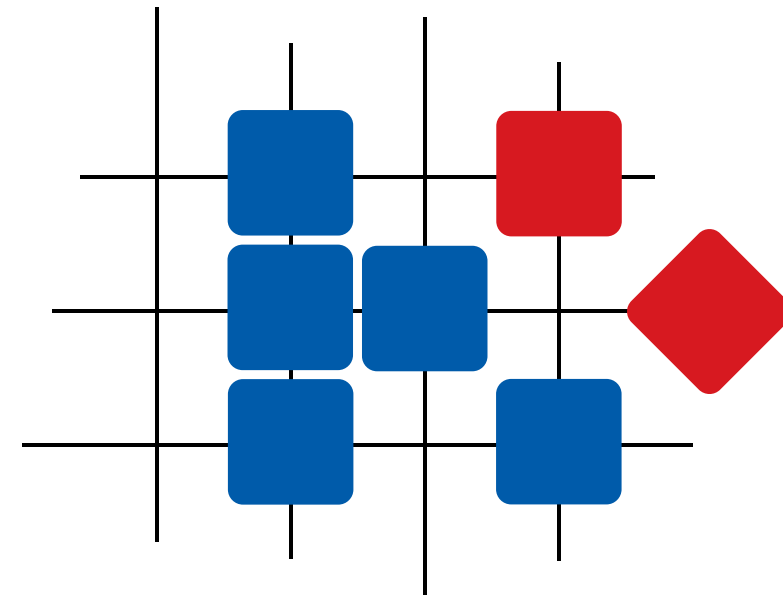




2023 ANNUAL ACTIVITY REPORT

ZAGREB, MAY 2024





Pursuant to the Electronic Communications Act, the Croatian Regulatory Authority for Network Industries (HAKOM), hereby submits to the Croatian Parliament and the Government of the Republic of Croatia its Annual Activity Report for the year 2023.

The financial statement and final statement are integral parts of this Report.

TABLE OF CONTENTS

A WORD FROM THE COUNCIL.....	4
A WORD FROM THE EXECUTIVE DIRECTOR	4
SUMMARY	5
ELECTRONIC COMMUNICATIONS.....	9
POSTAL SERVICES.....	31
RAIL SERVICES	44
RF SPECTRUM MANAGEMENT	54
CONSUMER PROTECTION.....	65
HAKOM'S OTHER ACTIVITIES.....	74
FINANCIAL STATEMENT.....	90

A WORD FROM THE COUNCIL



Council of HAKOM: Mislav Hebel, Nikola Popović, Tonko Obuljen, Marko Jukić, Ante Milas

The year 2023 was a very dynamic year. The Council of HAKOM adopted several important decisions, which will have an impact on further market development.

Following a six-week auction procedure, on 8 March 2023, HAKOM allocated the radiofrequency spectrum for mobile communications networks in the frequency bands with licences expiring at the end of 2024 and the remaining spectrum for regional coverage. The licences were issued for a fifteen-year period and may be renewed for another five years. The auction raised a total of EUR 339m.

In July 2023 HAKOM adopted decisions on market analysis related to the provision of the retail broadband internet access service and other electronic communications services, such as the IPTV and fixed-line telephone services. The first segmentation by technology was carried out, dividing the market into the low capacity market and the high capacity market. Based on a detailed geographic analysis of the market at the level of local self-government units, the high capacity market was split into competitive and non-competitive areas. The previous regulatory obligations of the operator with significant market power in the competitive areas of the high capacity market were repealed.

The electronic communications market continued to grow, its revenues totalling EUR 1.7bn, up 7.1 percent from the previous year. This growth means more than just a figure, it reflects an ongoing search for high-quality and reliable communications services that enable millions of HAKOM's users to carry out their everyday activities.

Special emphasis should be put on significant infrastructure investments, reaching EUR 505m this year, which were made primarily in mobile communications networks due to the mentioned allocation of the radiofrequency (RF) spectrum early in the year. Not only did this investment growth improve network coverage and speed, but it also laid the basis for future innovations and advances.

The development of very high capacity networks (VHCNs) offering gigabit speeds is a key step towards digital future. Investments in VHCNs enabled 68 percent of users to access these advanced technologies, which is especially important in rural areas, where the accessibility increased from 19 to 26 percent. We are proud to mention that the number of FTTH/B connections rose by 34 percent in 2023, which brought the number of households enjoying the benefits of a fast and stable internet connection up to 260,000 at the end of the year.

Another priority was to expand 5G networks, with the result that the 5G signal coverage increased to reach 83.4 percent of Croatia's overall territory and 80 percent of rural areas. In addition to improving the speed and quality of communications, this technology also sets the ground for further technological development and innovations.

HAKOM takes constant care of network security and service quality. We are glad that network neutrality in Croatia adheres to regulations and that our efforts in cybersecurity have contributed towards minimising the number of major incidents. HAKOM monitors service quality on an ongoing basis, including universal service quality, in order to be able to provide the best possible service to its users at all times.

Digitalisation and changes in shopping habits have made a strong impact on the postal services market. Total revenues increased by 10.7 percent in 2023, standing at EUR 308m. In contrast with the traditional means of written communication, which decreased in volume, the volume of parcel deliveries rose significantly. International traffic stabilised, recording a 15 percent growth relative to the previous year. The Croatian Post retained a major share in the market, despite a slight decline in the number of services, while the shares of other providers went up. The universal service quality remained satisfactory, and the number of inspection supervisions increased to ensure compliance with standards.

In the European Union the railway plays a crucial role in facilitating smart, safe and resilient traffic networks. In 2023, a total of 15.1 million tonnes of goods and about 24 million passengers were transported in the Croatian rail services market. Although freight transport declined slightly, passenger transport rose by a significant 28 percent over the previous year. The infrastructure manager's Network Statement was analysed and verified during the year and panel discussions were held for the dialogue with all stakeholders to be improved. Inspection supervisions aimed at the protection of passenger rights and the regulation of the rail services market were also in the focus of HAKOM's work.

In retrospect, the year 2023 was very successful for all sectors falling within HAKOM's competence. Thanks to the efforts of all participants, we achieved a considerable progress and paved the way for even bigger successes in the future.

Council of HAKOM

A WORD FROM THE EXECUTIVE DIRECTOR



Executive Director Miran Gosta

A high level of protection of the rights of service users is imperative in HAKOM's work. In 2023, we focused on aligning the regulations with actual market needs, monitoring the regulatory implementation by operators and informing users about their rights and obligations as well as about the characteristics of services, while also attending to the needs of special social groups. The number of requests for dispute resolution between service users and service providers in electronic communications decreased by 23 percent, growing by 91 percent in postal services. In the rail services area passengers resorted less often to the third instance of rights protection.

HAKOM's inspection powers are essential to control regulatory compliance, the provision of universal service, the protection of rights of users and passengers, the improvement of quality, security and integrity of networks and services and the ensuring of radio equipment conformity. HAKOM's inspectors carry out inspections and controls in all three relevant markets, instituting misdemeanour proceedings and filing motions for indictment for the violations of the regulatory framework.

The previous year was also hallmarked by the completion of the system of control and measuring stations, which is used for controlling and supervising radio frequencies, measurements for frequency planning as well as for detecting and eliminating the causes of interferences in the RF spectrum. The control and measuring station set up on the Bilogora mountain (PKMP Bilogora) ensured the control of the RF spectrum in the Bjelovar-Bilogora County and the Virovitica-Podravina County. This measuring station expanded the HR's capacities for RF spectrum measurements as a yet another facility constituting a part of the critical national infrastructure and the national security system. As regards spectrum control, the year 2023 was marked by major technological advances, adapting to market needs and uplifting HAKOM's capabilities in measuring service quality in mobile communications networks, the most complex type of regulatory measurements. As regards the activities related to the future of the RF spectrum, the most important achievement was securing the first orbital and frequency resources

for the Republic of Croatia in the ITU's Fixed-Satellite Service Plan at the World Radiocommunication Conference (WRC).

HAKOM's administrative service carries out expert, administrative and technical tasks, having within its competence the exercise of HAKOM's public authority. We base our work on our fundamental values: transparency, reliability and independence, while striving to increase the efficiency and productivity of HAKOM's administrative service. In 2023, we realised some very important organisational projects and continued to digitalise our operations. The e-Licence system was upgraded and completely modernised and three new services for the users of HAKOM's services were set up: e-Licences for mobile, fixed and amateur radio stations. In addition, the new ERP system was implemented to increase the efficiency of financial management and control. HAKOM streamlined its risk management by adopting the Risk Management Strategy, assessed strategic and operational risks, established the risk register and appointed risk coordinators. The first quality management self-assessment was conducted by means of the CAF (Common Assessment Framework), a formalised system for the documentation of processes, procedures and responsibilities aimed at achieving quality-related policies and objectives; the system's compliance was proved and the final assessment report produced and submitted to the e-SUK system of the Ministry of Justice.

In 2023, we fully initiated the Regulatory Impact Assessment (RIA), developed guidelines and forms for setting up the RIA in HAKOM and designed the implementation process. HAKOM's employees acquired the required competences to make the RIA in HAKOM fully operational, which will improve the enactment of regulatory decisions and contribute towards market development. The first projects within the systematic application of the RIA methodology in HAKOM were launched in 2024.

Miran Gosta

01

Summary



ELECTRONIC COMMUNICATIONS

The electronic communications market continued to develop and grow in 2023. Total market revenues reached EUR 1.7bn, rising 7.1 percent from 2022. Investments totalled EUR 505m, which is an increase of 26 percent relative to 2022, generated primarily by investments in mobile communications networks resulting from the allocation of the RF spectrum early in the year. Investments in fixed networks held almost steady from the previous year, with a rise recorded in investments in new very high capacity networks (VHCNs), which provide gigabit speeds and are accessible to about 68 percent of users/households. Investments in 5G networks continued and the 5G signal coverage was expanded. Total coverage in the HR reached 83.4 percent, while the rural area coverage was about 80 percent.

The broadband internet access service generated the bulk of market revenues, close to EUR 815m, and has continued to grow. The main driver of revenue growth was the service of internet access via mobile networks, whereas revenues generated by the service of internet access via fixed networks hovered around EUR 250m, as in the last several years. In 2023, the availability of broadband access via VHCNs, used by about 430,000 users/households, increased from 62 to 68 percent in overall and from 19 to 26 percent in rural areas. The number of FTTH/B connections increased the most, by 34 percent, with over 260,000 households having this service contracted at the end of the year. Predictably, revenues from fixed line telephone services continued to decline, while revenues from services in mobile communications networks and television grew.

The overall condition of network neutrality in Croatia is satisfactory, which is an indication that the smooth functioning of the internet ecosystem is ensured. The cybersecurity and general security of networks is becoming more and more important, both in the EU and in the HR. Out of several security incidents reported in 2023 only one, caused by a software error, was considered as significant. The quality of services, including the universal service, is monitored on an ongoing basis and it is satisfactory.

As regards regulatory measures, the analyses of the market for wholesale local access provided at a fixed location (M1/2020) and the market for wholesale central access provided at a fixed location for mass-market products (M3b/2014) were completed, with the result that a different approach to market regulation was adopted. In addition, the BU-LRIC+ cost model was updated, used to set the prices of regulated wholesale services, a cost model to verify the possibility of economic replication of VHCNs was designed, decisions were adopted on the deregulation of the market for wholesale voice call termination on individual mobile networks and the market for wholesale voice call termination on individual public telephone networks provided at a fixed location, the analyses of the market for wholesale dedicated capacity (M2/2020) and the market for wholesale trunk segments of leased lines – non-competitive relations (M14/2003) were initiated and the reasonable rate of return on invested capital (WACC) in the fixed and mobile networks was updated.

There were 118 inspection supervisions in the electronic communications market, some of which were carried out to verify the implementation of previously adopted decisions. Inspection supervisions focused on regulatory compliance, the universal service provision, the protection of user rights, the quality and security of communications networks, the conformity of radio equipment, the efficient use of the RF spectrum, network neutrality, the prevention of unsolicited electronic communications and the timely payment of right of way fees to real estate owners.

POSTAL SERVICES

Digitalisation and changes in shopping habits have continued to heavily influence the postal services market, as evidenced by a decline in the quantity of traditional means of written communication, such as letters and printed matter, and an increase in the volume of parcel deliveries. Total revenues grew 10.7 percent in 2023, reaching EUR 308m, although the total number of services provided decreased from 267m to 257m. The number of letters and printed matter dropped by 5.7 percent and 7 percent respectively relative to 2022, whereas the number of parcels increased by 11.6 percent, exceeding 37m. Following an unfavourable period, international traffic flows have gradually normalised. The number of services in international traffic increased, halting the negative trend from the previous years. The number of services in cross-border traffic increased by 15 percent, totalling 19.7m.

The market shares of postal service providers based on the number of services provided changed only minimally: Croatian Post (HP), the universal service provider, provides somewhat more than 86 percent of all services in the HR market and generates slightly less than 60 percent of total market revenues. However, the number of services provided by HP fell by 4.7 percent from 2022, while the number of services provided by other providers grew by 4.1 percent. The share of the universal service in total postal services continued to decrease, but its market share remained the highest at 45.7 percent.

Due to an increasingly low number of traditional postal services from the universal service framework, the share of these services dropped to below 50 percent. The second largest market share of 32 percent was made up by other postal services (letters and parcels services with some added value) and interchangeable postal services accounted for the remaining share of 22 percent. The results of the quality measurement of the universal service in domestic traffic showed that the service is within prescribed limits and at a satisfactory level. The number of offices in the postal network remained unchanged at 1,016.

The unfair financial burden on HP as the designated universal service provider in the HR territory

was EUR 14.7m, following HAKOM's correction. There were 56 inspection supervisions in the previous year, most of them targeted at HP as the largest provider of postal services and the universal service provider. Inspection supervisions focused on the quality of universal service provision and the rights of postal users.

RAIL SERVICES

In the EU, the railway is considered as a mode of transport that should provide smart, safe and resilient traffic networks and the one that can contribute the most to the green transition. There are 19 freight undertakings and 2 passenger undertakings registered in the rail services market, including the incumbent passenger undertaking: HŽ Putnički prijevoz (HŽPP). HŽ Infrastruktura (HŽI), the largest service facilities operator, managed a 2,617 km of railway infrastructure, including 1,013 km of electrified tracks.

In 2023, the rail network was used to transport a total of 15.1m tonnes of goods, 7.2 percent less than in the previous year, with a decrease of 10.7 percent in tonne-kilometres and a decline in train-kilometres. The share of new freight undertakings in total transported goods increased by 0.6 percent relative to that of the incumbent freight undertaking HŽ Cargo, standing close to 62 percent. Nearly 24m passengers were transported in 2023, about 28 percent more than in 2022, but the number of train-kilometres was lower. The infrastructure manager HŽI generated the revenues of EUR 17.6m in 2023, which is a decrease of 6 percent from 2022.

HAKOM's regulatory tasks included the analysis and verification of the infrastructure manager's Network Statement for 2023, 2024 and 2025, providing an opinion on HŽI's draft Operating Plan for 2023 and analysing its regulatory financial statements. Two panel discussions were organised in 2023 with an aim of providing a forum for the dialogue of all interested stakeholders in the rail market.

This year also saw 22 inspection supervisions conducted for the purpose of regulating the rail services market and protecting rail passengers' rights. Service facilities operators were subject to 18 inspection supervisions, while the remaining inspection supervisions were related to railway undertakings and the infrastructure manager.

RF SPECTRUM MANAGEMENT

The beginning of 2023 saw the completion of an electronic public auction for the RF spectrum in the 800 MHz (791-821/832-862 MHz), 900 MHz (880-915/925-960 MHz), 1800 MHz (1710-1785/1805-1880 MHz), 2100 MHz (1920-1980/2110-2170 MHz), 2600 MHz (2500-2570/2620-2690 MHz) frequency bands at the national level and in the 3600 MHz (3400-3480 MHz) frequency band at the regional level. The total amount of fees for the right to use the RF spectrum at the national and regional levels collected at the auction was EUR 339,186,745.00.

The World Radiocommunication Conference (WRC 2023), held in Dubai, the United Arab Emirates, in late 2023, addressed the worldwide use of radiofrequency resources. HAKOM secured the orbital and frequency resources for the HR's communication satellite coverage at the 63°E position in C and Ku frequency bands, thus enabling the HR to use the orbital position independently.

There were altogether 155 analogue radio networks in operation: 11 public networks (Croatian Radio-Television (HRT): 3 at state and 8 at regional levels) and 144 commercial networks (3 at state, 3 at regional, 16 at county and 122 at city/local levels) as well as 1 digital multiplex radio. TV broadcast via terrestrial transmitters was enabled by 4 terrestrial digital television networks with national coverage and 2 local networks. All national and local free-to-air networks transmit DVB-T2, H.265/HEVC encoded signal in HD quality.

In addition to protection from interferences, spectrum monitoring and control included protection from unauthorised electromagnetic field levels. The daily and periodic measurements of the RF spectrum and the planned measuring campaigns were carried out successfully. Also carried out were electromagnetic field measurements in the areas of increased sensitivity for health protection purposes. All measurement reports were disclosed and are publicly available.

CONSUMER PROTECTION

There were 690 disputes in the electronic telecommunications area in 2023, a decline of almost 23 percent from 2022, which continued a long-standing downward trend in the number of disputes between users and operators. The bulk of user protection activities included creating preconditions for improving user protection, such as: informing and educating consumers, monitoring complaint resolution by operators, cooperating with the representatives of consumer complaint commissions and consumer protection associations as well as analysing general terms and con-

ditions, special conditions, and price lists. Throughout this period users had access to free applications, such as HAKOMetar and HAKOMetar Plus, Cost Estimate and the Do Not Call Register.

There were 235 requests for the resolution of disputes concerning postal services in 2023, approximately 91 percent more than in the previous year, but still 26 percent less than in 2021. Most of the requests received, 88 percent, regarded disputes with the universal service provider, HP, while the remaining requests concerned other postal service providers. As regards the type of complaint, most of the complaints concerned the loss of a postal item, followed by the complaints about failure to provide a postal service and the damage/loss of contents of a postal item. As regards the type of postal item, the bulk of the complaints (61 percent) referred to parcels.

In 2023, 8 decisions were adopted pursuant to rail passenger requests. Most passenger complaints were related to the implementation of Regulation (EU) 2021/782 of the European Parliament and of the Council on rail passengers' rights and obligations and to the General terms and conditions of the transportation contract (tariff for the transport of passengers in domestic traffic – Tariff 101), including the reimbursement for tickets, the timetable and the HŽPP website information.

The most vulnerable consumer groups – the elderly, persons with disabilities and children – were also devoted attention. Cooperation was continued with the University of Zagreb Faculty of Electrical Engineering and Computing within the accessibility project, involving the participation of interested associations for persons with disabilities. In 2023, the project focused on improving rail transport accessibility for persons with disabilities. HAKOM pays special attention to children as the users of electronic communications services. In 2023, HAKOM marked the Safer Internet Day by participating in the Pledge for a Better Internet conference, organised by the Partners in Learning association, CARNET and National CERT.

HAKOM'S OTHER ACTIVITIES

HAKOM continued to implement activities falling within the area of responsibility of the Broadband Competence Office (BCO), being a member of the European Broadband Competence Offices Network (BCO Network). HAKOM continued to develop and improve the organisation to be able to facilitate the performance of any potential tasks. The introduction of the RIA was completed at the end of 2023 in line with HAKOM' own strategy for better regulation. HAKOM continued intensive cooperation with international expert bodies and working groups, participating

in their work, primarily the EU and BEREC, International Telecommunication Union and the international organisations of regulators for all three markets falling within HAKOM's competence.

FINANCIAL STATEMENT

In 2023, revenues totalled EUR 13,886,642 and were largely generated by fees for the performance of HAKOM's other activities in the electronic communications area, fees for the RF spectrum management and fees for the addressing and numbering space management. The rise in revenues from the previous period was due to increases in fees for the performance of HAKOM's other activities in the electronic communications area and fees for the performance of activities related to the regulation of the rail services market, as HAKOM significantly reduced fees for the RF spectrum management in the previous year to use surplus revenues carried forward from the previous periods.

In 2023, expenditures were recorded at EUR 13,980,057. In addition to regular operating expenditures, a major investment was the construction of the Bilogora control and measuring station, including the acquisition and installation of the measuring equipment. As planned, the current-year revenue deficit, amounting to EUR 93,415, was covered by the revenue surplus from the previous years.



