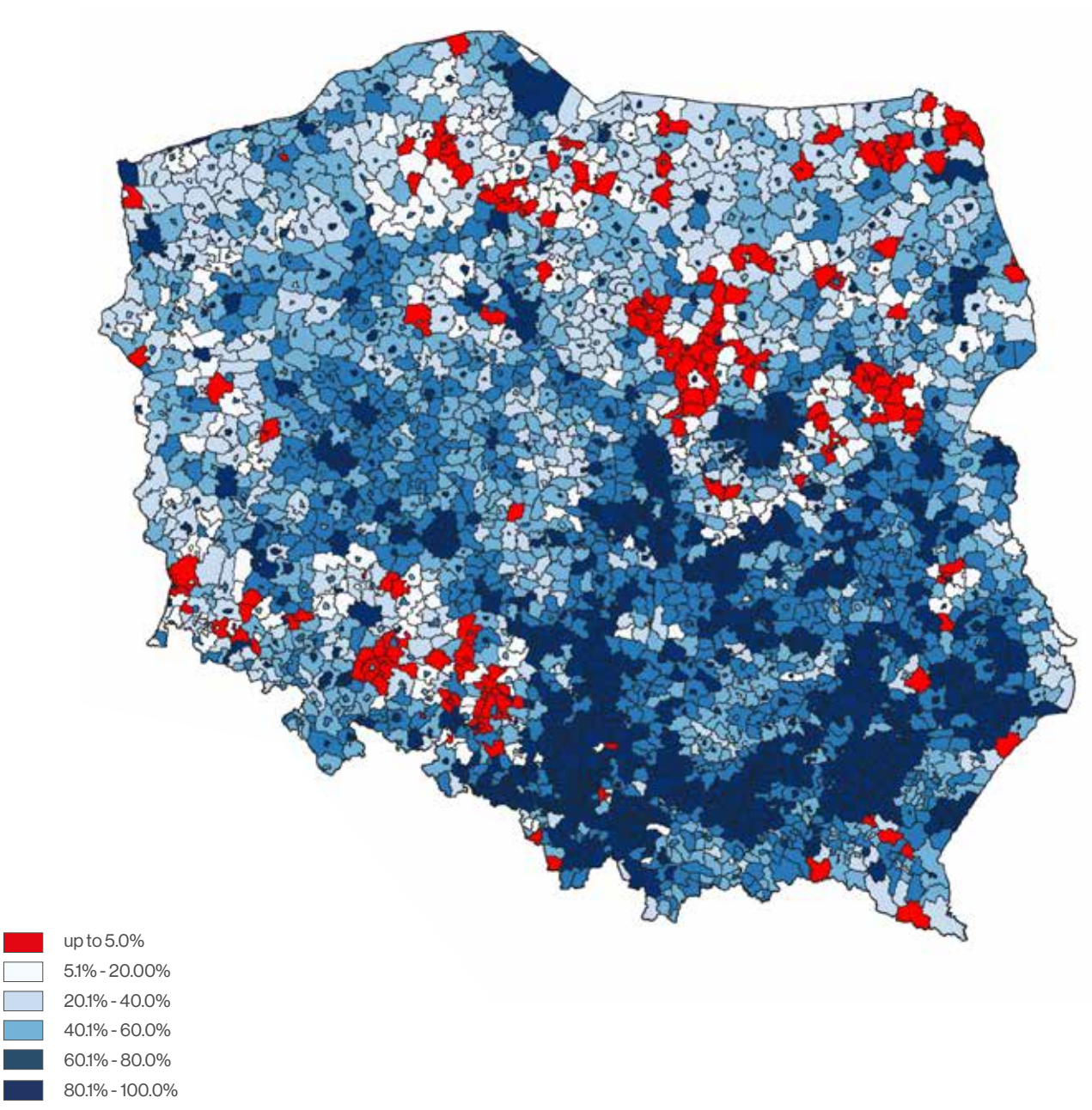
Map 5.
Premises penetration of fixed Internet coverage of at least 30 Mbps



Source: databases maintained by UKE on the basis of reporting under Article 29 of the Mega Act ("Megaustawa")

The highest on-premises availability of Internet of at least 100 Mbps was seen in the Subcarpathian (89%), Silesian (87%) and Lesser Poland (84%) voivodeships, and the lowest in Opolskie (63%), Lubuskie (65%) and Warmian--Masurian (70%) voivodeships. Most municipalities with building penetration of less than 20% were located in the northern and north-eastern parts of the country

Map 6.
Premises penetration of fixed Internet coverage of at least 100 Mbps



Source: databases maintained by UKE on the basis of reporting under Article 29 of the Mega Act ("Megaustawa")

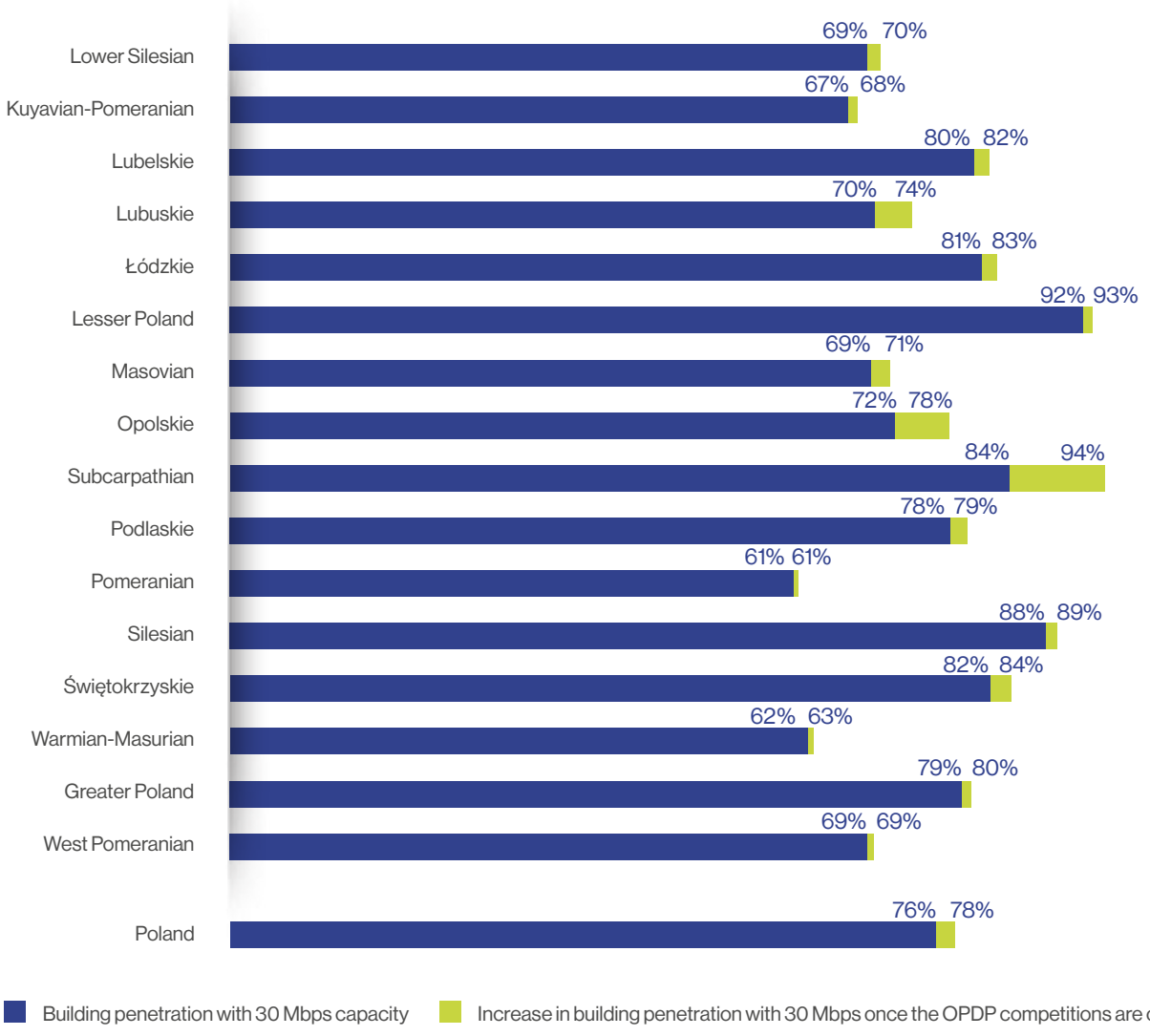
4.2.3 | OPDP

The Operational Program Digital Poland (OPDP) aims to eliminate territorial disparities in access to high-speed internet. As part of OPDP's Priority Axis I, a telecommunications infrastructure is being built to achieve bandwidths of at least 30Mbps.
In 2016–2020, the areas covered by European Union funding covering the entire territory of Poland were announced in a competitive mode. The beneficiaries from these areas are to connect more than 11,000 public facilities, including schools, community centres and fire stations, as well as 2 million address points. Most of the beneficiaries have chosen fiber-optic technology for their projects.

Currently, competition 1 has been completed, 2 and 3 are at the final stages, and competition 4 is underway. Completion of all areas will enable building penetration of fixed Internet coverage of at least 30 Mbps at 78%. The increase of 12 percentage points in this value compared to 2021 is due to the implementation of the additional coverage obligation resulting from delays in the implementation of OPDP projects. The delay affects nearly half of the ongoing projects.

The highest increase in building penetration value with a bandwidth of at least 30 Mbps after OPDP competitions are completed will be achieved in Opolskie, Subcarpathian and Lubuskie voivodeships.

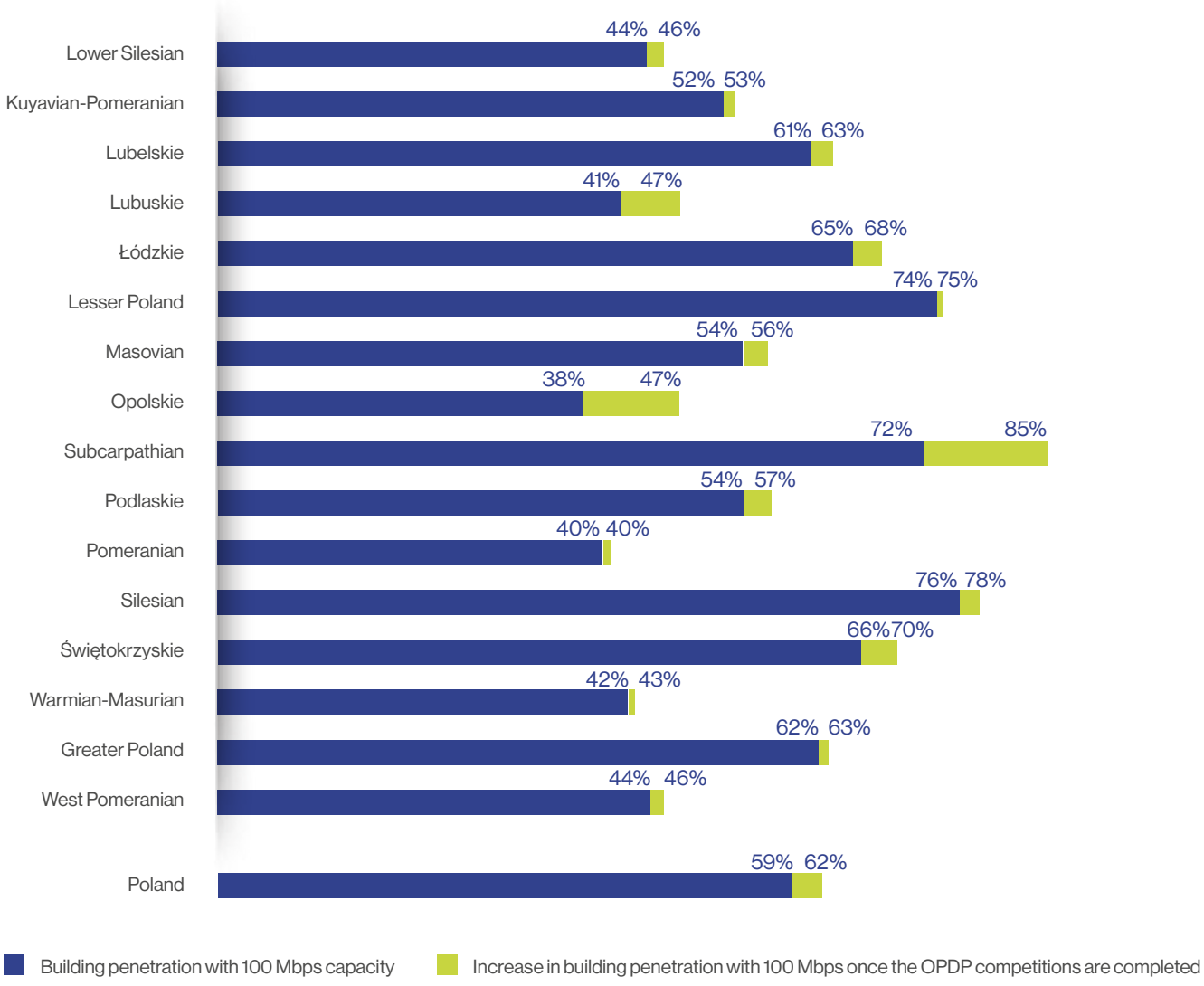
Figure 99
Building penetration with fixed-line internet coverages with at least 30 Mbps capacity once OPDP investments are completed



Source: databases maintained by UKE on the basis of reporting under Article 29 of the Mega Act ("Megaustawa")

The highest increase in building penetration value of min. 100 Mbps coverage after OPDP competitions are completed will be achieved in Subcarpathian, Opolskie and Lubuskie voivodeships.

Figure 100
Building penetration with fixed Internet coverages with at least 100 Mbps capacity once OPDP investments are completed



Source: databases maintained by UKE on the basis of reporting under Article 29 of the Mega Act ("Megaustawa")