02

**ELECTRONIC
COMMUNICATIONS**

ELECTRONIC COMMUNICATIONS

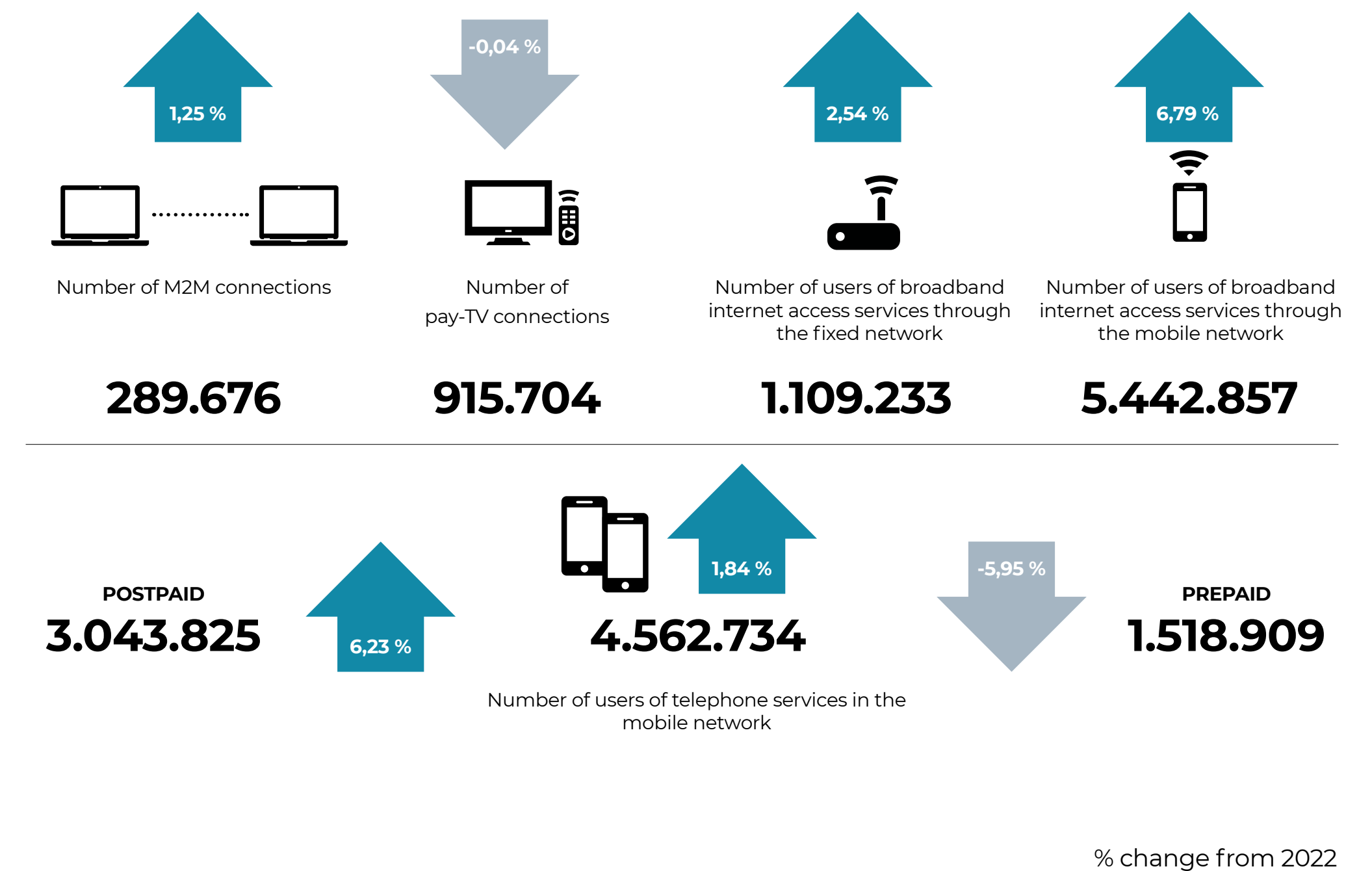
Total investments in the electronic communications market grew 27 percent in 2023, while investments in VHCNs increased more than 13 percent compared with 2022. At the end of 2023, 39 percent of broadband internet access connections was installed via VHCNs, which is an increase of more than 16 percent from the end of 2022.

The most important tasks included the completion of the analyses of the market for wholesale local access provided at a fixed location (M1/2020) and the market for wholesale central access provided at a fixed location for mass-market products (M3b/2014), which resulted in the adoption of a different approach to market regulation. In addition, the BU-LRIC+ cost model, used to set the prices of regulated wholesale services, was updated and a public consultation on the procedures of determining these prices was initiated; a cost model to verify the possibility of economic replication of VHCNs was designed; decisions were adopted on the deregulation of the market for wholesale voice call termination on individual mobile networks and the market for wholesale voice call termination on individual public telephone networks provided at a fixed location; the analyses of the market for wholesale dedicated capacity (M2/2020) and the market for wholesale trunk segments of leased lines – non-competitive relations (M14/2003) were started, and the reasonable rate of return on invested capital (WACC) in the fixed and mobile networks was updated.

Internet neutrality and openness are consistently complied with in the HR, while the security of electronic communications as well as the security of electronic communications networks and related services in general are becoming increasingly important. The quality of services, particularly the universal service, is monitored on an ongoing basis and it is satisfactory. A new version of [HAKOMetar](#) – an application that enables the independent measuring of the quality of provided internet services. Chapter 7 International cooperation provides more details on EU policies and international events.

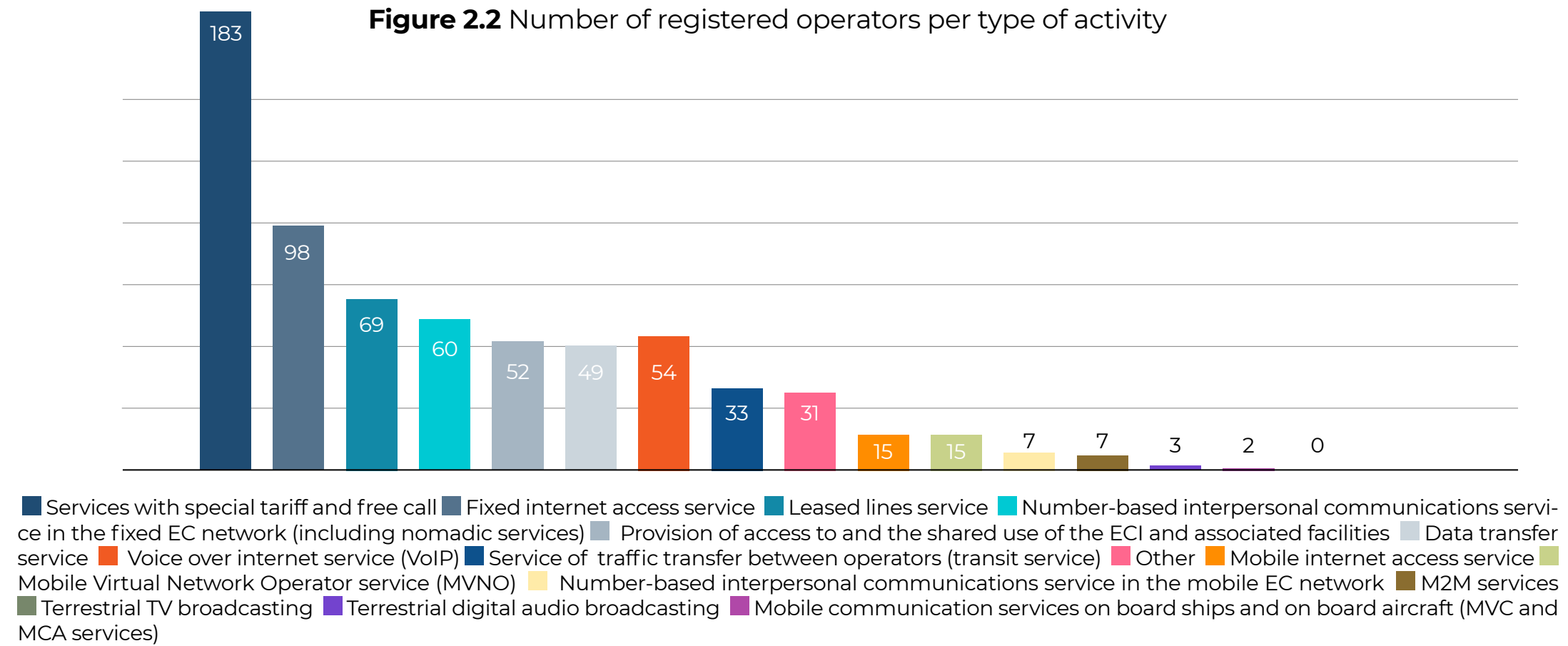
In 2023, data on the electronic communications market were collected by new quarterly questionnaires. Some new indicators were introduced on account of changes in the market, while the method of reporting some indicators was changed. Due to the introduction of new questionnaires, data were collected for 2022 too, with the result that some previously published data were corrected.

Figure 2.1 Basic electronic telecommunications market data



MARKET OVERVIEW

Figure 2.2 Number of registered operators per type of activity



Operators

The operators of public electronic communications networks and publicly available electronic communications services must notify HAKOM of the start, changes to and completion of the provision of activities of electronic communications networks and services. Requests are digitalised in the [e-Operator](#) system. In 2023, 27 prior notifications of the completion of activities were submitted and 37 new notifications of the start of the provision of services were received.

The e-Operator system currently comprises 322 registered operators, providing a total of 678 electronic communications services and activities in the HR territory.

Market revenues

The upward trend in revenues continued in 2023, with the result that total revenues reached EUR 1.7bn at the end of the year. Revenues from services provided via mobile networks increa-

sed the most, by 9 percent, while revenues from services provided via fixed networks grew by 3.5 percent. The ratio of mobile network revenues to total revenues continued to grow as a result, standing at 65 percent to 35 percent in favour of mobile networks.

As in the previous years, the bulk of revenues came from the internet access service, accounting for 47 percent of total revenues, while the highest individual rise in revenues was once again recorded by the mobile internet access service, the largest revenue driver in the electronic communications market in previous periods too. Revenues from the fixed line telephone service continued to decline, continuing the trend from the previous years. Revenues from the pay-TV service continued to grow

Figure 2.3 Total revenues of the electronic communications market (in EUR million)

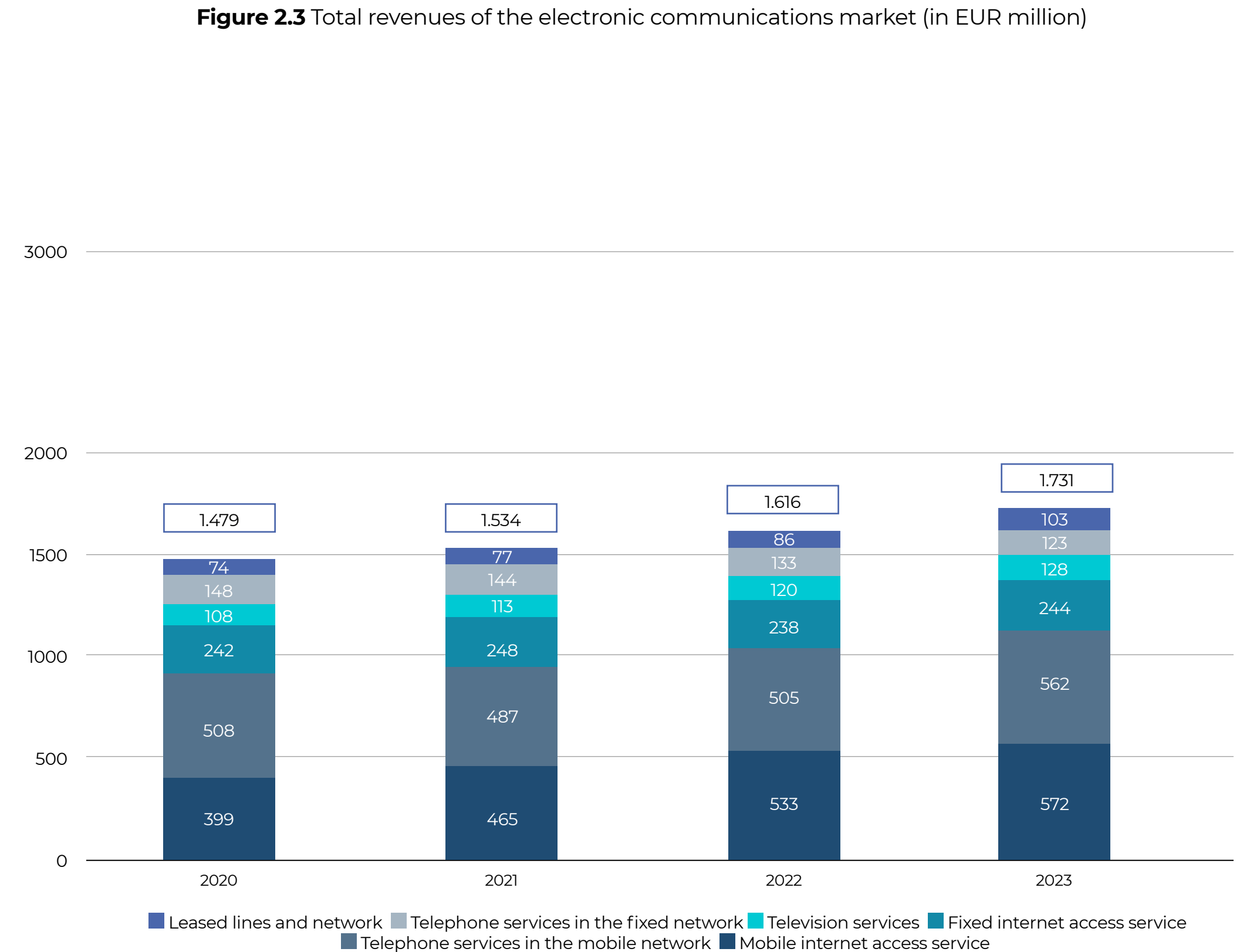
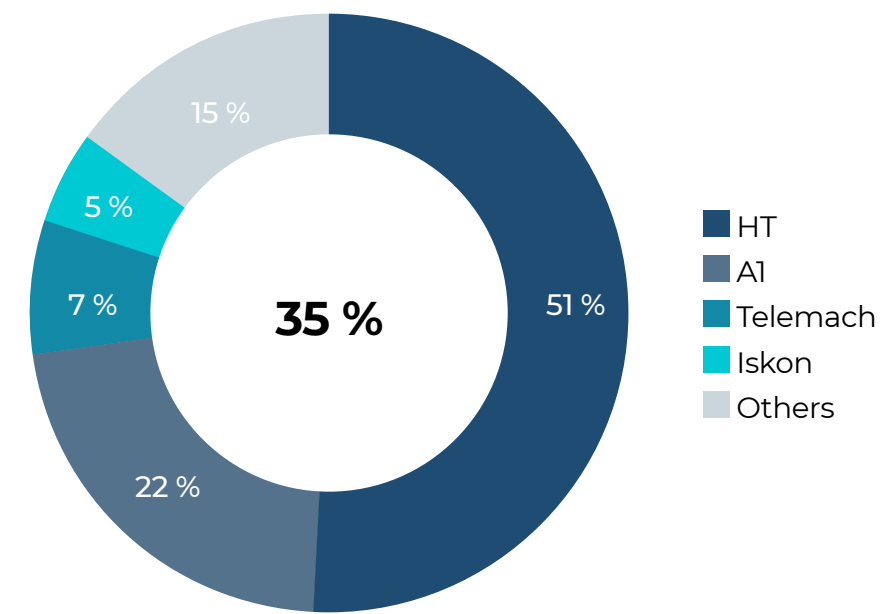


Figure 2.4 Operator revenue shares in the fixed network market and fixed network revenue shares in total revenues



*On 1 January 2024 Iskon was merged with Hrvatski Telekom (HT), continuing to operate as a separate brand within HT.

Figure 2.5 Operator revenue shares in the mobile network market and mobile network revenue shares in total revenues

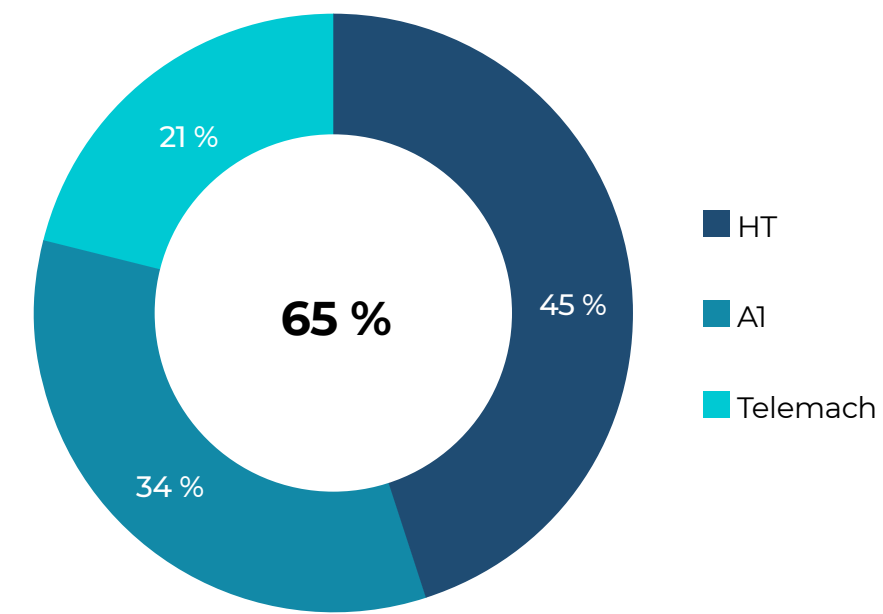


Figure 2.6 Total investments by electronic communications operators in the HR (in EUR million)

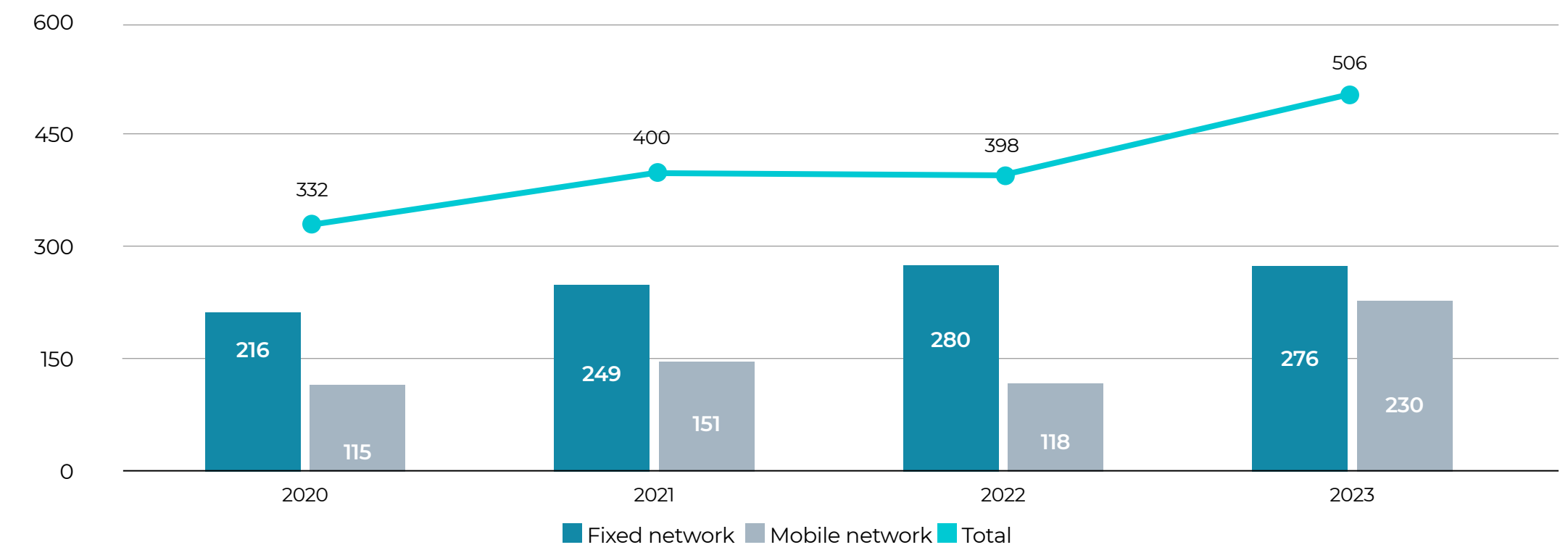
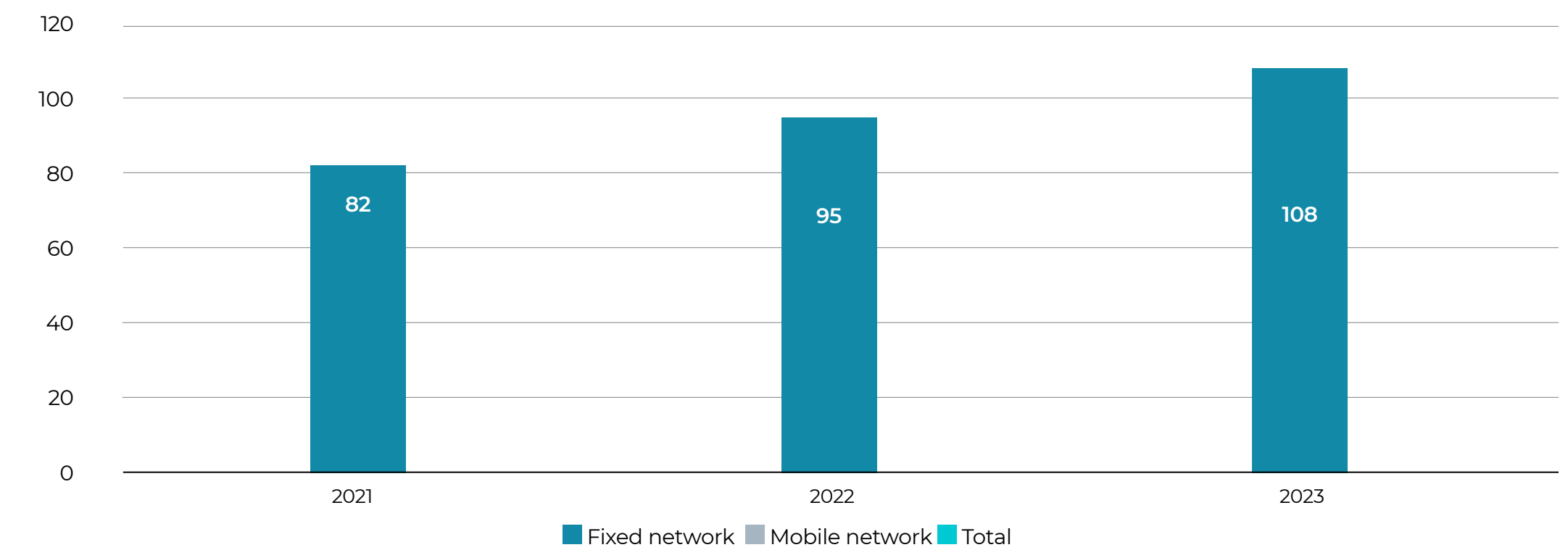