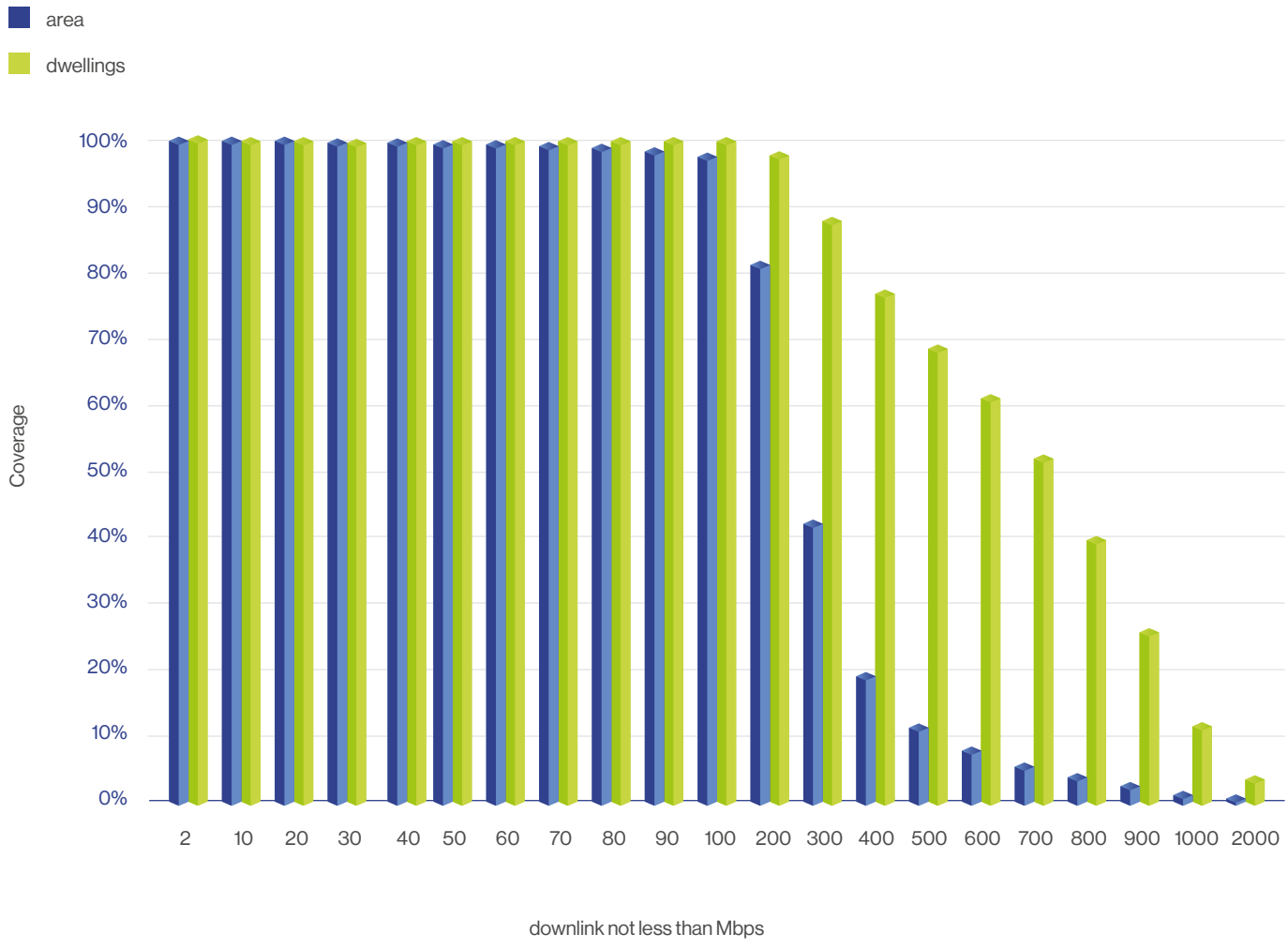
4.3 | Mobile networks

4.3.1 | Mobile Internet - speed

The primary indicator of mobile Internet quality is the speed to the user[39] reported by mobile network operators in a regular grid of squares with a field of 1 hectare.

Virtually the entire area of the country was covered by mobile Internet with a maximum speed of at least 100 Mbps at the end of 2022. More than 60% of dwellings were within the range of maximum speeds above 600 Mbps although this area covered only 5% of the country.

Figure 101
Range of maximum broadband speed in the direction to the user (downlink)



Source: databases maintained by UKE on the basis of reporting under Article 29 of the Mega Act ("Megaustawa"), number of housing units - CSO

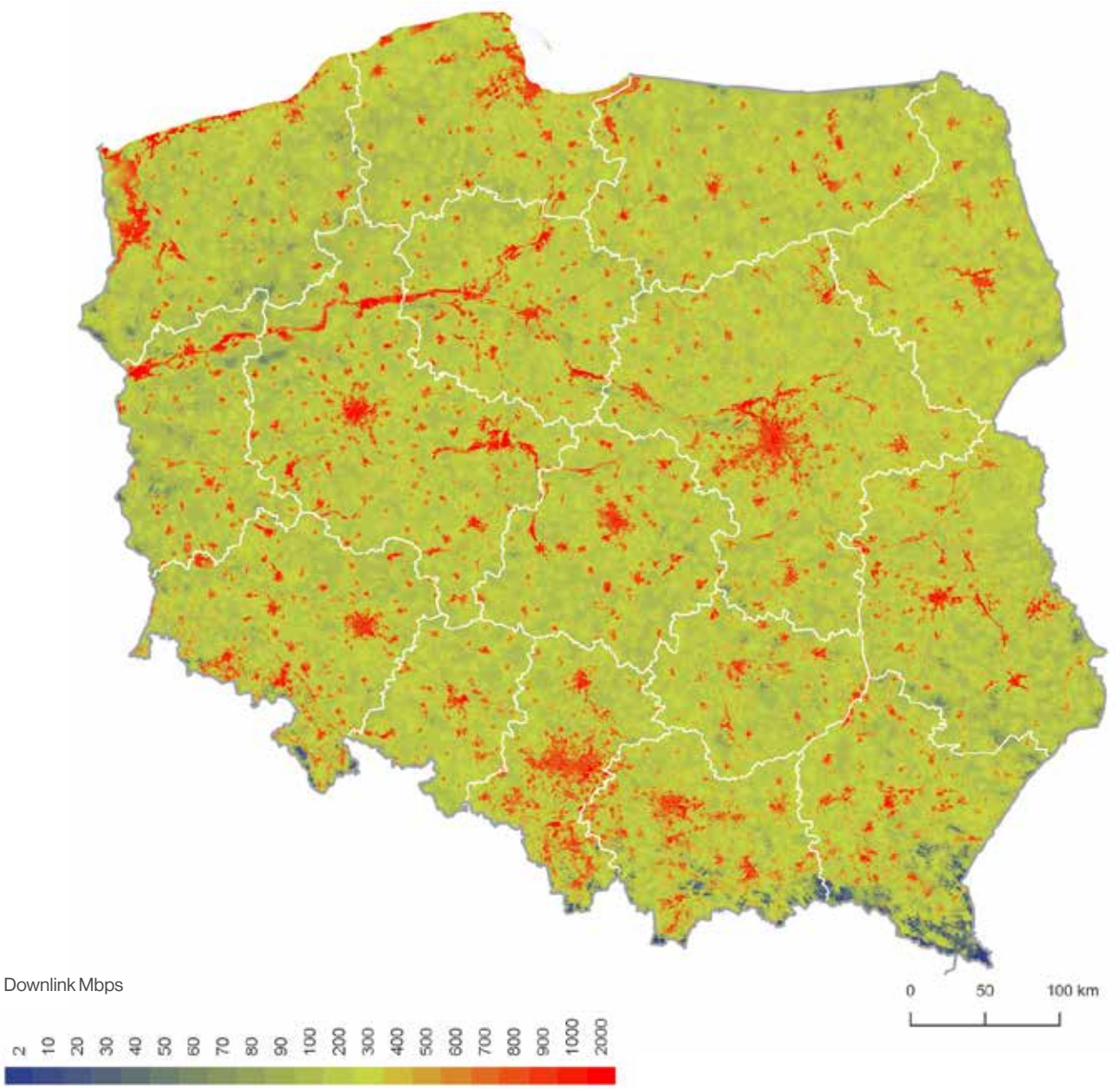
[39] The maximum speed to a user in a defined reference grid field is the sum of the bandwidth that can be offered, outdoor from all base stations to the downlink, taking into account all the operator's frequency resources and technologies used. Maximum speed to the user is a measure of the performance of mobile broadband public telecommunications networks. This is the highest speed the operator can

Areas of inferior performance are limited to non-urbanised areas, especially mountain areas, including Bieszczady and Magura National Park, as well as large forest complexes, e.g. Drawa National Park, Solska Forest, Notecka Forest.

High speeds are available primarily in highly urbanised areas with dense networks of base stations and open areas with favourable topography, such as inland bodies of water.

The highest mobile internet speeds primarily covered the eight largest metropolitan areas, but also included medium-sized cities, as well as most county towns.

Map 7.
Range of maximum broadband speed in the direction to the user



Source: databases maintained by UKE on the basis of reporting under Article 29 of the Mega Act ("Megaustawa")

4.3.2 | Network coverage in the radio bands

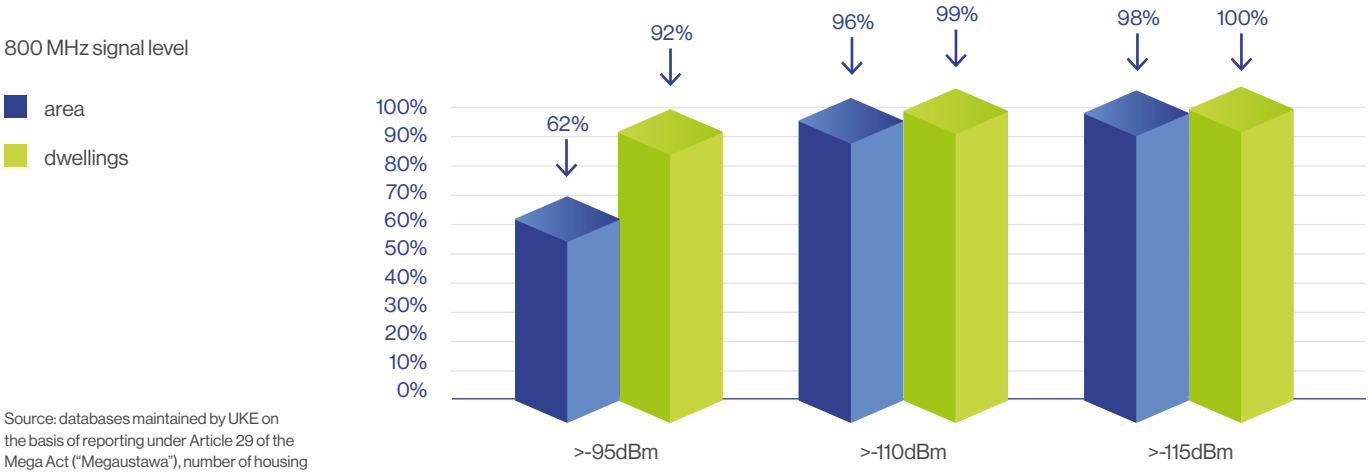
Mobile public telecommunications network services until the end of 2022 were provided on the basis of the 800, 900, 1800, 2100 and 2600 MHz radio bands used by operators. As part of the mobile network infrastructure inventory, the following coverage classes defining signal strength were adopted under standard outdoor measurement conditions, at a level of 1.5 m above the ground:

- above -95dBm – very good,
- -95 to -110dBm – good,
- -110 to -115dBm – sufficient.

Signal levels below -115 dBm are considered insufficient for stable transmission using standard consumer equipment.

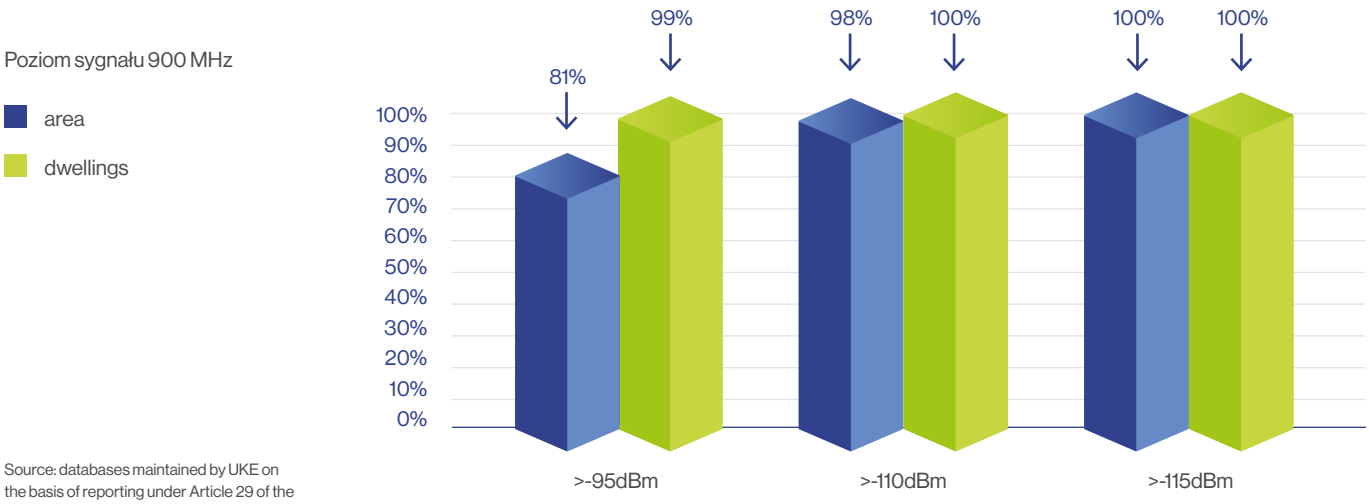
The 800 and 900 MHz bands provide coverage of virtually the entire area of Poland with mobile network access. 2% of the country's area outside coverage in the 800 MHz band includes a strip of land about 10 km wide along the border with Russia and Ukraine. This is due to the agreements made with these countries on the use of these frequencies.

Figure 102
Coverage of mobile networks in the 800 MHz band



Source: databases maintained by UKE on the basis of reporting under Article 29 of the Mega Act ("Megaustawa"), number of housing units - CSO

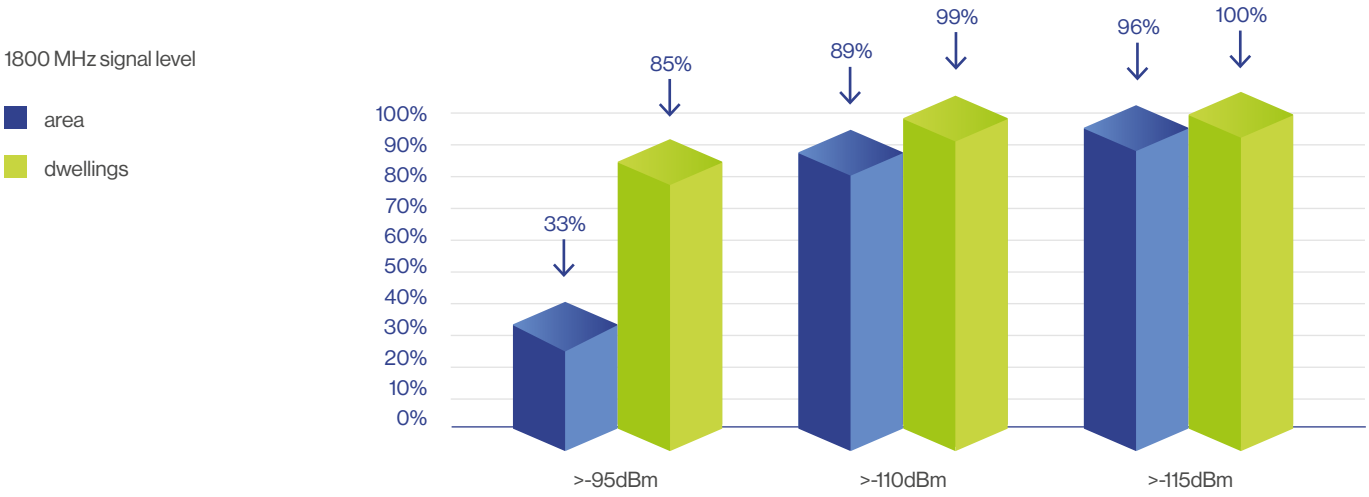
Figure 103
Coverage of mobile networks in the 900 MHz band



Source: databases maintained by UKE on the basis of reporting under Article 29 of the Mega Act ("Megaustawa"), number of housing units - CSO

The 1800 MHz band allows for increased network capacity primarily in urban areas. Given the propagation properties of frequencies above 1 GHz, these resources are less used in rural areas (mainly due to the high cost of network construction), with larger forest complexes out of reach.