Figure 2.7 VHCN investments (in million EUR)



Investments

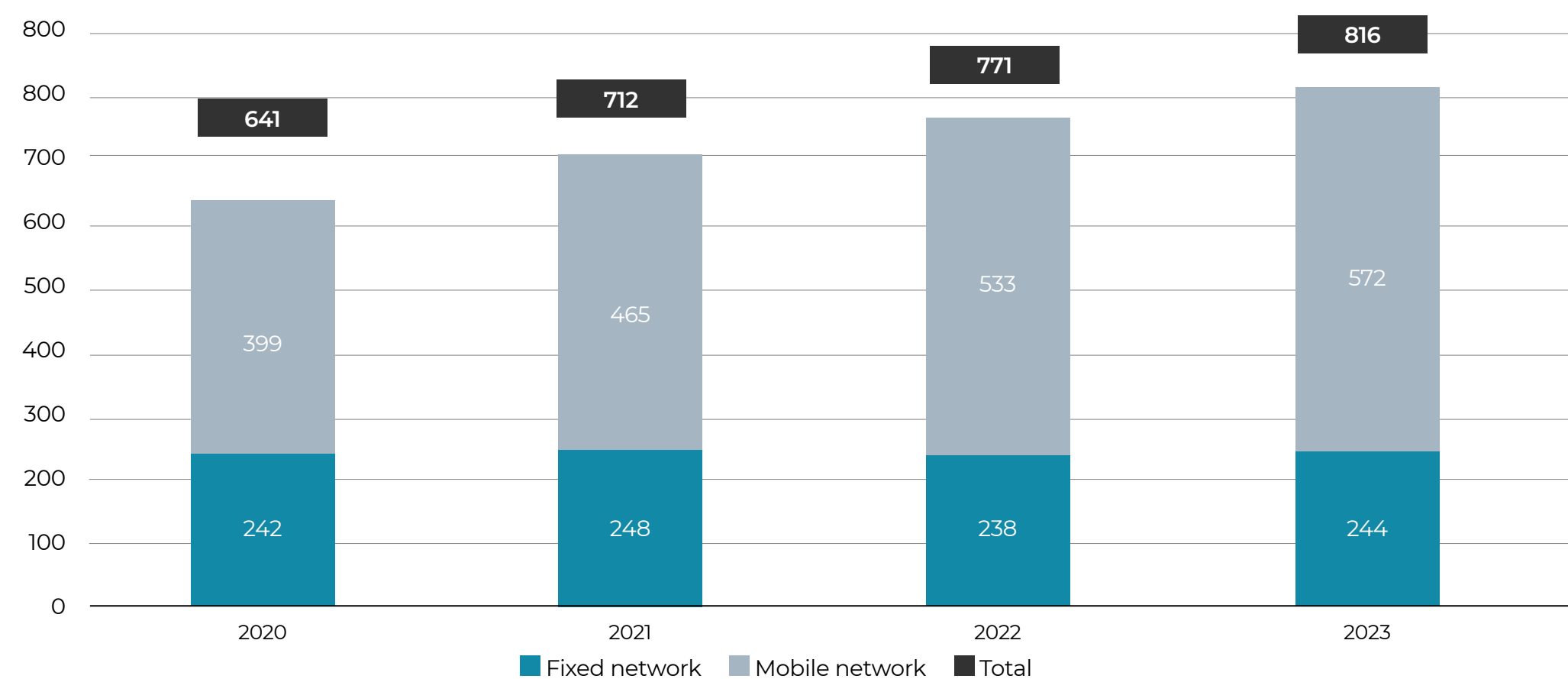
In 2023, total investments of electronic communications operators amounted to EUR 506m, which is an increase of 27 percent due to investments in the mobile network rising sharply from the previous year because of the spectrum allocation in early 2023.

Although total fixed network investments dropped, the investment structure shows an increase of EUR 8m in investments in the fixed network equipment, resulting from continuing investments in new VHCNs. Total investments in VHCNs grew by EUR 13m over the previous year. In contrast, investments in the mobile network equipment reached their four-year low.

BROADBAND INTERNET ACCESS SERVICE

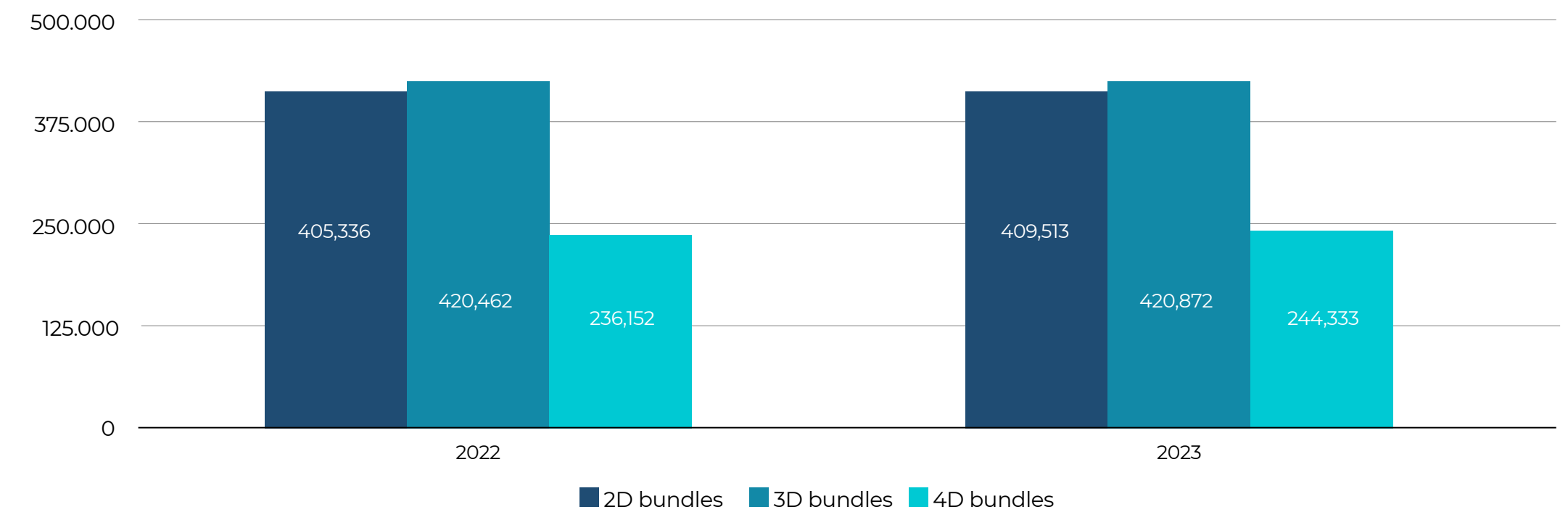
The broadband internet access service generated the majority of close to EUR 816m market revenues and has continued to grow. This increase in revenues was primarily aided by the mobile internet access service, whose revenues rose by EUR 39m relative to the previous year.

Figure 2.8 Total revenues of the broadband internet access market (in EUR million)



The number of users of 4D bundle services, that is, those that are provided all services (both in the mobile and fixed networks) by the same operator, continued to grow, which is an indication that offering the 4D option has a significant influence on market competition. The competitiveness of operators that are currently unable to offer 4D bundles because they do not have their own mobile networks with national coverage depends on the availability of MVNO access offers. There are still no operators in the HR using the MVNO approach.

Slika 2.9 Number of service packages

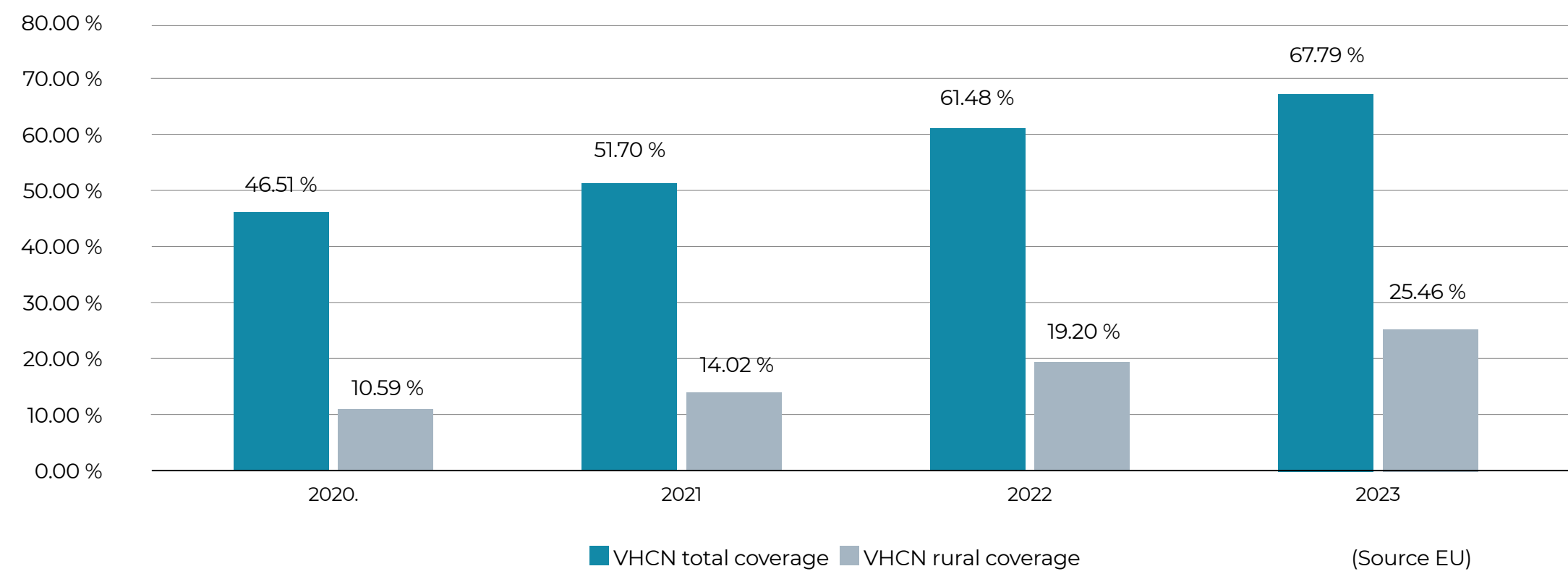


Availability of VHCNs

The main strategic development objectives for the EU's broadband internet access include the maximum possible coverage by 5G networks and VHCNs (FTTH, FTTB, FTTP and DOCSIS 3.1), which currently enable minimum download speeds of 100 Mbit/s and can provide 1 Gbit/s speeds, with a simple upgrade.

In the last few years operators have invested considerable funds in deploying 5G networks and VHCNs, as evident from a continued increase in coverage. Operators' commercial investments are predominantly directed towards areas in which such investments are the most cost-effective, such as urban and sub-urban, densely populated areas. There are still great differences in VHCN coverage between rural and urban areas, which is why a share of costs of VHCN deployment in rural areas need to continue to be subsidised under various state aid programmes.

Figure 2.10 VHCN coverage (% of households)



The deployment of VHCN networks requires major investments, which are profitable only if such networks are sufficiently used. There were 433,000 VHCN connections at the end of 2023 in the HR, with 60 percent of them installed by means of the FTTH/B technology. Although the FTTH network take up rate¹ is still low, the number of FTTH/B connections grew by 66,000 relative to the previous year. Due to the rising number of FTTH/B connections, increasingly higher speeds were contracted, so that 40 percent of end-users had access speeds exceeding 100 Mbit/s at the end of 2023. The number of users with speeds exceeding 300 Mbit/s and 1 Gbit/s also increased sharply. Therefore, given the rising trend in demand for higher access speeds and the current take up rate for newly built FTTH networks, the number of VHCN connections is expected to grow even more strongly in the forthcoming years. The take up is also expected to improve on account of the deregulation of HT group's FTTH networks in some areas of the Republic of Croatia, whose impact, as it came into effect in late 2023, will probably be more visible in the following period.

figure 2.11 5G coverage (% of households)

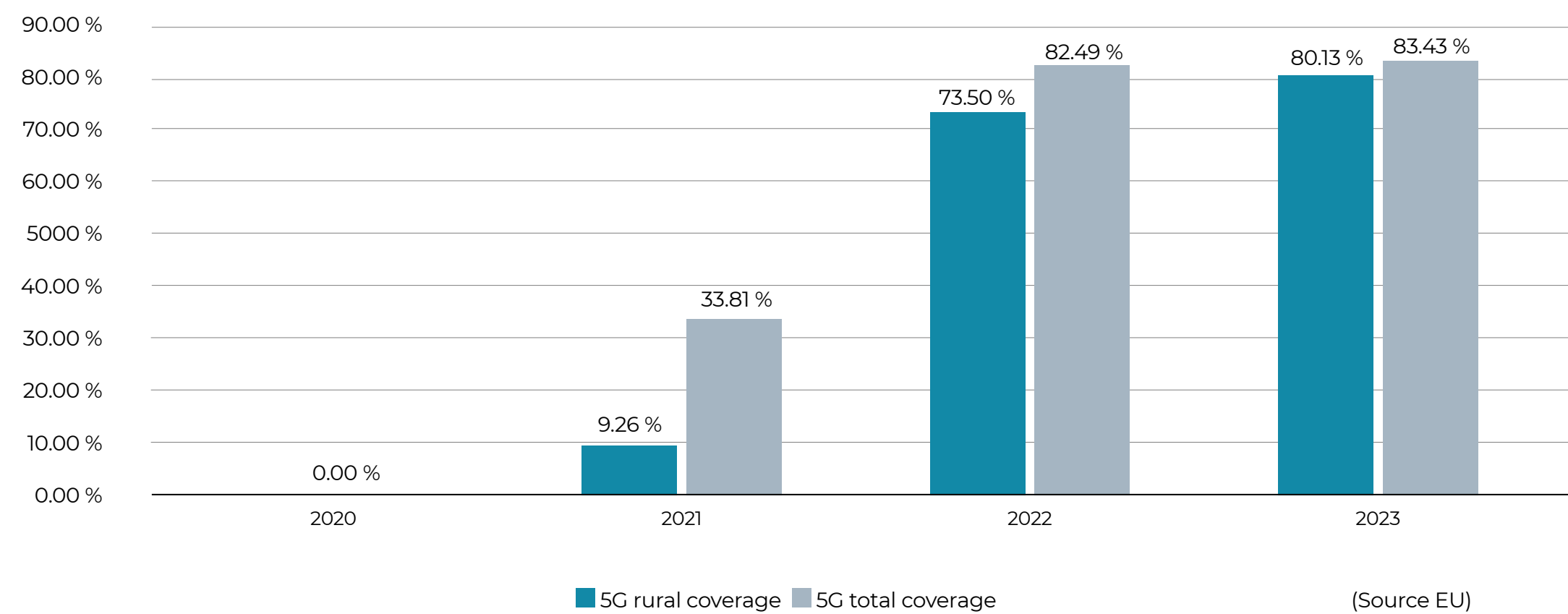
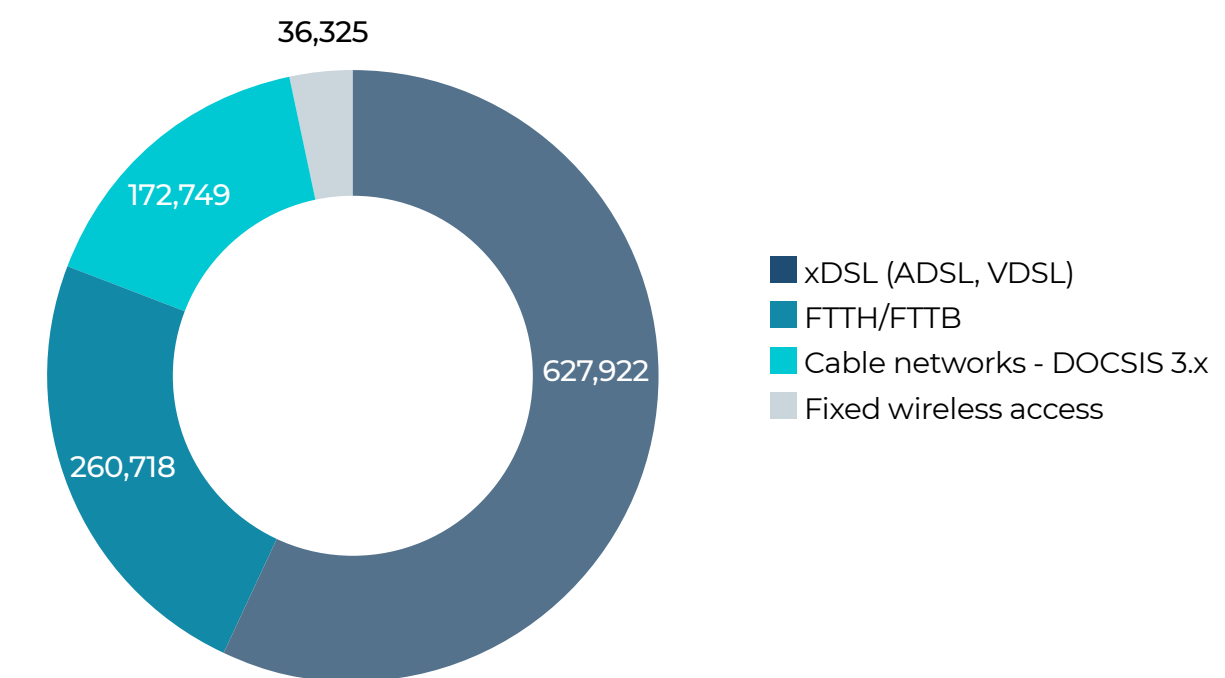


Figure 2.12 Connections by the technology of access networks



¹ The ratio of FTTH connections to the number of users having access to the FTTH network.