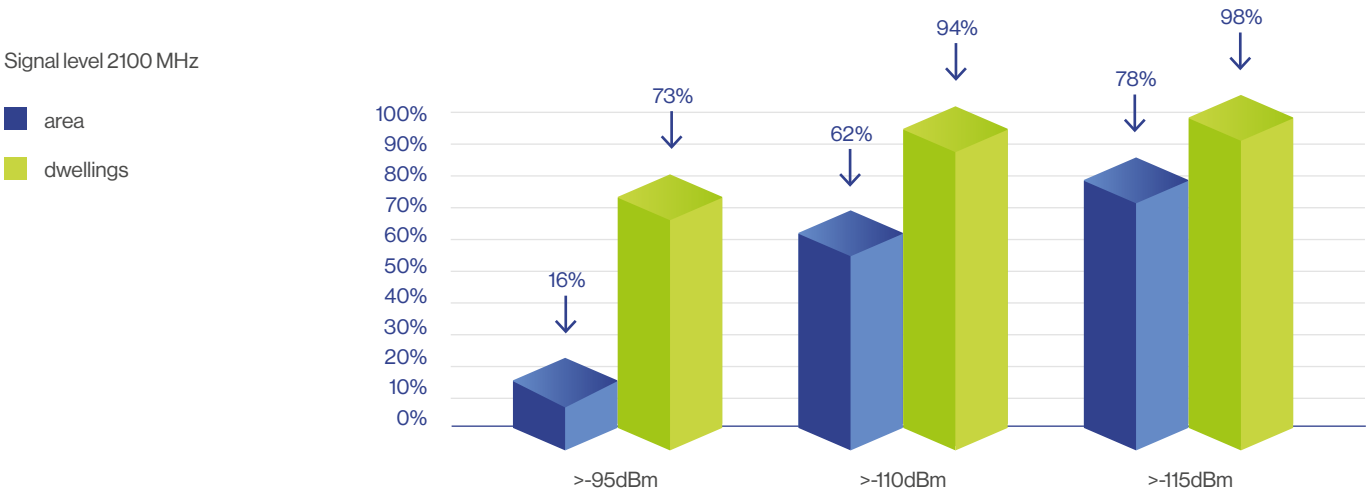
Figure 104
Coverage of mobile networks in the 1800 MHz band



Source: databases maintained by UKE on the basis of reporting under Article 29 of the Mega Act ("Megaustawa"), number of housing units - CSO

The 2100 and 2600MHz bands are used to build high-capacity and high-bandwidth networks, including transmission of 5G standard. Area coverage is already more selective, limited to urban areas.

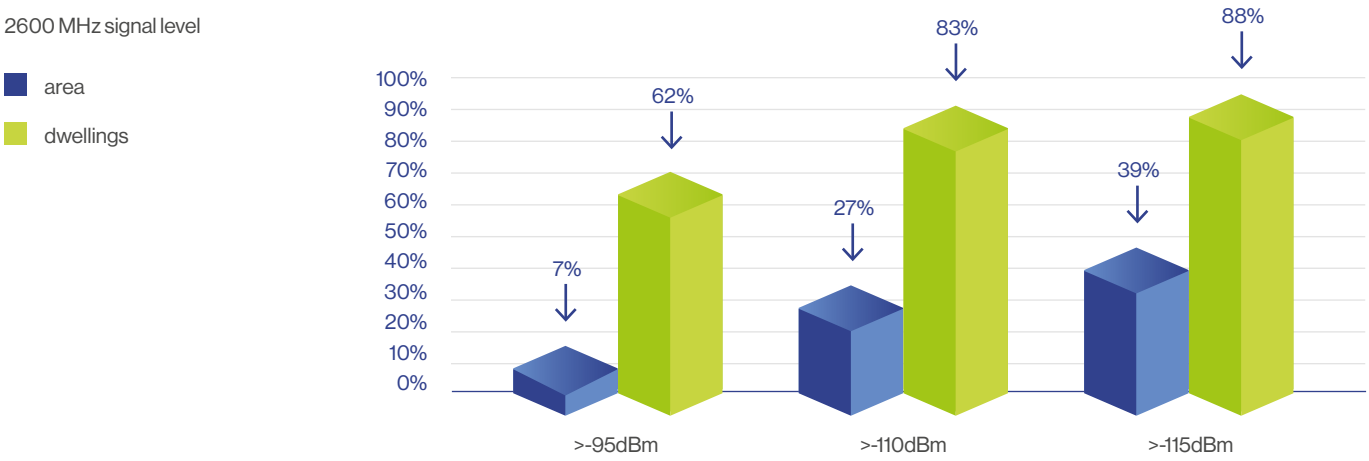
Figure 105
Coverage of mobile networks in the 2100 MHz band



Source: databases maintained by UKE on the basis of reporting under Article 29 of the Mega Act ("Megaustawa"), number of housing units - CSO

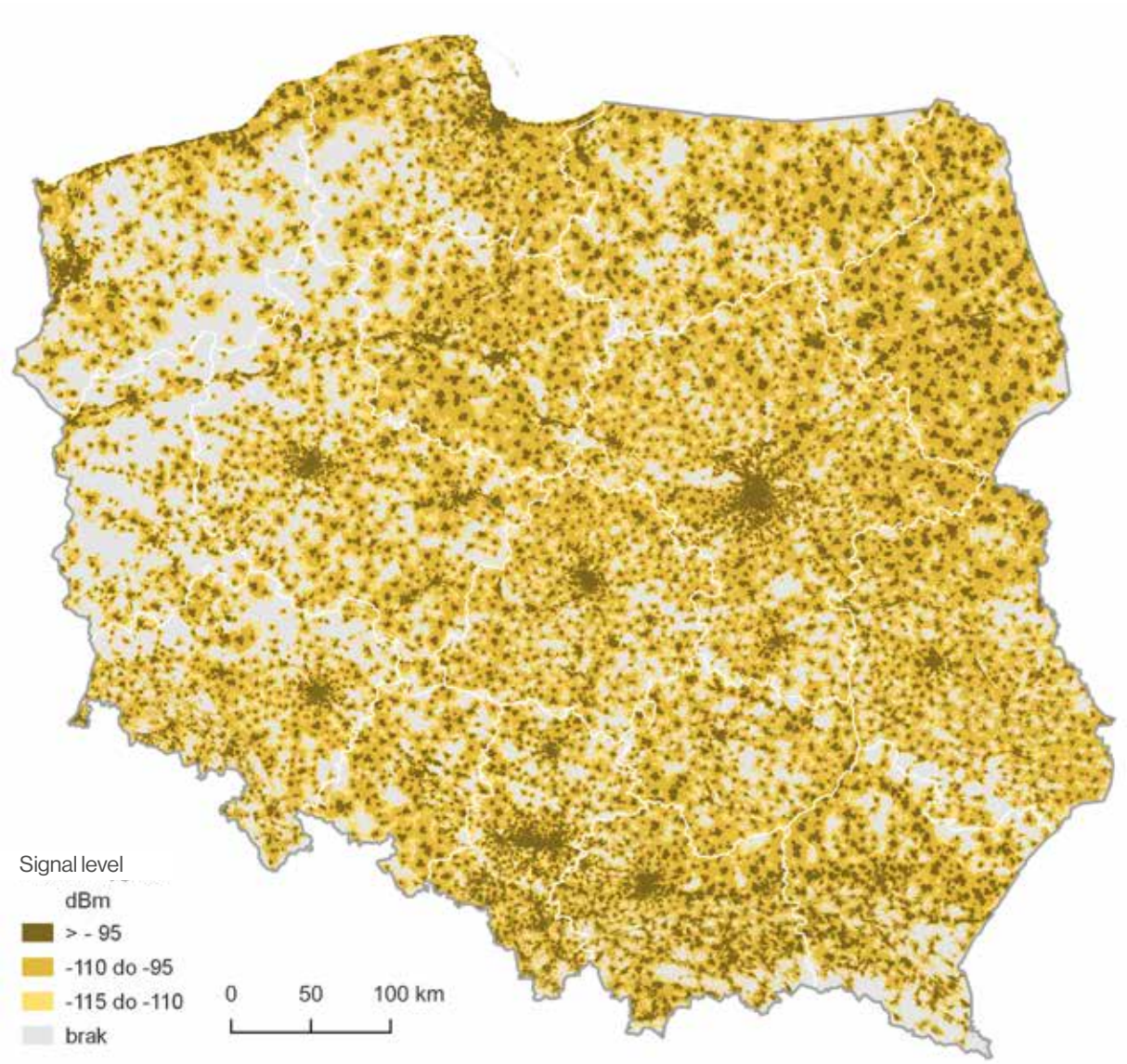
As a result, despite limited coverage, 88% of homes are covered sufficiently, and 62% of homes very good network coverage to access high-speed mobile Internet.