Figure 2.13 Figure 2.13 Number of VHCN connections

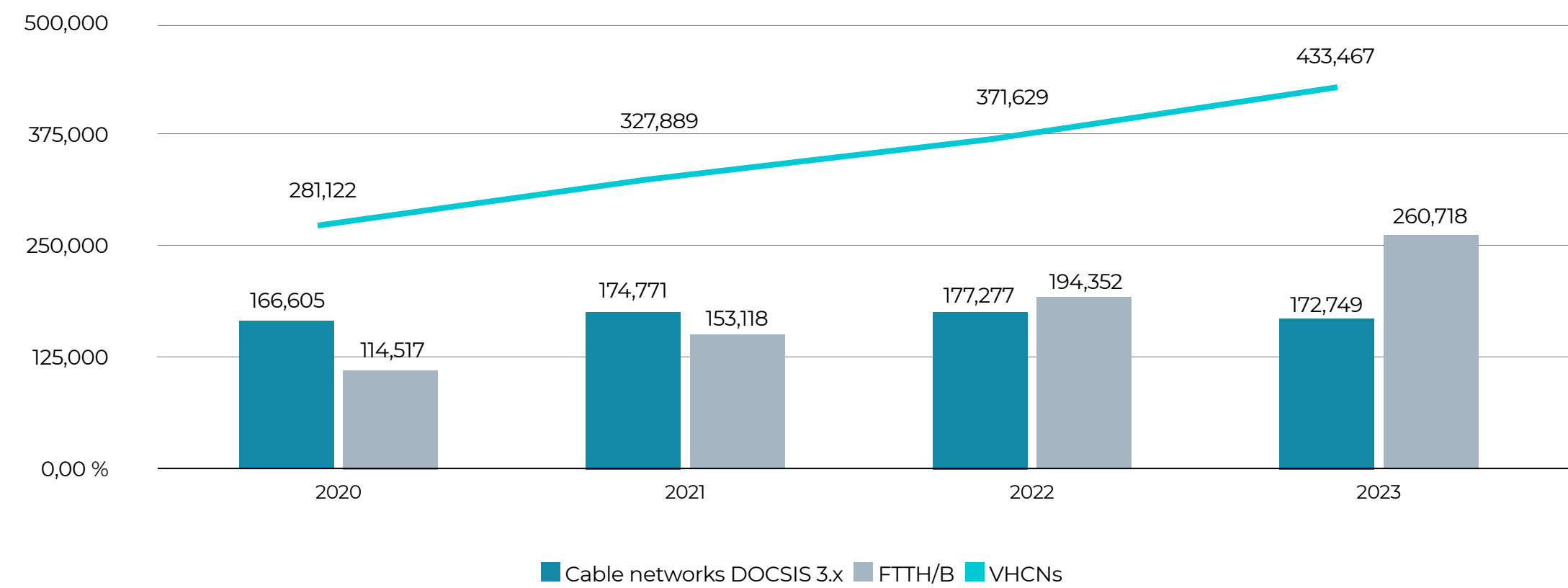
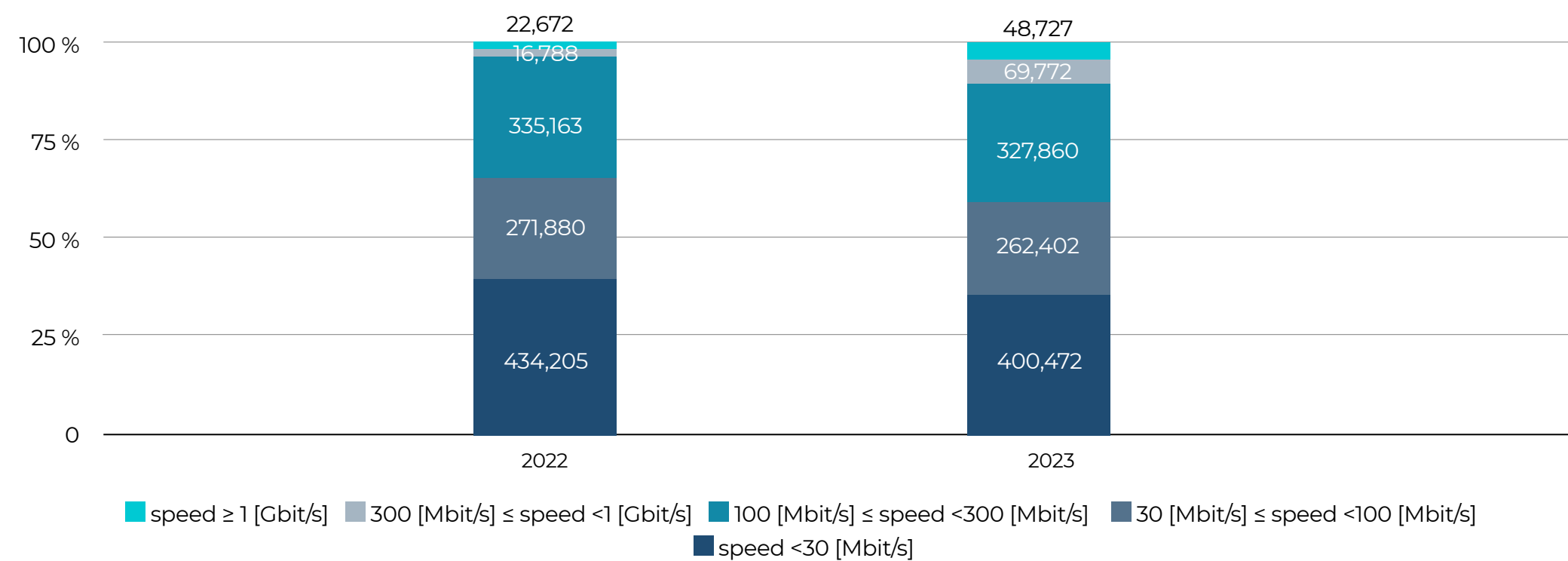
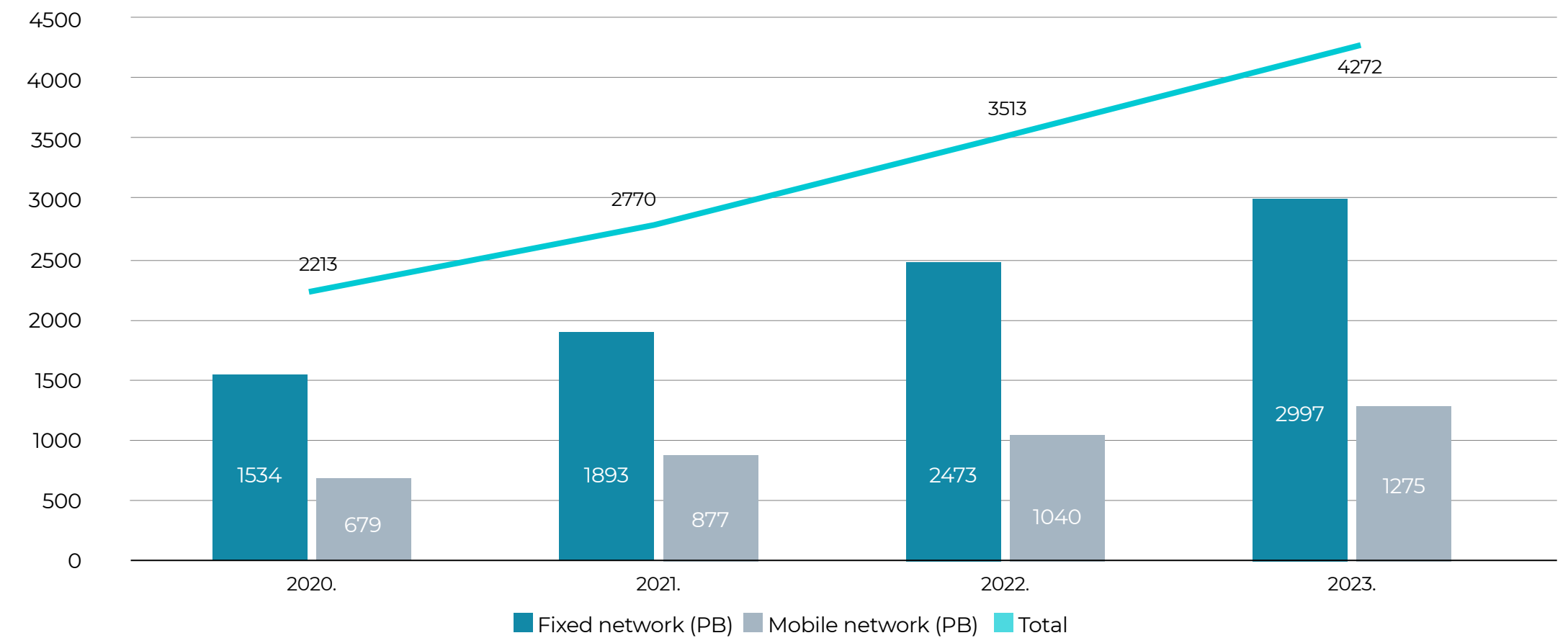


Figure 2.14 Number of fixed connections by contracted access speeds



In addition to the growth trend in high-speed access connections, the year 2023 also saw a continued rise in traffic in both fixed and mobile networks. This is due to the increased digitalisation of all segments of society and in particular to data-intensive applications, such as streaming services and online video games.

Figure 2.15 Data traffic



TELEPHONE SERVICES IN THE MOBILE NETWORK

Revenues from telephone services in the mobile network increased relative to 2022, which can partially be attributed to inflationary price adjustments. Specifically, operators can once a year adjust their services prices to the average annual inflation rate for the previous year, published annually by the Croatian Bureau of Statistics. However, despite the revenue growth this year, mobile outgoing minutes continued to decrease, reflecting a downward trend in the use of traditional telephone services, which are increasingly substituted by OTT services², such as WhatsApp, Viber, Facebook Messenger, etc.

In 2023, the number of users in a subscriber relationship continued to grow, their share exceeding 66%, which is directly related to the increased use of 4D bundles and the tying of mobile and fixed network services.

² Services based on the latest and highest application layer of the internet protocol suite.

Figure 2.16 Total revenues from telephone services in the mobile network (in EUR million)

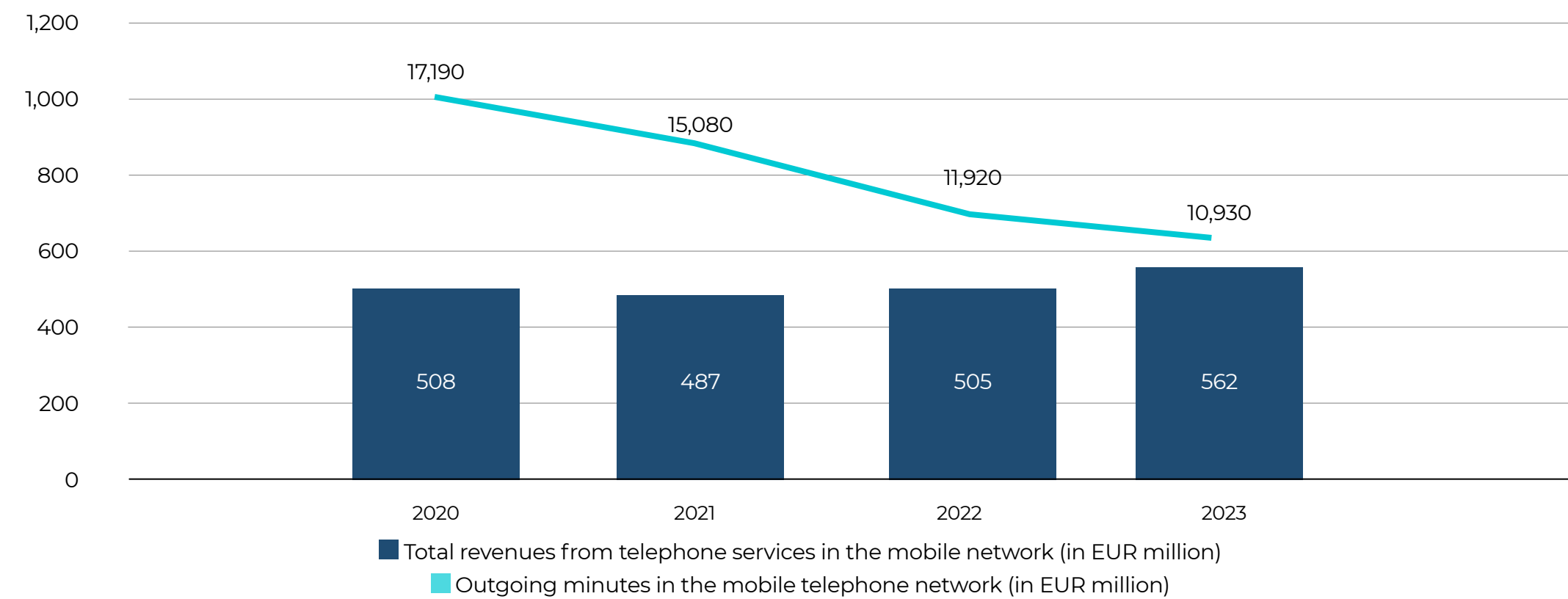


Figure 2.18 Revenues from and the duration of roaming calls made by foreign users in national networks

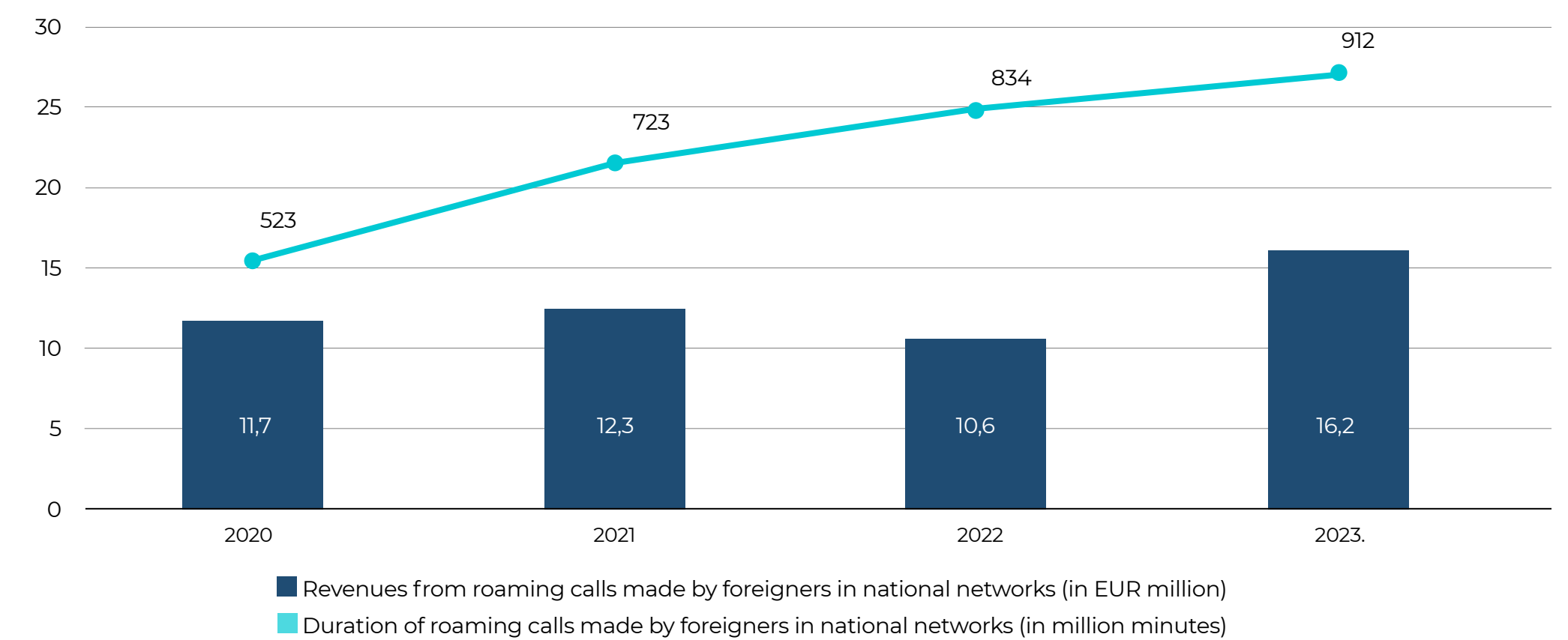
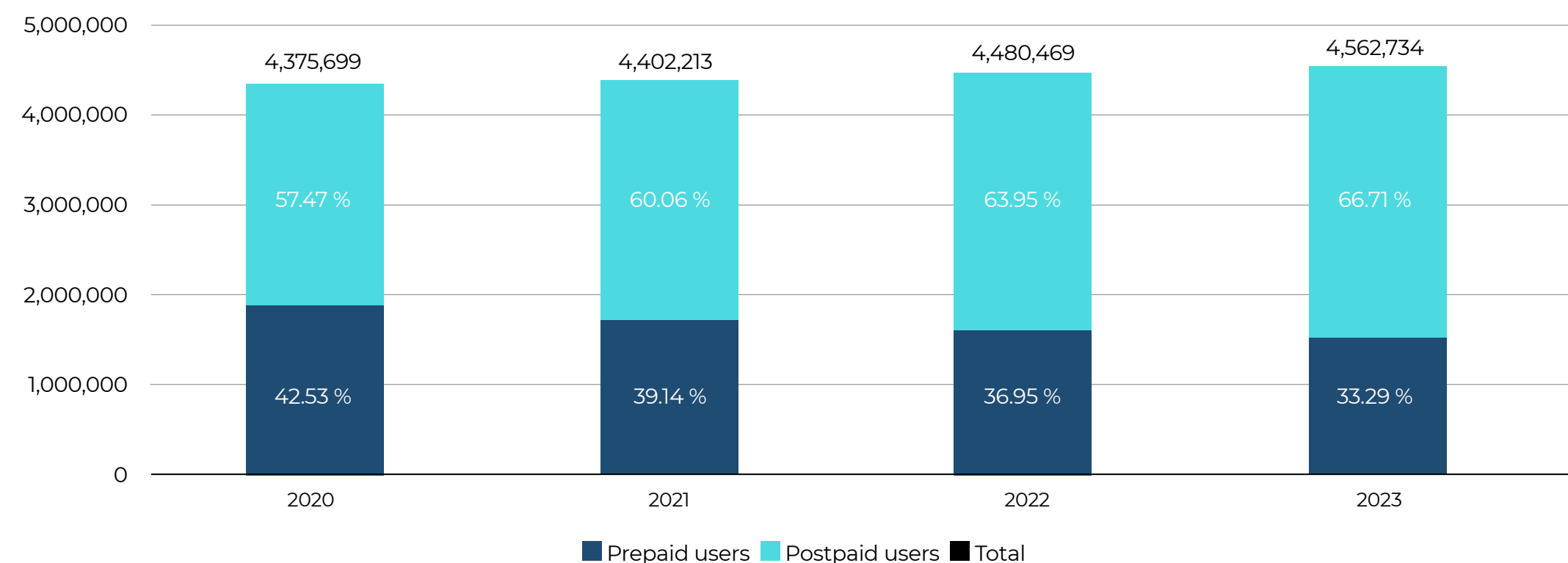


Figure 2.17 Distribution of users by the type of subscriber relationship



TELEVISION AND PAY TELEVISION

The access to the TV programme distribution service is provided through free-to-air TV broadcast from terrestrial transmitters and through various forms of pay-TV platforms. In 2023, HAKOM started to collect data on OTT services rendered by fixed network operators, because fixed network operators began providing their pay-TV services via OTT applications, which means that users do not have to own a connection in the fixed network of an operator to use its pay-TV service. Due to this pay-TV service provision method, end-users, when opting for an internet access service provider, assign less importance to the content offered by the pay-TV service, as they can have the internet access service provided by one operator and use the pay-TV service (OTT service) of other operators. In addition to switching to the operator's own OTT service, users also use various other OTT services that are not provided by electronic communications service operators, such as Netflix, HBO Max and other services.

The number of pay-TV connections held steady from the previous year, while revenues increased by 6.7 percent. As more than a half of pay-TV connections are IPTV connections, the increase in pay-TV revenues was primarily accounted for by a rise in IPTV service revenues, because the number of connections for other pay-TV service provision methods, except for the operator's own OTT services, decreased.

Traffic from roaming calls made by foreign users in Croatian mobile networks continued to grow in 2023, so that the total number of roaming minutes was 20% higher than in the pre-pandemic year 2019, which was due to a strong tourism performance. In addition, revenues from roaming calls made by foreigners increased by EUR 5.6m compared with 2022.

Figure 2.19 Pay-TV connections by technology

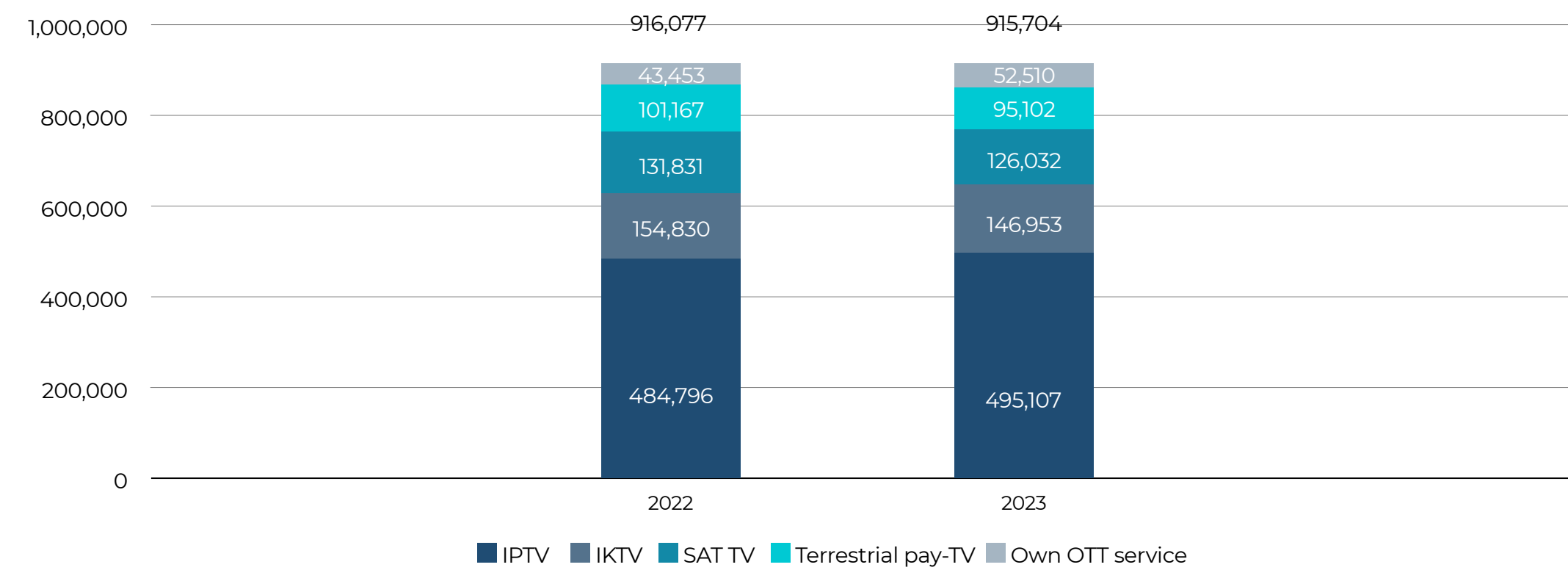
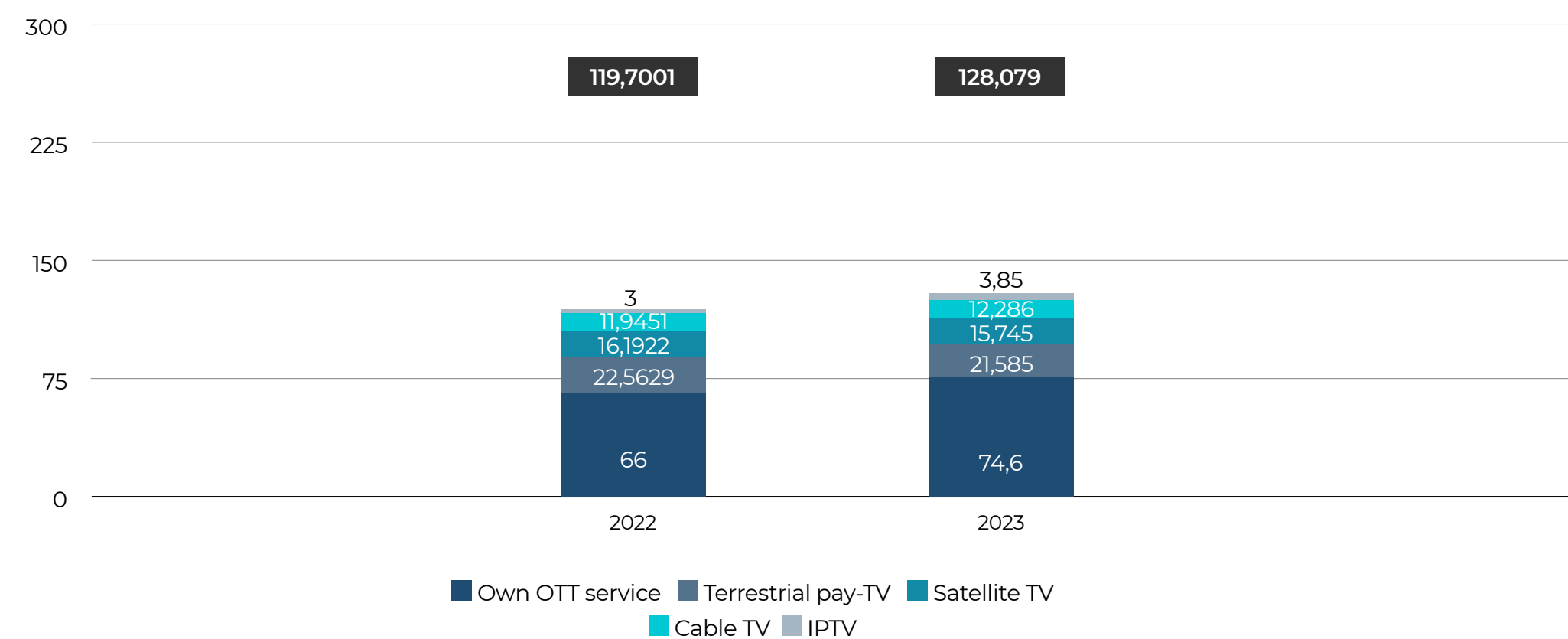