Figure 106
Coverage of mobile networks in the 2600 MHz band



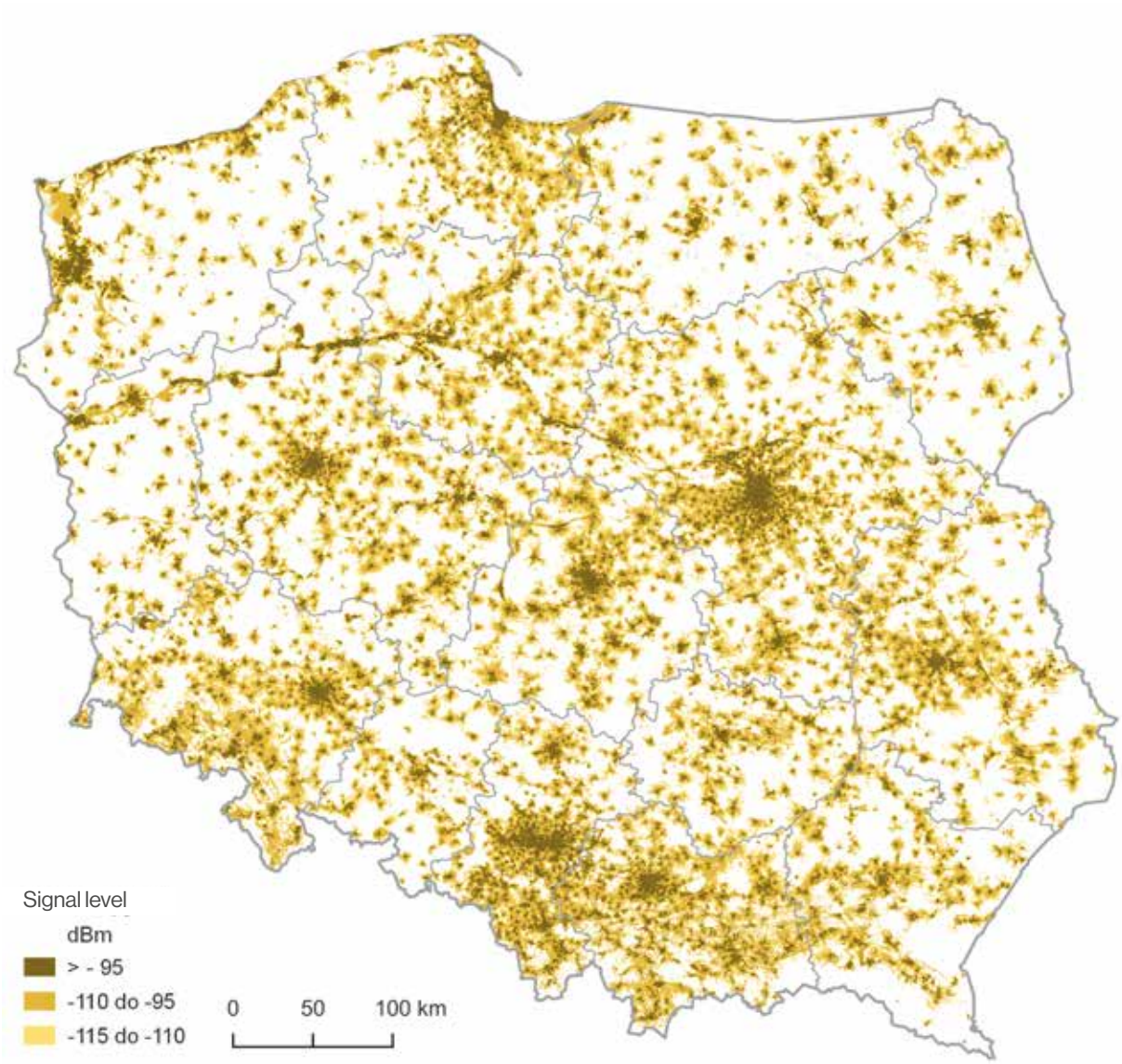
Source: databases maintained by UKE on the basis of reporting under Article 29 of the Mega Act ("Megaustawa"), number of housing units - CSO

Map 8.
Coverage of mobile networks in the 2100MHz band



Source: databases maintained by UKE on the basis of reporting under Article 29 of the Mega Act ("Megaustawa"), number of housing units - CSO

Map 9.
Degree of coverage of mobile networks in the 2600MHz band



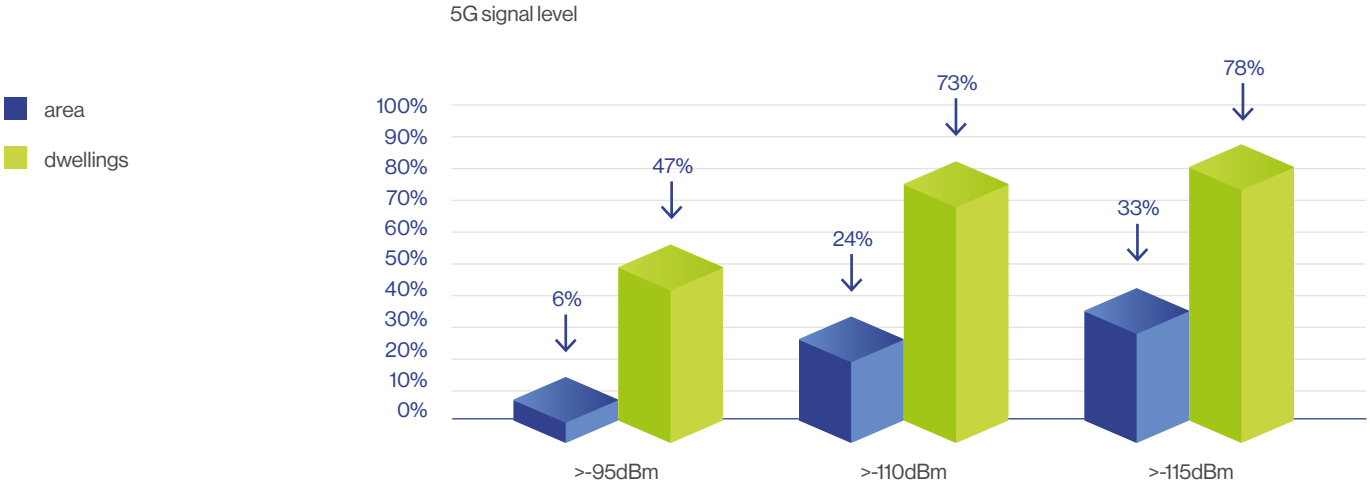
Source: databases maintained by UKE on the basis of reporting under Article 29 of the Mega Act ("Megaustawa"), number of housing units - CSO

4.3.3 | 5G technology coverage

By the end of 2022, mobile network operators in Poland will have deployed 5G NSA (Non-Standalone) technology using frequency resources from the 2100 MHz and 2600 MHz bands. Further development of 5G mobile technology will be possible by making even higher frequencies available to operators in the 3.6 GHz (3.4-3.8 GHz) and 26 GHz bands (24.25-27.5 GHz), as well as the use of 5G technology in SA (standalone) architecture.

5G technology in the NSA architecture is already widely deployed in shared radio bands above 2 GHz. It covers 1/3 of the country's territory and 3/4 of its dwellings.

Figure 107
Coverage rate of mobile networks with 5G technology

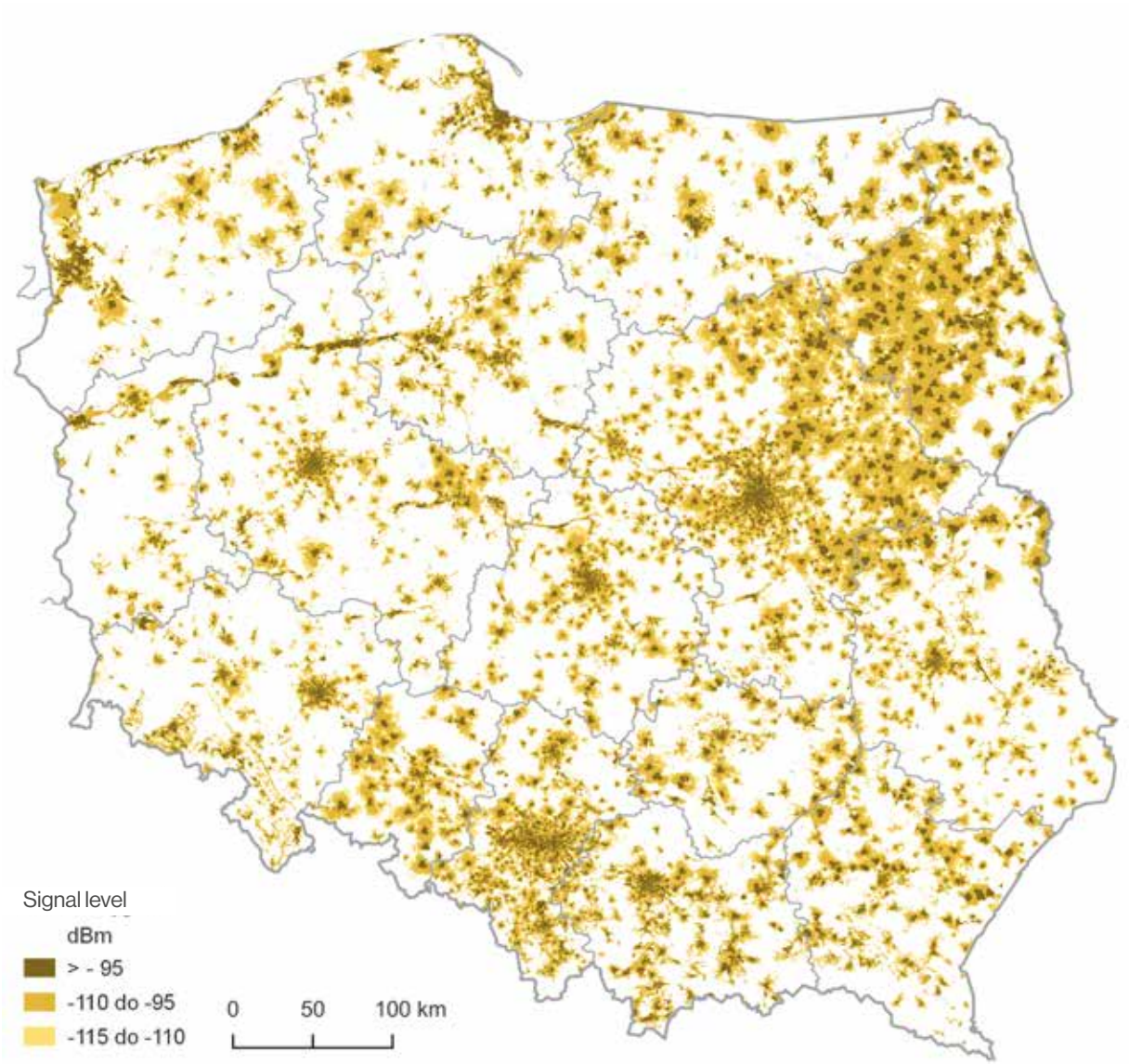


Source: databases maintained by UKE on the basis of reporting under Article 29 of the Mega Act ("Megaustawa")

The highest level of 5G mobile network availability was declared by operators in the area of the eight largest metropolitan areas, as well as larger cities in Poland. Outside access to this technology remains smaller centres and rural areas. The exception is Podlasie and the eastern part of Masovia, where 5G coverage is much better. Thanks to a dense network of stations working in the 2100 MHz band, located not only in cities, but also in larger towns, coverage of most of the cited area is achieved.

It is worth noting that the degree of urbanization and population density in this part of Poland are lower than average, so building a comparable network structure in the rest of the country should be no less effective.

Map 10.
Coverage rate of mobile networks with 5G technology



Źródło: bazy danych prowadzone przez UKE na podstawie sprawozdawczości z art. 29 Megaustawy

5 Wholesale service providers

To meet the expectations of entrepreneurs, for whom wholesale operations are the primary type of activity in the telecommunications market, the President of UKE presents basic information in this regard obtained from market sources.

5.1 | General Information

The data presented in this chapter comes from four[40] telecommunications companies for which wholesale operations are the primary type of telecommunications business. While the report presents data from the largest wholesale players, it is important to keep in mind that smaller, SME-based service providers are also very effective in such a model.[41]

One of the significant changes in the telecommunications market in Poland over the past few years is the emergence of a wholesale market. The impetus for launching the operator model wholesale access network on a large scale were funds for the construction of fiber optic networks, available within the framework of OPDP.

Thanks to subsidies and the involvement of private investors' own funds, as of 2017, networks reaching millions of households have been established in Poland made available, according to the OPDP programme, in a wholesale model. Further growth in the wholesale market will be associated with the construction of fiber optic access networks (FTTH[42]) and fiber optic backhaul[43] to telecommunications towers supporting the 5G standard.[44] These investments will be made with the operators' own funds and under new NIP[45] and FERC programmes[46].

According to the operational programmes, wholesale operators provide the broadest possible wholesale access to their networks on open, equal and non-discriminatory terms to all telecommunications companies interested in using their networks. When offering wholesale access services to affiliated retail service providers, the terms and conditions of cooperation for other operators must not be inferior to those applied by the wholesale operator within its own enterprise or in its relations with subsidiaries.

The business of wholesale operators is based on the assumption of efficient use of infrastructure through cost optimisation, which is due to the possibility of using the built fiber optic cable by a large number of beneficiary entrepreneurs. The basis of the wholesale operator model is the equal and non-discriminatory treatment of each benefiting operator. This means that the same information, the process and service are available to any retail service provider to the same extent, at the same time and under the same conditions.
In particular, each benefiting entrepreneur is subject to the same service prices regardless of the scale of fiber optic use.

Not only do all the nationwide wholesale operators work with the largest operators in Poland, but also many local and regional retail fixed-line Internet access service providers.

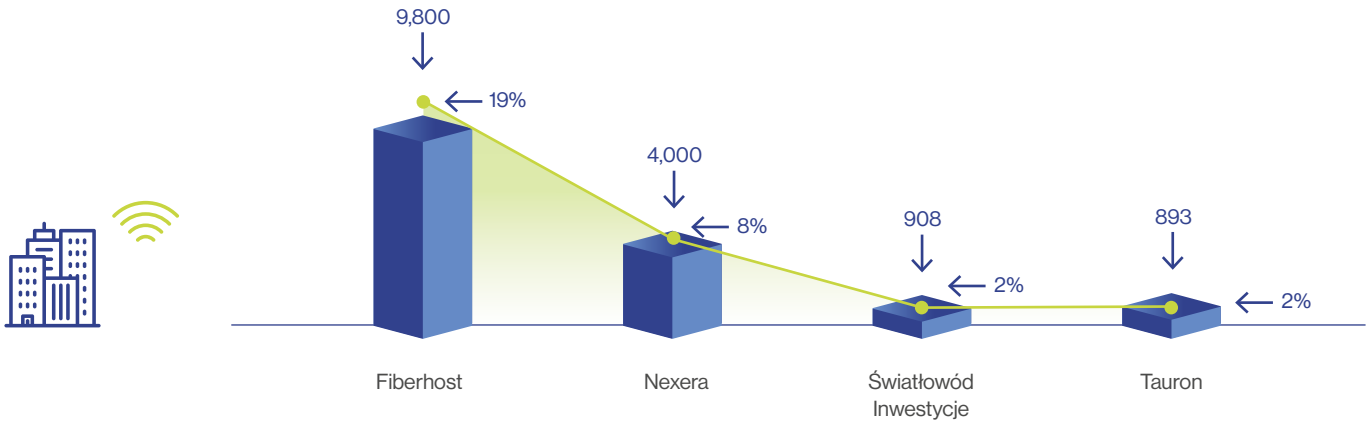
[40] Fiberhost S.A., NEXERA Sp. z o.o., Światłowód Inwestycje Sp. z o.o., Polski Światłowód Otwarty Sp. z o.o. (Polski Światłowód Otwarty is a new entity and does not have network coverage data for 2020-2022, TAURON Obsługa Klienta sp. z o.o.
[41] Marek Jaślan, Hurtowe emocje w środowisku lokalnych ISP [Wholesale excitement among local ISPs], TELKO.in, 2023.
[42] FTTH (Fiber To The Home) – a variation of FTTX (broadband telecommunications access whose medium is fiber optic cables) designed for the home user, where fiber is routed from the exchange to the subscriber's apartment/location. FTTH is considered networks in which fiber optic cable is brought to every premise in the building.
[43] Dedicated fiber optic links.
[44] Marek Jaślan, Światłowód będzie napędzał cały rynek hurtu telekomunikacyjnego w Polsce [Fiber optics will drive the entire telecommunications wholesale market in Poland], TELKO.in, 2023.
[45] The National Plan for Reconstruction and Resilience Enhancement (KPO) is a development plan outlining the goals for rebuilding and building Poland's socio-economic resilience after the crisis caused by the COVID-19 pandemic, as well as the reforms and investments to implement them.
[46] European Funding for Digital in the 2021-2027 – EU grants for digital transformation of the economy and society.