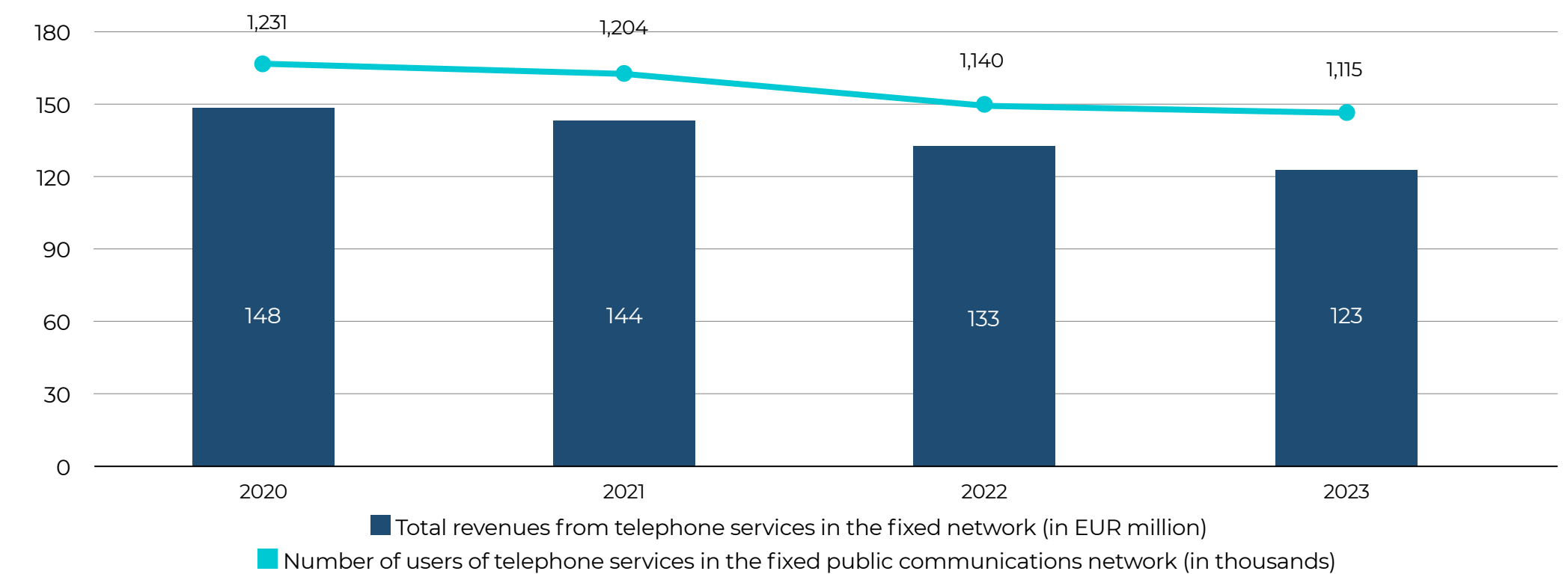
Figure 2.20 Revenues from the pay-TV service by technology (in EUR million)



TELEPHONE SERVICES IN THE FIXED NETWORK

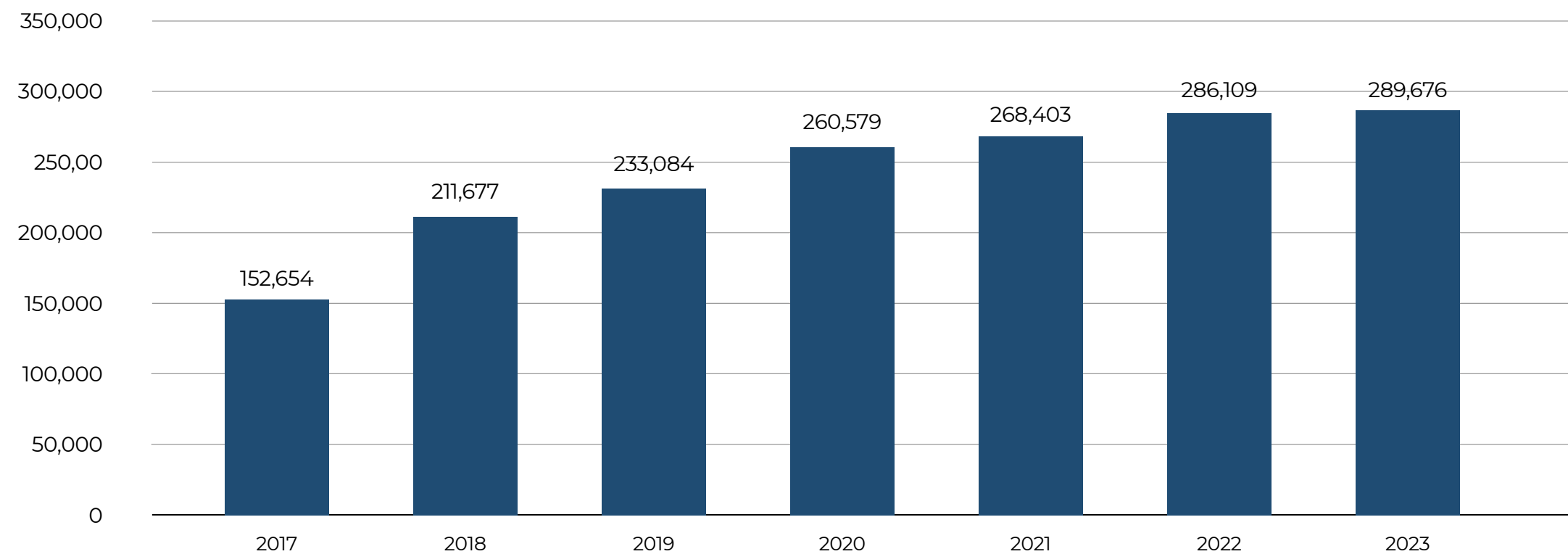
The number of users of telephone services in the fixed network continued to fall and so did the number of total minutes and total revenues these services generate. This was expected given the long-standing trend of replacing these services with mobile telephone services and various OTT services, such as WhatsApp, Viber, Facebook Messenger, etc.

Figure 2.21 Total revenues from and the number of users of the telephone service in the fixed network (in EUR million)



M2M SERVICES

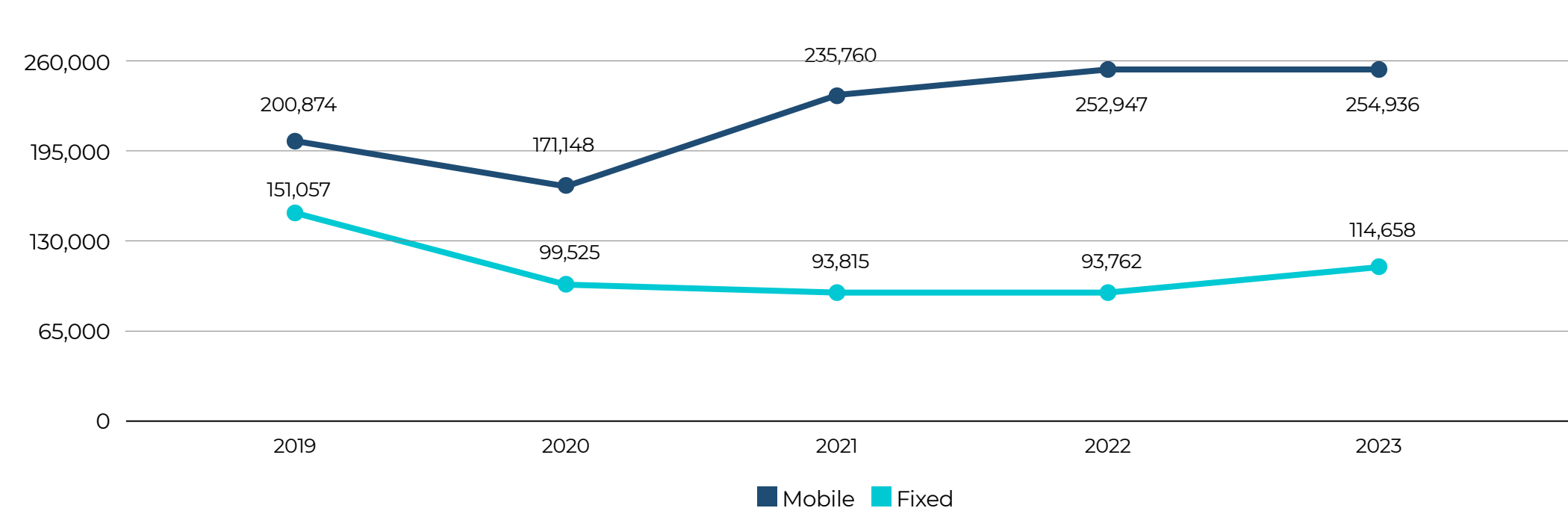
Machine-to-machine communication (M2M), which comprises automated communication, is the backbone of internet of things (IoT). HAKOM timely determined the appropriate numbering for these services in its Numbering Plan. M2M communication finds its application in many sectors (automotive industry, construction, building management, aviation, agriculture, postal services, transport, sensors). In most of these sectors the solutions applied focus on location tracking, the proactive maintenance of industrial machines and the reading of their statuses as well as on reporting technical incidents. Given the technological advances, M2M communication is expected to gain even more importance in the future, while continuous roaming becomes more and more important for numerous M2M/IoT applications as many devices remain connected to the network outside their own home network/country throughout their useful life.

Figure 2.22 Number of M2M connections

SWITCHING OPERATORS/NUMBER PORTABILITY

In 2005, HAKOM introduced the number portability service in such a way that users could select the optimal operator in accordance with their needs and habits and switch to another operator's network while keeping the existing number.

For this process to function efficiently, HAKOM takes care of the timely upgrading and regular maintenance of the Central Administrative Database of Ported Numbers (CADPN). A high-quality administrative and technical process of the number porting service is important for the satisfaction of end-users and indispensable for the sustainable market competition of operators.

figure 2.23 Number of ported numbers in the fixed and mobile networks

SERVICE PROVISION QUALITY

The manner of provision of the activities related to electronic communications networks and services as well as quality criteria for electronic communications networks and services are prescribed in detail in the [Ordinance on the manner and conditions for the provision of electronic communications networks and services](#). This ordinance requires the operators of publicly available electronic communications services to regularly publish relevant, up-to-date and comparable data on service quality indicators. More precisely, operators with revenues exceeding 2 percent of the total revenues of the relevant electronic communications services market, or those required to do so by HAKOM, must measure service quality at their own expense at least every six months or, exceptionally, upon HAKOM's request, in shorter intervals. Upon the completed verification of the submitted indicators, HAKOM, at least every six months, publishes [data on the quality of service provision by operators](#) on its website.

Universal services in electronic communications are the services of a specified quality that must be available to all end-users at an affordable price throughout the HR territory, regardless of their geographical location, with as little distortion of competition as possible. In September 2022, a decision was adopted designating HT as the universal operator for the provision of access to the telephone service, internet access service and public payphone service in the whole HR territory for a period of two years, until December 2024. HT, as the universal operator, is obliged to provide a minimum access speed of 7 Mbit/s to each end-user at a fixed location in the HR territory, which, at the time of the submission of the request, it cannot provide with any of its standard packages. HT also has an obligation to make this package available to the socially vulnerable group of end-users at a 65 percent discount (previously 50 percent), without conditioning this discount on the establishment of an obligatory subscriber relationship that could potentially aggravate such users' financial situation. Furthermore, HAKOM set additional discounts and benefits for persons with disabilities. Special conditions for the socially vulnerable groups of end-users make the internet access service and the public phone service available to the most sensitive social group and enable the digital inclusion of the socially vulnerable group, i.e., the access to a minimum range of digital services (e.g., public services and the educational digital content for children and young people). [Annual indicators on the quality of universal service provision](#) are available on HAKOM's website.

INTERNET NEUTRALITY, OPENNESS AND QUALITY

In the Republic of Croatia, HAKOM is competent for the implementation of rules on the protection of open internet access in compliance with [Regulation \(EU\) 2015/2120](#) of the European Parliament and of the Council laying down measures concerning open internet access and amending Directive 2002/22/EC on universal service and users' rights relating to electronic communications networks and services. With an aim of fulfilling this task adequately, in 2016 HAKOM set up a multidisciplinary team for the implementation of network neutrality rules, which is in charge of a variety of issues related to network neutrality, procedures and interpretations and communicates with operators providing the internet access service (resolution of end-user complaints, market research and the collection of information, in particular technical information gathered by network monitoring).

In 2023, HAKOM did not receive any complaints from end-users regarding difficulties with the use of the internet access service involving either the blocking or slowing down of applications and services or price discrimination. There were also no major changes as regards the introduction of new products or services. The knowledge of the public about open internet access and readiness for cooperation of internet service providers (ISP) can be described as commendable. [The Annual Report on the implementation of Regulation \(EU\) 2015/2120](#) for 2023 once again confirmed the ongoing positive situation when it comes to the open internet access in the HR³. HAKOM will continue to monitor the market to ensure compliance with the Regulation, taking measures as appropriate. Only two inspection decisions were adopted during this reporting period, with all the addressed issues resolved, as a rule, through the dialogue with ISPs.

The overall state of network neutrality in Croatia is generally positive, which indicates that the smooth functioning of the internet ecosystem is ensured. The Regulation and Guidelines have contributed to the gradual improvement of the quality of the internet access service provided in the HR, primarily by increasing the transparency of information on the services provided and a non-discriminatory and open access to internet content, services and applications. HAKOM's supervisory and measurement tools, such as HAKOMetar and HAKOMetar Plus, are available to the public and currently adequate for the analysis and monitoring of derogations from the provisions of the Regulation. In the cases of violations of network neutrality rules, after consultations with HAKOM, operators addressed the issues and eliminated the irregularities.

According to available data, three quarters of the EU population have no access to the IPv6 protocol and there are considerable differences across Member States concerning its application. As suggested by the internet society, Europe is a continent of contrasts as far as this issue is concerned. The European Commission (EC) stated that IPv6 was "a necessary precondition for digital

Europe" because of the shortage of IPv4 addresses that Europe is faced with today. Specifically, IPv4 offers an addressing space of about 4.3 billion addresses. However, the success of the internet, the variety of usage and the spreading of connected objects are gradually draining the pool of available IPv4 addresses. In 2023, HAKOM cooperated with other national institutions, primarily the Central State Office for the Development of the Digital Society (CSODDS) and the Croatian Academic and Research Network (CARNET), in defining the model of cooperation between all competent institutions in the HR and operators, aimed at promoting the IPv6 transition in the country. These activities implemented by HAKOM and all other stakeholders of this transition must be long-term national activities.

Survey on user habits and experiences

In late 2023, a [survey on the habits and experiences of internet users in the Republic of Croatia](#) was conducted on a representative sample of 1,000 respondents aged 18 to 65. The survey showed that usage habits concerning electronic communications services did not change considerably in the last three years. The mobile voice service, fixed access service and IPTV service are the most used services by the users surveyed. Most of the respondents (77 percent), use the internet access service as part of the service bundle, while even 92 percent of them (3 percent more than in the previous two years) stated that the service bundle contained all the services they need. The most used electronic communications services are the mobile voice service (98 percent), internet access service (82 percent) and fixed voice service (56) percent.

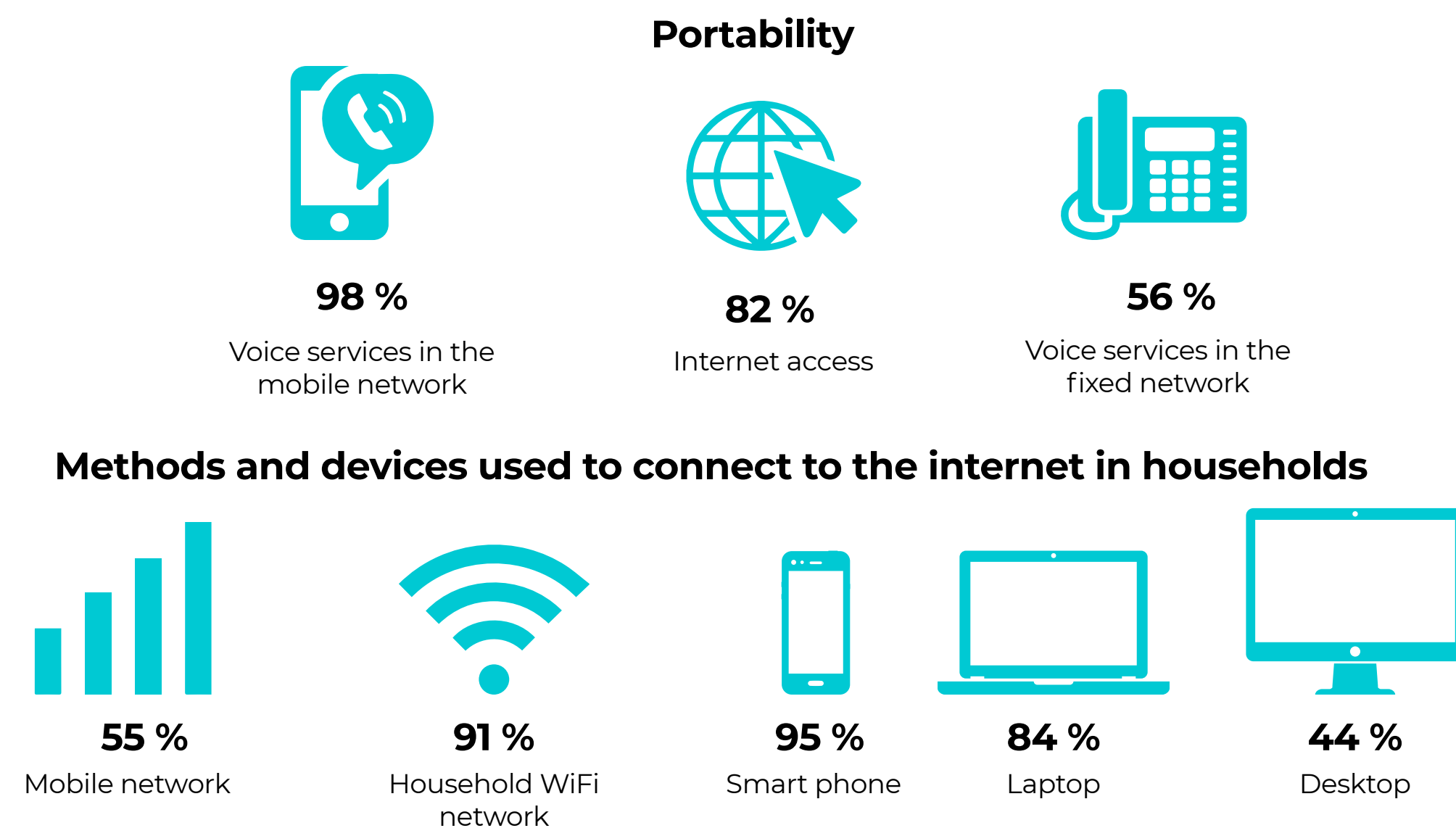
Most users, as much as 91 percent of them, use the home WiFi network to connect to the internet, while 55 percent of them connect via the mobile network. The most used connection devices are smartphones (95 percent) and laptops (84 percent), while desktop computers are used by as few as 44 percent of respondents. The internet is used for e-mail correspondence by 88 percent of users, while 85 percent of them use it for social networking and 83 percent for voice calls and internet video calls. More than 50 percent of the respondents stated that they would like to use the internet for teleworking in the future and 38 percent of them would use it for education. Internet speed, chosen by 78 percent of the users surveyed, and low package prices, chosen by 74 percent, remained the most important to users when opting for an operator. As much as 62 percent of the respondents switched operators once or several times, while 54 percent indicated that the rival operator offering a lower price was the most common cause for the switch. A price increase of 10 to 20 percent would have an impact on the change of operator, while 37 percent of users were not certain whether they would change the operator if the price was raised up to 10 percent.

³ The Report is submitted to the European Commission and BEREC and published.

Almost one third of the users, 29 percent, never checked their internet speed, while 36 percent of the respondents with internet speeds lower than 100 Mbit/s stated that they either had no need for higher speeds or were not willing to pay more for faster internet. More than 50 percent of the users stated that they were informed on the maximum and normal speeds by their operators and 46 percent were informed of the minimum speed. The survey showed that one fifth of the respondents used HAKOMetar and HAKOMetar Plus, while 57 percent of the respondents were not familiar with these applications. The most frequent difficulties encountered by users in 2023 were poor internet speed and problems with the WiFi network and equipment. Nevertheless, user satisfaction with services was relatively high. Most of the internet users had the experience of contacting customer support and 55 percent of them contacted customer support several times. In general, users were satisfied, more with response quality than with response speed.

Almost all of the internet users took some action to maintain internet safety. They mainly avoided downloading application from unknown sources, used passwords, protected their personal data and did not contact unknown persons. However, 17 percent declared that they had experienced a cyber-attack or cyber bullying, 3 percent more than in the previous year.

Slika 2.24 Results of the survey of user habits and experience



HAKOMetar and HAKOMetar Plus

In order to improve the monitoring of contractual conditions connected with the quality (speed) of the broadband internet access service, prescribed at the EU level by the Regulation, as far back as in 2012 HAKOM began providing end-users and operators, free of charge, with a certified tool for the measuring of access speeds in the fixed network:- [HAKOMetar](#). HAKOMetar is an official certified tool that enables users to independently check service quality using their own personal computers. The test results are acceptable as evidence in end-user complaint resolution proceedings as, pursuant to the [Ordinance on the manner and conditions for the provision of electronic communications networks and services](#), operators are required to indicate the minimum, regular and maximum speeds in contracts and advertisements and the minimum speed must not be less than 70 percent of the maximum speed. HAKOMetar was significantly upgraded in September 2023 and its functionality was improved. Measurements taken with this tool may be used for informative purposes when individual measurements are conducted or for certified measurements when measurement campaigns are launched to establish whether broadband access speeds comply with contracted speeds, with the results serving as evidence in the case a user dispute is initiated. For certified measurements, users must carry out at least three measurements within a five-day period. If all measurements indicate lower than contracted speeds, they may lodge a complaint over the quality of the internet access service. A precondition for the measurement is that the computer used for checking is wired directly to the operator's modem and that all other local network devices are disconnected. The use of the new, altered and upgraded version of the application, which enables users to measure data traffic speeds in fixed electronic communications networks, no longer requires the installation of the Java application, which has lately been disturbing the smooth operation of the HAKOMetar application due to its numerous modifications. HAKOMetar supports all popular computer operating systems, including Windows, Linux and Mac OS platforms.

In 2023, more than 4,400 individual measurements were performed and more than 850 certified measurement cycles were started, only 15 of which were completed and eligible for the submission of complaints due to too low speed. These figures indicate that speeds are in a large percentage provided as contracted and that only a small share of users was denied the guaranteed internet access quality.

In 2017, for the purpose of measuring internet quality in wireless networks (mobile communications networks and WLAN networks), HAKOM launched the free application [HAKOMetar Plus](#). The application provides information on the current internet connection quality and helps raise awareness and knowledge of real data transfer speeds and the wireless network service quality. All measurements are shown on a geographical map of the HR, so that a map of coverage quality is created by means of users' measurements.

Measurement results (over 1,159,000 individual measurements since the application became operational, of which some 59,000 measurements were carried out in 2023) are informative and do not constitute evidence in potential complaint resolution proceedings due to the nature of the service and technology in mobile networks.

These results, summarised in aggregate values for different categories and geographically represented on maps, can be used to compare internet access offers on the market as well as to analyse different internet access offers or offer ranges provided by operators and their market penetration. HAKOM also uses these results to verify whether the information on coverage maps and available mobile network speeds published by operators is consistent with the results of user measurements.

Figure 2.25 Internet access speeds measured by HAKOMetar Plus

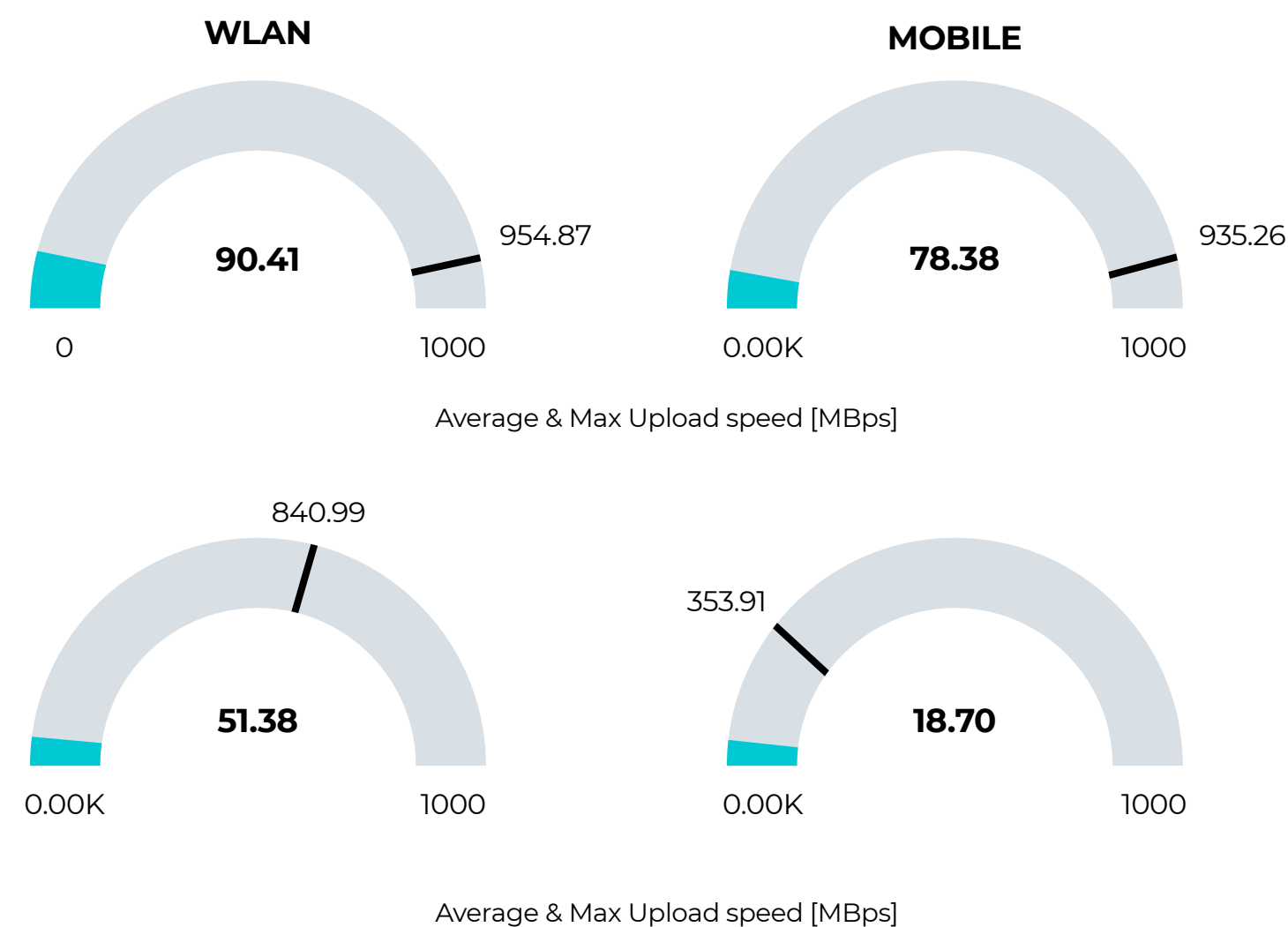
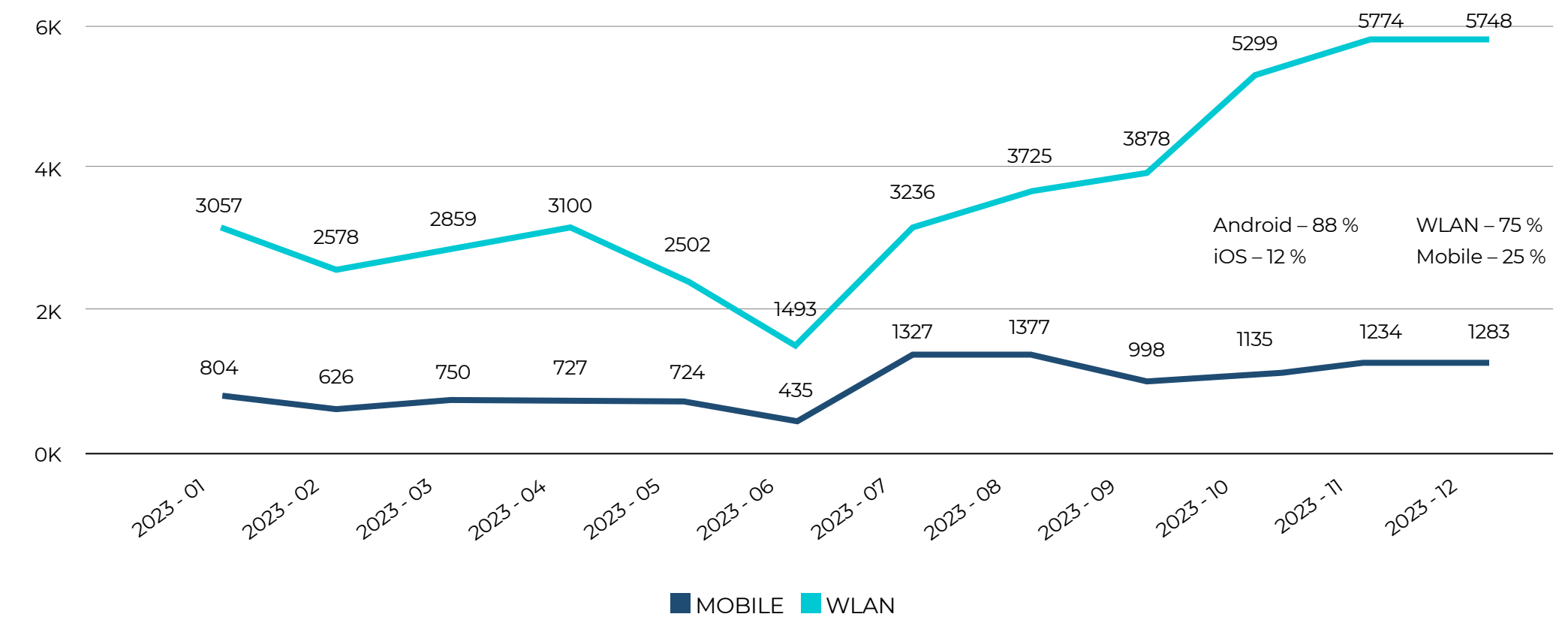


Figure 2.26 HAKOMetar Plus and HAKOMetar measurement statistics



NETWORK AND SERVICES SECURITY

In 2023, HAKOM adopted the new [Ordinance on the manner and deadlines for the implementation of measures for the protection of security of networks and services](#), which lays down minimum security measures, the manner of reporting to HAKOM on major incidents related to electronic communications networks and services and the reporting criteria. In 2023, HAKOM received reports on and analysed different security incidents, reporting one major incident to the European Network and Information Security Agency (ENISA). The incident involved a software error that disrupted fixed network voice services for a considerable number of users. As regards cybersecurity and information system security, HAKOM carried out four inspection supervisions ex officio in 2023 to verify whether adequate measures were taken to ensure the security of networks and services. In addition, in 2023 a HAKOM's representative was appointed vice-chair of the European Competent Authorities for Secure Electronic Communications (ECASEC), a platform for cooperation and the exchange of information among national authorities for the supervision of electronic communications services in Europe. As a member of the national working group for the implementation of NIS 2⁴ HAKOM participated in the drafting of the new Cybersecurity Act. In 2023, numerous activities related to cybersecurity were carried out in cooperation with competent EU authorities, including the Network and Information System Cooperation Group (NIS Cooperation Group⁵).

⁴ <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM%3A2020%3A823%3AFIN>

⁵ [NIS Cooperation Group | Shaping Europe's digital future \(europa.eu\)](#)

In 2023, HAKOM, as in the previous years, observed the instances of unsolicited and malicious domestic and foreign calls made to Croatian operators' networks employing calling line identification spoofing (CLI spoofing), with the caller identification showing a phone number different to the one actually used. The underside of technological advances is that they have given rise to network misuse, an example of which is CLI spoofing, a technique of falsifying the caller identification information to trick the call recipient or the operator receiving the call or message into believing that it has been made by a different person or entity or originated from a different location. An analysis of users' reports showed that such malicious calls did not originate from the networks of Croatian operators that owned the numbers used, but were rather forwarded from other national operators' networks, that is, initiated outside Croatia, illegally displaying Croatian or EU numbers as caller identification. HAKOM implemented appropriate measures to eliminate such calls or at least reduce their number, investigating, in cooperation with other regulatory authorities, their sources and making efforts to curb them. Pursuant to HAKOM's latest amendments to the Ordinance on the manner and conditions for the provision of electronic communications networks and services (entered into force on 1 January 2024), mobile operators are required to implement a system for verifying and blocking incoming foreign calls with Croatian numbers made from mobile electronic communications networks, once they establish and confirm that the end-user of the number is roaming. A system for verifying and blocking incoming foreign calls with calling line identification displaying Croatian geographic numbers has already been implemented in fixed electronic communications networks and has been in use since 1 January 2024.

MANAGEMENT OF THE ADDRESSING AND NUMBERING SPACE

The efficient management of the addressing and numbering space as naturally limited public resources for the purpose of ensuring a reasonable, equal and efficient use of addresses and numbers is based on international regulations and international agreements and treaties binding to the Republic of Croatia. HAKOM manages the addressing and numbering space, planning the use of addresses and numbers, assigning and revoking them, all in accordance with the [Addressing Plan](#) and Numbering Plan. As the number of operators in the EU increases, so does demand for the addressing and numbering space. With the use of new technologies becoming increasingly widespread and giving rise to new services, the technical and regulatory conditions of service provision are becoming more complex. New functionalities were implemented in the CADPN system, while the existing ones were upgraded and improved.

Operators acquire the right to use addresses and/or numbers pursuant to HAKOM's decisions on the primary assignment of addresses and/or numbers. Requests for the primary assignment of addresses and/or numbers are submitted to HAKOM via the e-Operator system.

The data presented in the table below show that there were more applications for the assignment of the addressing and numbering space in 2023 than in 2022.

Table 2.1 Address and/or number allocation – number of decisions

Type of application/decision	2021	2022	2023
Primary assignment	130	79	104
Revocation	29	13	30
Transfer of right	3	10	14

Numbers for fixed electronic communications network services, six-digit SMS/MMS short codes, freephone services and network ID codes were the most required types of addressing and numbering resources in 2023. The table below shows the number of requests for the addressing and numbering space submitted by operators in 2023.

Table 2.2 Number allocation requests

Type of service	Number of requests	Allocated resources (numbering)
Fixed electronic communications network services	41	153,600
Six-digit SMS/MMS short codes	27	38
Freephone services (800 and 801)	11	162
NetID codes	7	7
Public mobile network access codes (NDC 9xxx)	4	130,000
General content services (60)	4	342
M2M access codes (89xx, 890xx)	3	1,200,000
Mobile network codes (MNC)	3	3
Socially sensitive services (EU harmonised short number) 116xxx	2	2

In 2023, two special short numbers from the 116 range of EU-wide harmonised numbers were assigned for services of social value and socially sensitive services. The number 116006 was assigned to the helpline for victims of a crime, used by the Victim and Witness Support Service, while the number 116016 was allocated to the helpline for victims of violence against women, used by the Autonomous Women's House Zagreb. The harmonisation of numbering resources is necessary to make services provided in different Member States available to end-users via the same number. The combination "same number — same service" ensures that a specific service, in whichever Member State it is provided, is always associated with a designated number within the EU. This will provide the service with a pan-European identity to the benefit of European citizens who will know that by dialling the same number they will gain access to the same type of service in any Member State. This measure fosters the development of pan-European services.

The quantity of free addressing and numbering resources, that is, the quantity of addresses and numbers that are free for primary assignment to operators currently completely meets market needs.

Table 2.3 Numbers and the remaining capacity available for primary assignment

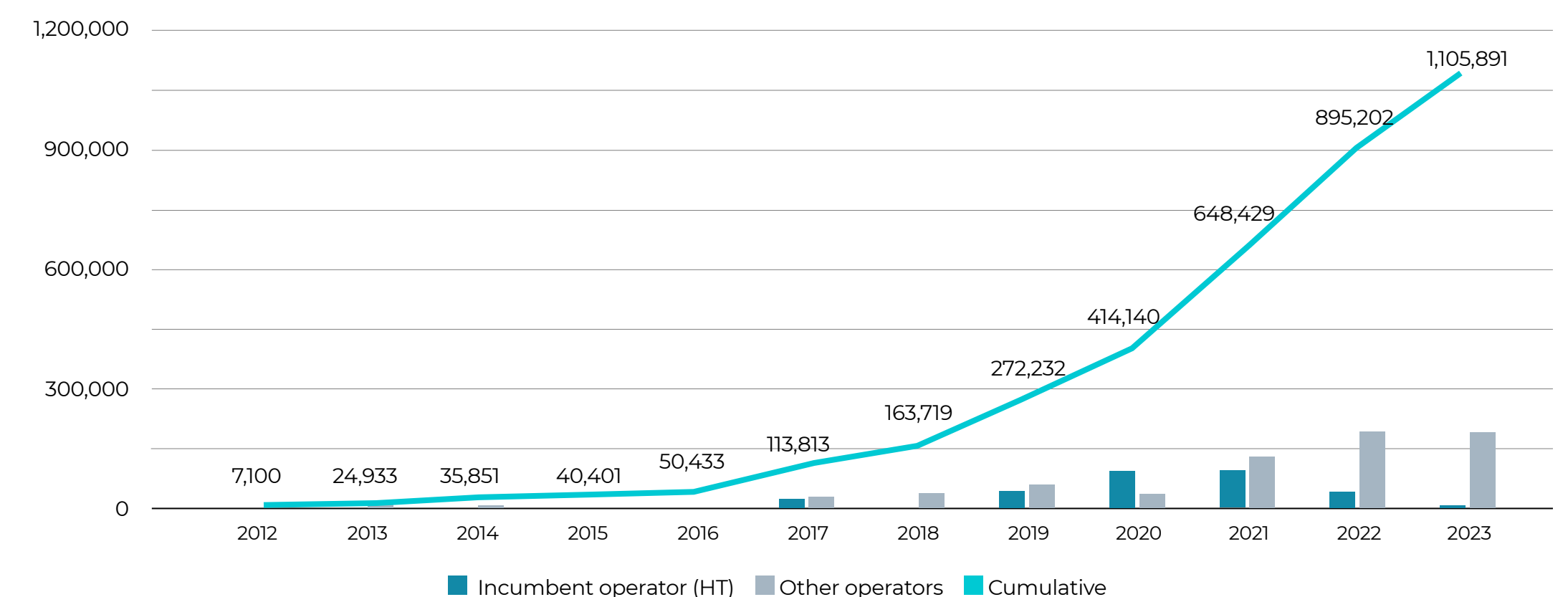
Type of the addressing and numbering space	Free numbers	Free numbers (%)
Services in the fixed network (all counties)	21,845,000	80.91 %
NetID codes	45	55%
060 General content services	991,758	99.18%
064 Services with child-inappropriate content	1,000,000	99.77%
072 Common access code services	988,049	98.80 %
074 Personal number services	997,394	99.74 %
075 Personal number services	987,312	98.73 %
800 Freephone service	805,188	80.52 %
890xx M2M services	47,300,000	47.30 %
9xxx Services in the mobile network (public mobile network access codes; NDC)	45,730,000	45.73 %

CONSTRUCTION OF THE ELECTRONIC COMMUNICATIONS INFRASTRUCTURE

Data and indicators on the development of the electronic communications market suggest a steady growth of demand for the broadband internet access service and the IPTV service. For electronic communications network operators and service providers to meet the growing demand and maintain service quality, network capacities and end-user access speeds should be increased, which requires major investments.

Data on the availability of broadband speeds show that the availability of high-speed networks is much higher in large cities, where operators' commercial interest is greater, than in rural areas. Data on the availability of broadband access are collected on a quarterly basis and aggregate results are published and presented on the HAKOM's GIS portal <http://mapiranje.hakom.hr/hr-HR/SirokopojasniPristup>. The portal also publishes the notices of intent to build optical fibre distribution networks, which operators are required to report in accordance with the [Ordinance on optical fibre distribution networks](#).

Figure 2.26 Number of users of optical fibre distribution networks – notices of intent to build



Cooperation with the State Geodetic Administration (SGA) and cadastre database

HAKOM and the SGA cooperate in setting up a single cadastre database of the electronic communications infrastructure (ECI) and associated facilities. In 2023, however, the preconditions for providing support to HAKOM's business processes were not met due to the partial verification of data submitted by infrastructure operators to the SGA, which are part of a single database ensuring access to spatial data on the constructed electronic communications infrastructure in the Republic of Croatia. Therefore, projects planned by HAKOM were postponed for a future period, after the database is completely verified (for the entire territory of the HR) by the SGA.

ACCESS TO AND THE USE OF THE ELECTRONIC COMMUNICATIONS INFRASTRUCTURE

The access to and the use of the ECI are important for the electronic communications market. The processes related to the common use of the ECI include the drafting of the subordinate legislation, regulations, instructions and forms for the access to and the shared use of cable ducts, the shared use of the physical infrastructure and optical fibre installations in buildings, collocation, resolving disputes between infrastructure operators and beneficiary operators, determining technical conditions, etc. The year 2023 saw the adoption of the [Ordinance on technical requirements for cable ducts](#) and the [Ordinance on the manner and conditions of access and shared use of electronic communications infrastructure and associated facilities](#). The Ordinance on technical requirements for cable ducts aligns regulations from the area of electronic communications with regulations on construction and physical planning. The Ordinance prescribes technical conditions for mini trenching/micro trenching, which provide for a swift execution and lower construction costs, reduce the damage to traffic and public areas as well as the environmental impact. The provisions of the Ordinance simplify and improve the construction process, creating a stimulating environment for investments in the development of broadband electronic communications networks. The Ordinance on the manner and conditions of access and shared use of electronic communications infrastructure and associated facilities prescribes a more efficient use of space in cable ducts. In view of the implemented activities and the regulation of conditions related to the use of the existing cable duct capacities, the new Ordinance repeals provisions on legalisation and amends provisions related to reimbursement. The Ordinance is supplemented by a chapter on the main conditions for the provision of collocation services pursuant to the provisions of the new [Electronic Communications Act](#) (ECI).