5.2 | Coverage of fiber optic wholesale networks

Wholesale operators provide access both to networks that have already been used to provide services to end-users, as well as to newly built networks, including with public funds. Funding for the construction of the network makes it possible to reach an increasing number of end users in localities that lacked broadband access with modern infrastructure.

Analysing the status at the end of 2022, it can be concluded that the networks of Fiberhost, Nexera and Tauron do not overlap. Only the networks of Fiber Optic Investment overlap partially with the other three. It can therefore be concluded that the wholesale operators' networks have been brought to at least 14,700 localities (the sum of Fiberhost, Nexera and Tauron), representing 28% of all localities in Poland. Fiberhost covered 9,800 villages, accounting for 19% nationwide.

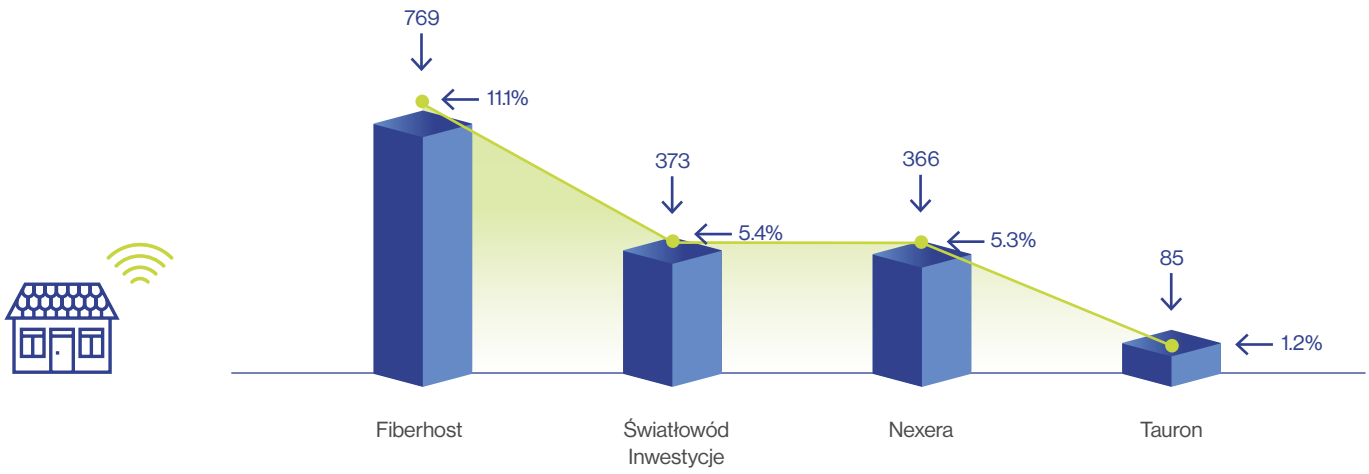
Figure 108
Number of localities connected to open broadband networks (in thousands)



Source: UKE, based on data provided by operators

The largest number of buildings (769,000) were in Fiberhost's coverage, accounting for 11.1% of all buildings in Poland.

Figure 109
Number of buildings connected to open broadband networks (in thousands)



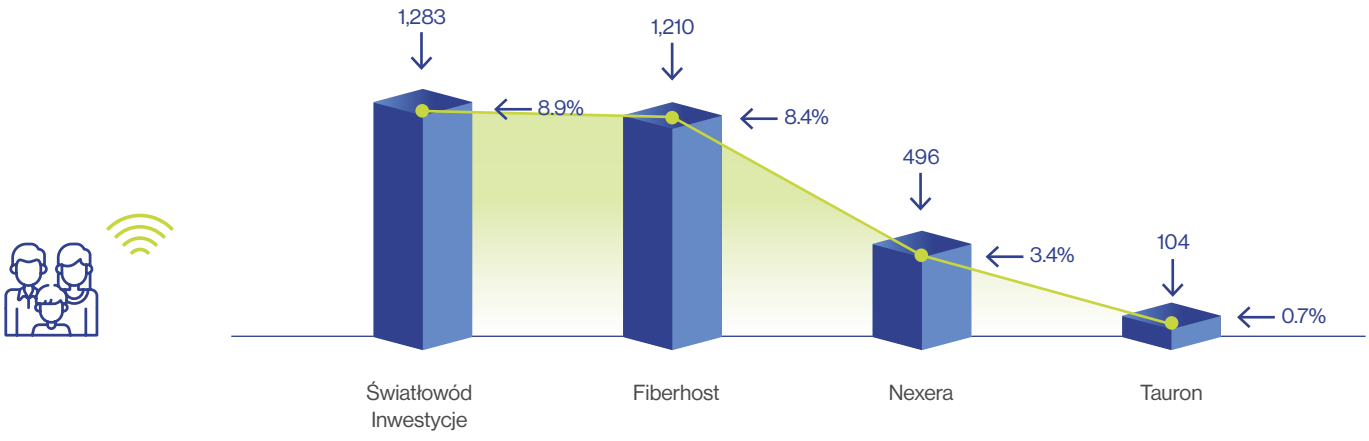
number of buildings connected to open broadband networks [in thousands]

share in Poland

Source: UKE, based on data provided by operators

In the case of households, the largest market share was held by Światłowód Inwestycje, which had in its coverage area 1,283,000 of them, and this accounted for 8.9% of all farms nationwide.

Figure 110
Number of households connected to open broadband networks (in thousands)



number of households connected to open broadband networks [in thousands]

share in Poland

Source: UKE, based on data provided by operators

The coverage of wholesale networks is steadily increasing. The wholesale market will develop mainly in the direction of providing FTTH networks. Operators are putting investment emphasis on such networks.

5.3 | Potential of fiber optic wholesale networks

Operators of open wholesale networks make them available in full to all stakeholders on an equal basis. They themselves do not use their own networks to offer retail services to end users – thus do not compete with entrepreneurs using their networks. Such a cooperation model should be transparent to service providers, who can use open wholesale networks to increase the reach of its operations without having to invest money in building its own networks. Access was used by 7 leading service providers with nationwide coverage and offered their own services to end users through them. At the same time access to open wholesale networks was used by many local entrepreneurs.

Table 2
Number of nationwide entrepreneurs using open wholesale networks

Name of the wholesale	Number of entrepreneurs benefiting
Światłowód Inwestycje	6
Fiberhost	7
Nexera	7
Tauron	7

Source: UKE, based on data provided by operators

Table 3
Number of entrepreneurs actively using open wholesale networks

Name of the wholesale	Number of entrepreneurs actively using
Światłowód Inwestycje	12
Fiberhost	58
Nexera	54
Tauron	25

Source: UKE, based on data provided by operators

Open access to wholesale fiber optic networks can have a significant impact on the shape and development of the telecommunications market both in terms of network coverage and competitiveness of the services offered. Poland is no exception in this regard. The wholesale trend is clearly visible in most European countries.

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