Right of way

Right of way is the right of access to and the installation, use, repair and maintenance of the electronic communications network and electronic communications infrastructure and associated facilities, including cable ducts, and other related rights, which impose a burden on the real estate on which the electronic communications infrastructure and associated facilities have been constructed. Based on the request of infrastructure operators, HAKOM issues right of way certificates. In addition, at the request of a public property owner or manager, the infrastructure operator of the ECI constructed on a public property or real estate owned by the HR and units of local and regional self-government and a real estate owned by other legal or natural persons is established, as well as the quantity and type of infrastructure and the amount of fee for the right of way. The right of way certificate is issued pursuant to the Electronic Communications Act and the [Ordinance on the right of way certificate and fee](#) based on requests submitted by infrastructure operators (infrastructure operators previously established at the request of public property managers or real estate owners).

In 2023, HAKOM received 308 requests to issue the right of way certificates from natural persons, 97 requests of infrastructure operators for the existing ECI and 15 requests for the new ECI. A total of 396 certificates were issued and 3 decisions on refusing the requests of infrastructure operators for the new ECI. The total length of the route for which the right of way certificates were issued is 292,750.12 metres. As regards the regulation of property-law relations between infrastructure operators and public property managers or real estate owners, 11 new requests were received in 2023 for the regulation of these relations between local self-government units (LSUs) and infrastructure operators in the Cities of Belišće, Valpovo, Samobor (4Tel Telekomunikacije d.o.o.), Opuzen and Senj and in the following communities: Podstrana (fifth supplementary request), Viškovo (HT and Telemach Hrvatska), Omišalj, Sveti Petar u Šumi; a revision of the Study for the right of way for the County Road Administration (CRA) of the Varaždin County (supplement-revision-part VI). A total of 21 requests filed by LSUs and CRAs were addressed, i.e., an infrastructure operator was identified in the LSU administrative area and the CRA area. These included 11 requests received in 2023 and 10 requests from the previous period. It should be noted that HAKOM's resolution of requests is conditioned on the accuracy of the documentation, so that it is possible to have several decisions (partial, final and supplementary) related to the same case. In this manner LSUs and CRAs regulate property law relations with infrastructure operators that have illegally set up the ECI on the real estate in their ownership. The objective of regulating these relations is to achieve monetary compensation for the use of real estate.

Table 2.4 Number of LSU and CRA requests for the regulation of property-law relations by year

Year	2015	2016	2017	2018	2019	2020	2021	2022	2023
Number of requests	175	140	49	93	87	47	51	21	11

PUBLIC AUTHORITY OPERATIONS

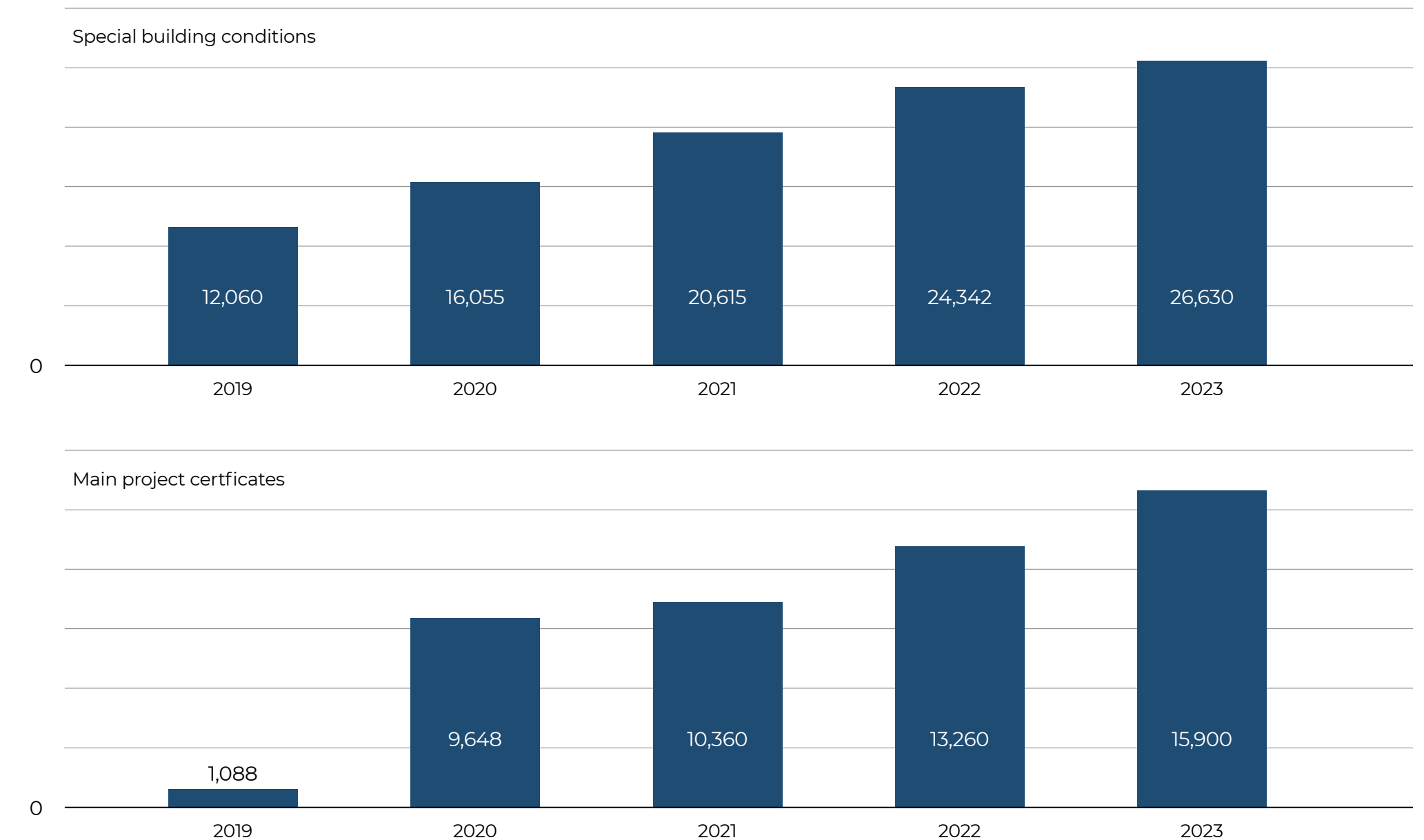
HAKOM, as a public authority competent for activities prescribed by statutory regulations on physical planning and construction, participates in the procedures of issuing guidelines for preparing physical plans, providing opinions on physical planning documents, establishing special conditions for construction and granting main project certificates.

Issuing requests (guidelines) for preparing physical plans and providing opinions on physical planning documents

HAKOM participates in the procedure of adopting physical planning documents that serve as a basis for the seamless construction of the ECI and associated facilities. Pursuant to the [Physical Planning Act](#) HAKOM, as a public authority, regularly participates in the adoption of physical plans by issuing guidelines and opinions, which define the manner of network planning while not restricting their development, taking care that requirements for the protection of public health, space and environment are met. In 2023, HAKOM issued 498 documents with requests (guidelines) to be complied with during the development of physical plans at all levels. During the year, HAKOM participated in public consultations considering proposals for physical plans at all levels, issuing 431 opinions concerning proposed physical plans.

Defining special building conditions and issuing main project certificates

For interventions into space, within the zone of the ECI and other associated facilities as well as in the safety zones and the radio corridors of certain radio stations, HAKOM, in compliance with the [Physical Planning Act](#) and [Building Act](#), establishes special building conditions and issues certificates for the main projects. In 2023, the number of requests for establishing special building conditions and requests for certificates for the main projects increased.

Figure 2.27 Number of defined special building conditions and issued main project certificates

By digitalising the process, HAKOM improved access to the [e-Licences](#) system and the [e-Conference](#) module of the Ministry of Physical Planning, Construction and State Assets, which significantly shortened time limits and ensured transparency and cost saving in the process of defining special building conditions and issuing main project certificates.

Broadband Ready label

In 2023, HAKOM participated in developing the HR's position on the proposal of the Gigabit Infrastructure Act. As the Act includes provisions on the physical in-building infrastructure and the obtaining of the Broadband Ready label, once the Act comes into force, HAKOM will define the form and size of the label as well as the manner and conditions of awarding it.

OVERVIEW OF REGULATORY MEASURES

In 2023, key regulatory activities included decisions on the analyses of the market for wholesale local access provided at a fixed location (M1/2020) and the market for wholesale central access provided at a fixed location for mass-market products (M3b/2014). These two markets are important for providing the broadband internet access service at the retail level. Building on the analyses, HAKOM adopted regulatory decisions to establish a new, or rather, different approach to market regulation. HAKOM carried out the first segmentation by technology and conducted a detailed geographic market analysis, concluding that in certain areas it was no longer justified to regulate HT for VHCN services.

HAKOM updated the cost model for the calculation of regulated wholesale services, so that new prices for the following three-year period were calculated.

Also designed was the cost model to verify the possibility of economic replication of VHCNs, a necessary tool for determining obligations related to symmetric regulation, applicable to all operators, irrespective of the established SMP status.

Analyses of relevant markets

[Decisions](#) on the analyses of **the market for wholesale local access provided at a fixed location (M1/2020) and the market for wholesale central access provided at a fixed location for mass-market products (M3b/2014)** were adopted in July 2023. These two wholesale markets are related to the provision of the retail broadband internet access service and other electronic communications services, such as the IPTV service and telephone service in the fixed network. These analyses resulted in the adoption of a different approach to market regulation, aimed at achieving the strategic objectives of HAKOM and the HR, such as promoting investments in VHCNs and developing market competition, to bring the greatest benefits to end-users and the economy.

In these analyses, HAKOM for the first time carried out a segmentation of market by technology, that is, divided the market into the low capacity market and the high capacity market. The low capacity market comprises the services of broadband access via the copper network, broadband access at a fixed location via mobile networks and fixed broadband wireless access. The high capacity market comprises services provided via optical fibre and cable networks (VHCNs).

In addition to segmenting the market by technology, HAKOM, also for the first time, conducted a detailed geographic analysis of the market at the level of local self-government units (city/com-

munity/districts of the City of Zagreb), assessing the level of market competition in 572 separate geographical units, according to selected criteria. Specifically, market competition exhibits large differences across geographic areas in the high capacity market, as both HT and other operators build VHCNs, but not equally in all geographic areas. Based on this analysis, the geographic segmentation of the high capacity market was established and the market was divided into competitive and non-competitive areas.

Consequently, it was for the first time decided that certain areas in the high capacity market in the Republic of Croatia did not require prior regulation, with the result that HT's regulatory obligations valid up to then were repealed. These competitive areas include 72 geographic units (13 percent), home to about 37 percent of the total population, i.e., approximately 1.43 million inhabitants. The repeal of regulatory obligations in these areas is expected to have a positive impact on market competition, contributing to the benefit of end-users and boosting investments. In the remaining (non-competitive) areas, certain regulatory obligations continued to be imposed on HT, as a regulator with significant market power.

The small capacity market, which is predominately composed of services provided via the copper network, did not have to be analysed, as only HT, the incumbent operator, has a copper network, while building copper networks is not cost-effective for other operators. As a result, there are no geographic differences in market competition across different areas in the Republic of Croatia. This market thus remained within the national limits and continued to be regulated.

In these market analyses, HT was imposed an obligation to introduce the Equivalence of Input (EoI) model in the non-competitive areas of the high capacity market. The aim of the EoI measure is for HT's retail services to use the same systems and processes as the operators using wholesale services so that a high degree of non-discrimination can be achieved. In late September 2023, HT submitted a proposal for the implementation of the EoI, which HAKOM analysed in cooperation with HT and other operators. Based on operators' proposals and comments, a proposal for a public consultation regarding the details of the implementation of this obligation will be prepared. HT and its retail unit, Iskon, are obligated to conduct a margin squeeze test for the broadband internet access service and the closely related IPTV service. The test is carried out in accordance with the Margin squeeze test methodology, adopted by HAKOM. As it was established that HT's market position in the high capacity market – non-competitive areas was not as strong as in the low capacity market, a procedure to amend this methodology was initiated, in order to bring the method and conditions of conducting the margin squeeze test into compliance with the conclusions derived from the market analyses.

In June 2023, [decisions](#) were adopted on the conducted three criteria test in **the market for wholesale voice call termination on individual mobile networks (M2/2014)** and **the market**

for wholesale call termination on individual public telephone networks provided at a fixed location (M1/2014). It was concluded that there were no large and permanent obstacles to market entry, that the market structure favoured the development of efficient market competition and that the application of relevant regulations sufficed for the elimination of potential market weaknesses. Consequently, both markets were deregulated and all operators' regulatory obligations were repealed. Over the years of the regulation of fixed and mobile voice call termination markets, excessive termination rates have seriously threatened effective market competition, because operators, being monopolists in their own networks, have been free to set call termination rates above the level enabling effective market competition. However, Commission Delegated Regulation [\(EU\) 2021/654](#) of 18 December 2020 set single maximum Union-wide voice termination rates for mobile and fixed networks. Therefore, in the conditions of deregulation, operators can no longer increase wholesale voice call termination rates, which was the main negative outcome in the case of the lack of market competition in these markets.

In April 2023, a public call was launched to collect information and views from interested parties for the purpose of defining and analysing the relevant **markets for wholesale dedicated capacity (M2/2020)** and **the market for wholesale trunk segments of leased lines – non-competitive relations (M14/2003)**, currently regulated pursuant to decisions adopted in 2020. In the second half of the year, HAKOM implemented activities related to the collection and processing of data from the market. The analysis of the markets for wholesale dedicated capacity also requires a detailed geographical analysis to establish whether the whole area of the HR has equal competitive conditions or the markets should be geographically segmented and regulations in specific geographic areas adjusted accordingly. Given the complexity and the specific nature of services provided in this market and data available to operators, the geographical analysis of these markets and the assessment of competitive conditions required more time than planned, so that a related public consultation will be held in 2024.

Cost models and wholesale prices

The regulatory obligations imposed on HT, as a regulator with significant market power, include the obligation of access to various wholesale products/services. Other operators provide their services to end-users via these wholesale services, such as the bitstream service, FA-PON service, LLU service, DTK service and high-quality access service. In order to create conditions for efficient market competition, it is important that the prices of the mentioned wholesale services be cost-oriented.

The prices of regulated wholesale services currently in effect were calculated based on the results of the BU-LRIC+ cost model, designed in February 2021. Since then, there have been many

changes that have made an impact on the assumed input parameters of the cost model, which has a significant influence on the costs of regulated wholesale services. In 2023, HAKOM launched **a project of updating the input values of cost model parameters**, with a view of setting the prices of regulated wholesale services for upcoming periods. The following input parameters of the cost model were updated: demand for services and demand distribution, network coverage, the unit costs of network resources for service provision, non-network general costs, fully amortised assets, other input parameters for network dimensioning and WACC values.

The updated cost model served as a basis for the calculation of **the wholesale prices** of regulated services, with a public consultation on the amount of monthly fees for wholesale regulated services launched in late 2023. New monthly fees will come into effect in the second quarter of 2024 and will be applicable in the following three years to ensure regulatory predictability.

In addition to monthly fees, efficient market competition also necessitates defining the amounts of **one-off fees** for activities related to wholesale services in such a manner that only justified costs are reimbursed. HAKOM initiated the procedure of amending one-off fees so as to update the work-hour cost for the employees that perform the activities included in their calculation. In December 2023, HAKOM initiated a public consultation on the amount of one-off fees and in March 2024 it notified the European Commission of the proposal. New fees are to be applied as of June 2024 and remain valid for a three-year period.

December 2023 saw the adoption of the [decision](#) setting the weighted average cost of capital (WACC) rate for services provided in the public communications network pursuant to which the WACC rate was increased by an additional risk premium for FTTH/FTTB/FTTDP services. Based on the updates of all parameters, HAKOM calculated the WACC for the public communications network in the amount of 4.82 percent. The additional risk premium for FTTH/FTTB of 1.59 percent was obtained by the comparable values method based on available data collected by BEREC. The updated WACC will be applied in all new or amended decisions on regulated wholesale services prices.

Symmetric regulation

With the new ECI having come into force, HAKOM now has new options for the application of provisions on symmetric regulation, which applies to all operators, irrespective of the established SMP status, and concerns the regulation of access to installations within buildings or up to the first concentration point, which HAKOM can extend to a point beyond the first concentration or distribution point. Consequently, in 2023 HAKOM, in cooperation with Axon Partners Group

Consulting S.L.U. (AXON), designed a cost model to verify the possibility of economic replication of VHCNs, in accordance with Article 93 of the ECI, taking into account BEREC Guidelines on the Criteria for a Consistent Application of Article 61(3) of the EECC. This tool enables the assessment of economic replication at a single VHCN access point, which is necessary to determine whether access obligations should be imposed to a point beyond the first concentration or distribution point.

Other regulatory activities

Under the Framework National Programme (FNP), HAKOM issues opinions on wholesale conditions and network access fees that are co-financed from EU funds and once a year carries out the subsequent verification of wholesale fees and conditions. Namely, the FNP envisages the development of the next generation broadband access (NGA) infrastructure in the areas where there is no sufficient commercial interest for investments from operators and service providers in the market. Therefore, it is justified to co-finance the broadband infrastructure construction by public funds, that is, by state aid. Pursuant to the provisions of the FNP, the operator of the network built on state aid is required to propose fees and conditions for the wholesale access in accordance with the rules specified in the FNP. As part of this requirement, the network operator is obligated to submit to HAKOM a proposal of access fees and conditions, including a detailed description of the methods and/or benchmark values applied when drafting the proposal. HAKOM then gives its opinion on the proposed fees and conditions. Following the initial approval, wholesale fees and conditions must subsequently be regularly verified in each project to encompass all changes in the market, primarily regarding amendments to wholesale fees and conditions in commercial areas, including amendments to the regulated fees and conditions of SMP operators. The subsequent verification procedure must be carried out at least once a year, with the year starting at the moment wholesale fees and conditions are initially approved. The table below shows the projects for which HAKOM issued opinions in 2023.

Table 2.5 Projects within the FNP for which HAKOM issued opinions on conditions and fees

Network operator	Type of access network	Area covered	Verification	Opinion issued
Hrvatski Telekom d.d.	wireless	Osijek-Baranja County, Brod-Posavina County, the Cities of Rovinj, Poreč, Zaprrešić, Dubrovnik, Mursko Središće, Sveta Nedelja, Vukovar, Ludbreg and Omiš and Municipalities Đurmanec and Medulin	initial	February 2023
Tesla net d.o.o.	optical fibre	Cities of Gospić and Otočac and Municipality Plitvička jezera	initial	June 2023
Kotar net d.o.o.	optical fibre	Municipalities Sukošan, Sveti Filip i Jakov, Galovac and Škabrnja	initial	June 2023
AI Hrvatska d.o.o.	wireless, optical fibre	Cities of Solin, Kaštela and Ivanić Grad	subsequent	July 2023
Smart Island Krk d.o.o.	optical fibre	Island of Krk	initial	September 2023

In order for HAKOM to be able to give its opinion on the proposed fees, the fee amount is checked once a year using the benchmarking method in relation to the same or comparable services offered in other areas in the Republic of Croatia, where operators operate under regular market conditions, including services provided by SMP operators the prices of which are set under HAKOM's regulatory measures.

In 2023, a [decision](#) was adopted in the procedure of amending the reference offer of Hrvatski Telekom (HT) for the wholesale high-quality access service, initiated at the request of HT in connection with regulatory disputes in 2022 concerning the use of the data centre connectivity wholesale service. Specifically, HT requested that the prices of the data centre connectivity service be amended, stating that the decision on prices in the wholesale high-quality access market considerably reduced the price of the data centre connectivity service, without ensuring the coverage of costs because the foreseen demand and quantity in the bottom up cost model did not correspond to actual demand. HAKOM assessed that such an increase in demand for the data centre connectivity service relative to other high-quality access services caused HT not to be fairly compensated for actual costs, which was not in line with the regulatory obligation of cost orientation of wholesale prices and could lead to distortions in the market. Due to the aforesaid, HAKOM initiated the procedure of amending the reference offer and adopted an interim decision pursuant to which, until the end of the proceedings, no new contracts for the data centre

connectivity service from the reference offer for the wholesale high-quality access service was to be made. In addition, pursuant to an interim decision of April 2023, HT was ordered to stop providing the Hybrid Cloud retail service because it could not be replicated via HT's wholesale services.

Pursuant to a [decision](#) adopted in July 2023, HT was ordered to terminate the data centre connectivity service and to define, before resuming the provision of the Hybrid Cloud service, the conditions for the use of the new wholesale service that will enable its technical and economic replication.

Pursuant to its decision of May 2023, in line with the procedure prescribed in the applicable market analyses, HAKOM enabled a portion of the access copper network to be switched off at the Koljane location. This was a faraway and isolated location, with the facilities hosting the HT's equipment in poor condition, so that the costs of their repair and maintenance would considerably exceed the revenues generated by the provision of services at this location. The location of Koljane did not cater for wholesale users and two active retail users of the voice service were offered a substitute via the mobile communications network, providing the service quality equal to or higher than the one that could be achieved via the existing copper network, at no extra cost and without any change of the conditions for end-users.

At the end of December 2020, the European Commission adopted Delegated Regulation setting a single maximum EU-wide mobile voice termination rate (MTR) and fixed voice termination rate (FTR). In relation to the FTR, as of 1 January 2022, the single EU-wide rate is in force, equal for all EU operators, amounting to 0.07 euro cent/min. The single MTR rate, which was 0.4 euro cent/min in 2023, as of 1 January 2024 stands at 0.2 euro cent/min. In September 2023, in cooperation with AXON consultancy, the European Commission launched a project on the update of the cost model for wholesale roaming rates and wholesale mobile voice termination rates. The project envisages an active role of regulatory authorities in all of its phases, which involves defining the methodology for the design of the model, data collection and validation as well as the review of the completed model. The project is planned to be completed by July 2024 and decisions on new rates to be adopted by the end of 2024.

The implementation of all obligations under Roaming Regulation continued to be monitored on a regular basis by collecting and analysing market data. BEREC is entrusted with the task of monitoring the implementation of the Joint Statement agreed between EEA⁶ and Ukraine operators with a view of reducing wholesale roaming prices. HAKOM is included in the collection of data and the submission of data to BEREC and the European Commission.

⁶ EEA – European Economic Area – the entire territory of the EU and Iceland, Liechtenstein and Norway

INSPECTION ACTIVITIES

Inspection supervisions were in 2023 conducted in line with the principles of proportionality and appropriateness and in accordance with HAKOM's strategic objectives for the 2022 to 2025 period. The areas of focus were primarily established in the 2023 Annual Work Programme, which defined inspection activities. The principle of proportionality ensured that the measures taken in the course of inspection activities were attuned to the nature and seriousness of regulatory deviations, taking into account the complexity and abundance of regulations and rules that entities in the market were required to comply with. The principle of appropriateness guaranteed that the measures implemented by HAKOM were focused on the elimination of the persistent problems adversely affecting market competition and end-users' rights. If observed by electronic communications areas, supervision focused on ensuring the high quality and accessibility of services to users, efficient user protection, transparent and efficient market competition and the compliance of all market stakeholders with the regulatory framework and the security and integrity of networks and services.

Users: there were 55 inspection supervisions, carried out over 34 operators and focusing on the following: service provision transparency (informing users on prices, conditions, rights and obligations as well as rules on concluding remote contracts and concluding contracts outside business premises), the availability of high-quality services (access to universal services and compliance with the standards of service quality, safety and reliability), monitoring and measuring service quality (verifying the system of calculating and charging for services as well as controlling the system of measuring and reporting on service quality) and the streamlined selection and change of contracted services (verifying number porting and operator switching procedures and controlling the points of sale and customer support services). Inspection supervisions established 5 irregularities, connected with unsolicited electronic communications, non-compliance with malfunction repair rules, failure to act upon user complaints, the actions of customer support services when remote contracts were concluded and the provision of incomplete and inaccurate information to users.

Electronic communications services: 37 inspection supervisions were carried out over 7 operators. The inspection supervisions established 14 irregularities: 4 concerned delays and disruptions in service provision due to operator switching, 6 concerned untimely number porting and related fees paid by operators pursuant to inspector decisions and 4 were related to decisions made after the review of security of operators' networks and services, which were ordered to eliminate all established irregularities.

Regulatory obligations: 4 inspection supervisions over HT were conducted, with a focus on the supervision of rates and the cost accounting, non-discrimination and transparency as well as the misuse of significant market power. Two irregularities were detected and eliminated during these inspection supervisions. One decision on the elimination of discriminatory irregularities was issued to HT, regarding the provision of the service of data centre connectivity and 1 decision regarded the violation of regulatory obligations in the market for wholesale local access provided at a fixed location and the violation of the margin squeeze test.

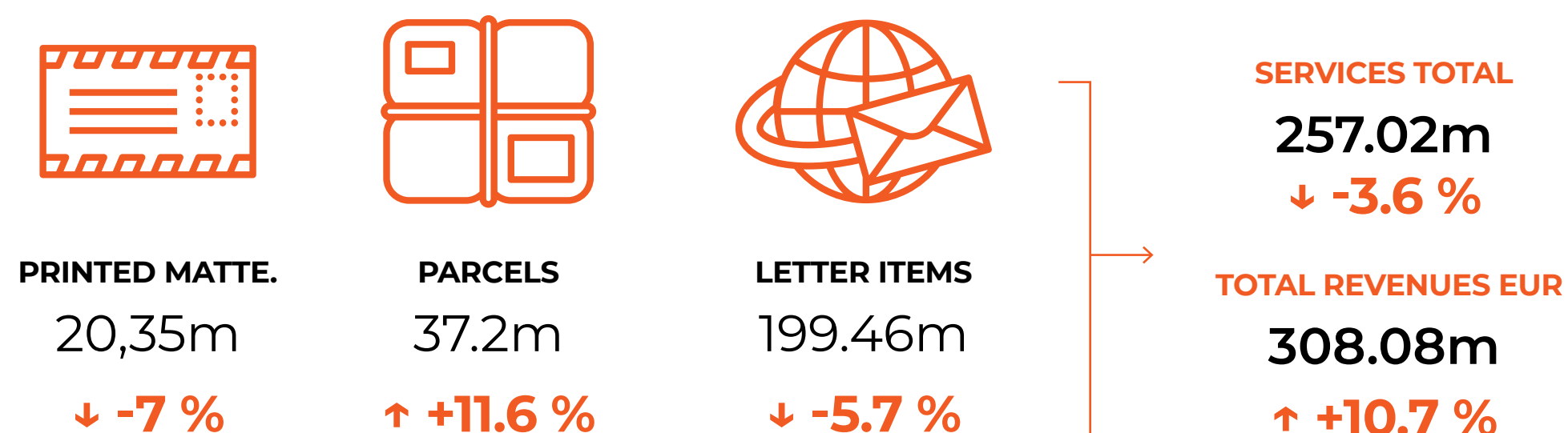
ECI: there were 22 inspection supervisions, conducted over 3 electronic communications operators. Inspection supervisions dealt with the regulatory framework for the construction and deployment of the ECI and VHCNs, the maintenance and construction of the ECI and new associated facilities, the database on the ECI and associated facilities, filming and recording of the ECI and associated facilities, symmetric obligations related to the access to and the use of the ECI and associated facilities, universal service, service provision quality and the reference offer for the ECI. Inspection supervisions established 4 irregularities, which were eliminated. All inspection supervision decisions were published on [HAKOM'S website](#).



03

**POSTAL
SERVICES**

Figure 3.1 Basic data on postal services market



Even in today's digital age postal services have an important role in maintaining global connectivity by enabling an efficient distribution of letters, parcels and goods across the world, while modernised postal services provide support to e-commerce, thus contributing to the economic development, social and economic inclusion. In 2023, activities were primarily directed at the development of the postal services market and the preservation of the universal service in the HR, so through its regulatory activities HAKOM, in line with the EU's objectives, strove to implement European practices and guidelines. Possible amendments or rather the adoption of the new Postal Services Directive are currently deliberated at the EU level. International developments and policies implemented by the EU are described in more detail in Chapter 7, within the framework of international cooperation.

MARKET OVERVIEW

As in the previous periods, the postal services market in 2023 was greatly influenced by continued digitalisation of the society and changes in consumer habits of postal services users. Thus, it came to the replacement of the traditional means of communication with electronic communication on one hand and the growth in demand for physical services relating to e-commerce on the other, which has been altering the structure of realised services. Consequently, both the so-called traditional and other postal services are under constant pressure for change, which results in more innovative services being offered, tailored to the needs of users, and in the introduction of new business models providing postal services. In line with the developments in the postal markets of EU Member States, the HR also registered a decline in the total number

of postal services. The greatest influence on the overall smaller number of postal services came from the declining numbers of letters and postal matter. At the same time, the number of parcels rose, continuing the positive trends observed in the past several years. A record number of parcels was registered in 2023, which increased their market share. However, this growth could not compensate for the shortfalls in other types of realised postal services.

According to expectations, following several years of operating in an unstable environment, cross-border postal traffic has slowly been returning to its normal flows. In 2023, the number of services in international traffic increased, thus halting the negative trend, primarily because of the increase in the volume of e-commerce as the greatest generator of postal services in international traffic.

These postal market trends are expected to continue going forward: the letter segment of the market is expected to decline paired with the parallel growth in the parcel segment, accompanied by the increase in revenues. This will require providers to adjust to the demands of the market and the needs of users, especially in the segment connected with e-commerce wherein lies the greatest potential for growth and development.

Providers in the postal services market

There were 24 postal service providers at the end of 2003 – the same as in the year before. However, it is necessary to stress that there were certain changes since two new business entities submitted applications to provide other postal services, while two providers ceased to provide postal services, of which one was the provider of interchangeable services and the other of other postal services. The emergence of new providers indicates that there is still room in the market for companies, which through their innovative services may spur demand and increase competition. Pursuant to the Postal Services Act (PSA), the only provider having the right and the obligation to provide the universal postal service in the HR for the period of 15 years is HP. By analysing the situation in the market, HAKOM established that there is currently no other provider apart from HP that could provide the universal service. In addition to the universal service, HP also provides interchangeable and other postal services and is the largest provider in the HR. Through its network of postal offices HP also provides non-postal services (financial services, sale of goods, etc.), the provision of which in certain areas (islands, less densely populated areas, etc.) has a considerable impact on people's lives.

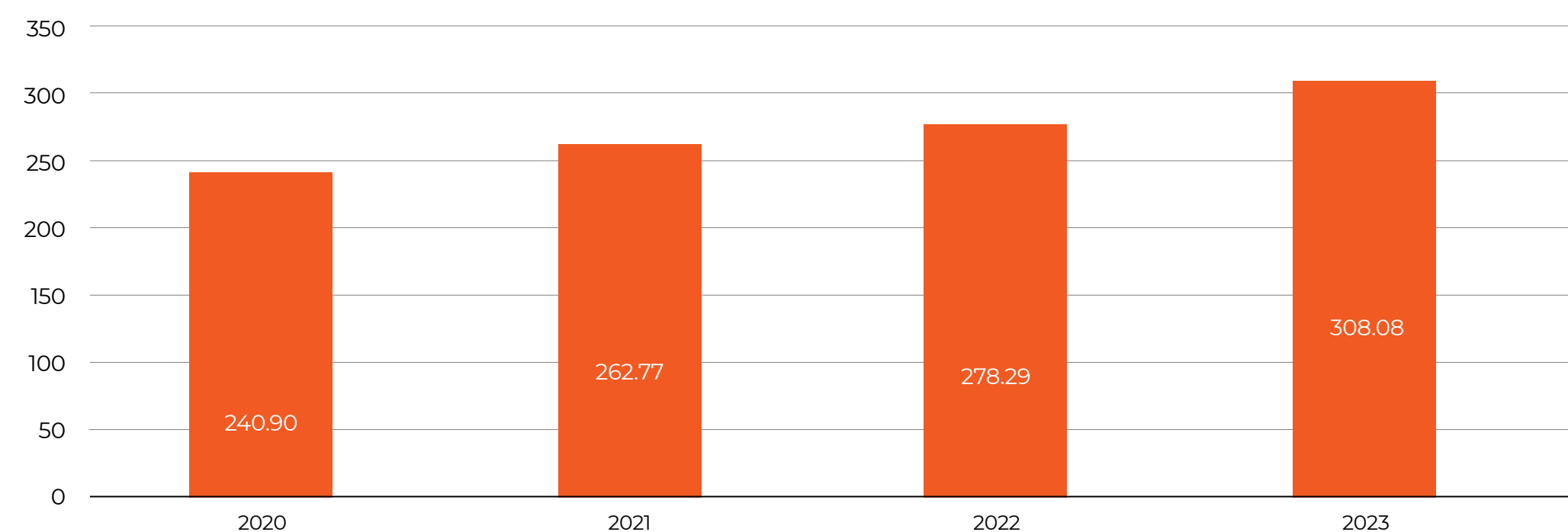
As for other registered providers, the greatest number provide other postal services (19), three also provide interchangeable services, while four provide only interchangeable postal services.

In the postal market of the HR, postal services are also provided, through their own networks as registered providers or in partnerships with other providers in the HR, by companies, that operate in the global and/or regional postal markets (DHL, DPD, FedEx, UPS, GLS, Intereuropa, etc.). Ten providers are registered to provide services in domestic traffic, among which three provided their services in the limited area of one or more Croatian counties and/or cities, while other 14 providers provide services in both the domestic and international traffic. At the end of 2023, there were 11,622 workers employed to provide postal services or some 1 percent less than at the end of 2022. New access points, where users can claim or submit their postal items, continued to be introduced in 2023, whereby service providers strove to rationalise their operations and improve the quality of delivery. This was especially evident from the increase in the number of parcel delivery lockers⁷, of which there were 1,234 at the end of 2023 or 192 percent more than at the end of 2022. The number of available facilities of other business entities (shops, gas stations, etc.) increased as well.

Revenues from the provision of postal services

The revenues from the provision of postal services grew further in 2023, continuing the positive trends from the previous years despite the overall decline in the number of services. The reason for this is in the higher number of parcels and connected value added services (higher-value services), which also generated higher revenues, while the revenues from the smaller number of delivered letters were for the most part compensated by the increase in the prices of these services. Revenues totalled EUR 308.1m, up EUR 29.8m from the year before, which was a rise of 10.7 percent.

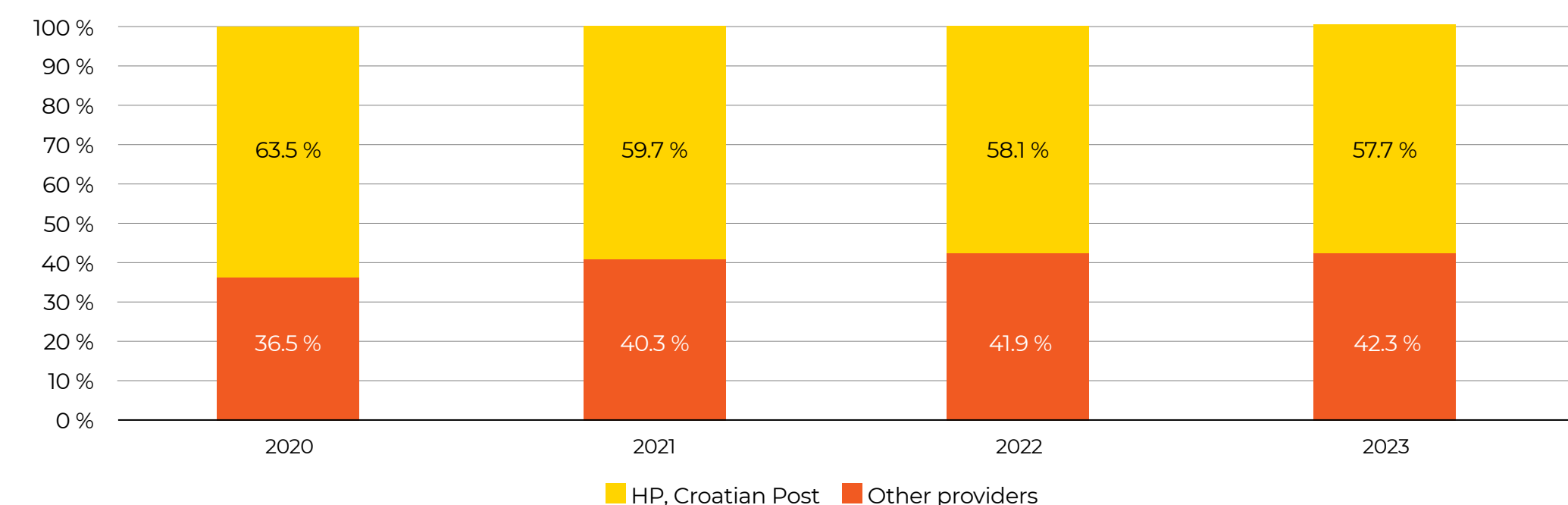
Figure 3.2 Total revenues from postal services (in EUR million)



⁷ Automated devices for the submission and delivery of postal items.

Both HP and other providers increased their revenues from the previous year. HP increased its revenues by some 10 percent and other providers increased theirs by some 12 percent. Other providers increased their market shares, continuing the trends from the previous years.

Figure 3.3 Providers' shares in total revenues



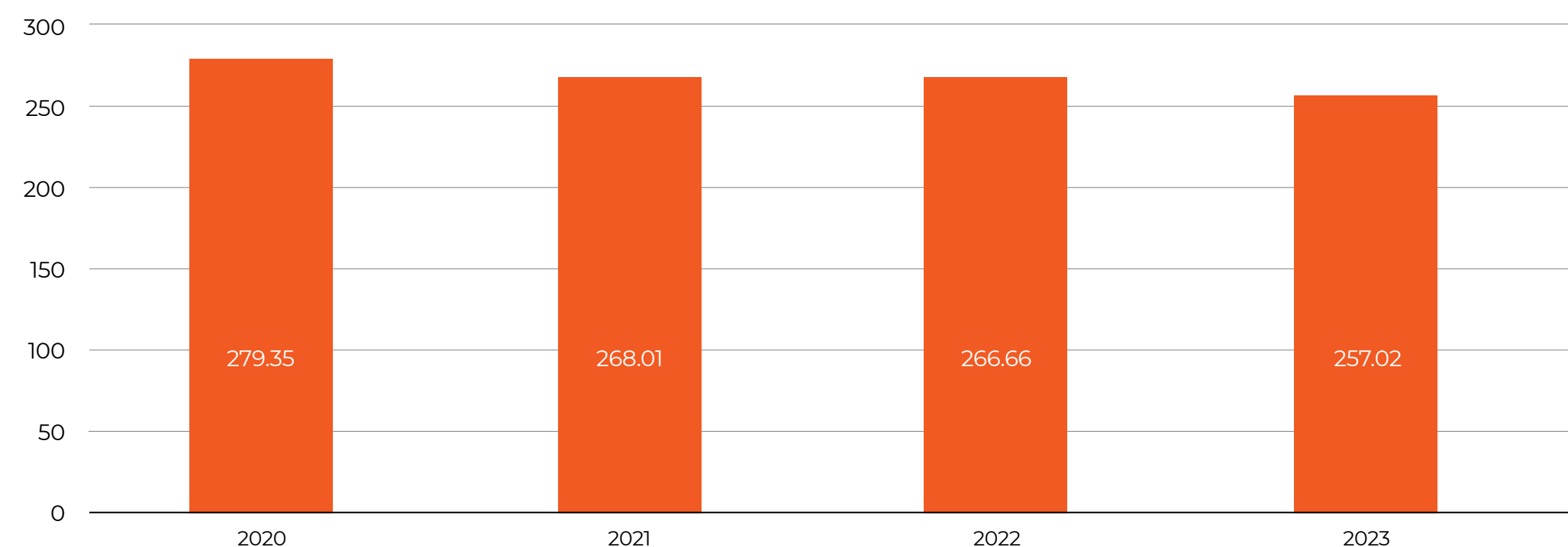
According to the structure of realised revenues, it is evident that HP continues to derive the largest share of its revenues (some 60 percent) from within the framework of the universal service by providing “traditional” postal services, which have been decreasing year after year. Other providers derive the bulk of their revenues from the provision of higher-value services within the framework of other postal services, which grew uninterruptedly. In 2023, revenues from the provision of higher-value services, as over several previous years, outstripped revenues from the provision of “traditional services”. However, the increase in the price of the share of services from the scope of the universal service halted the difference in their shares, which remained unchanged from the year before. As for the upcoming period, the share of higher-value services is expected to increase due to the forecasted growth of e-commerce and the decline in revenues from the letter segment of the market.

POSTAL SERVICES

The overall number of postal services has been decreasing for several years now. A total of 257,019,937 postal services was realised in 2023, down 3.6 percent from the previous year, so that the postal market in the HR falls in line with the trends observed in other markets of EU Member

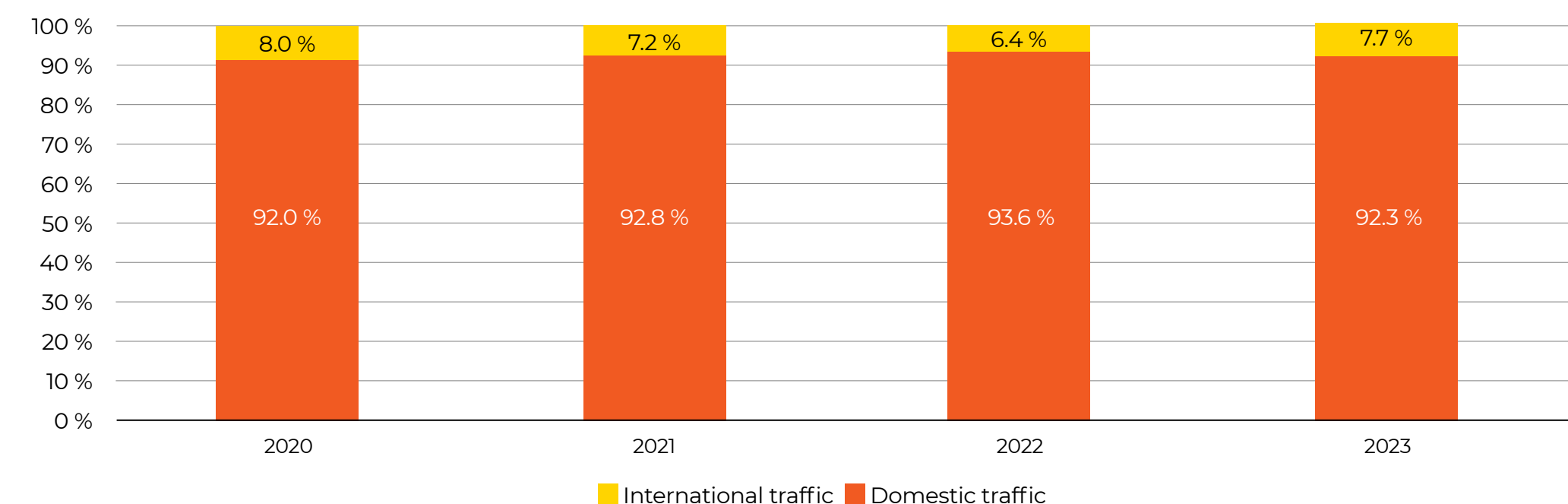
States. Namely, the increasing influence of the digitalisation of the society with postal communication being replaced by more modern means of communication affects the number of postal services, that is, reduces them. It is expected that this trend will be even more prominent in the years to come.

Figure 3.4 Total number of postal services (in million)



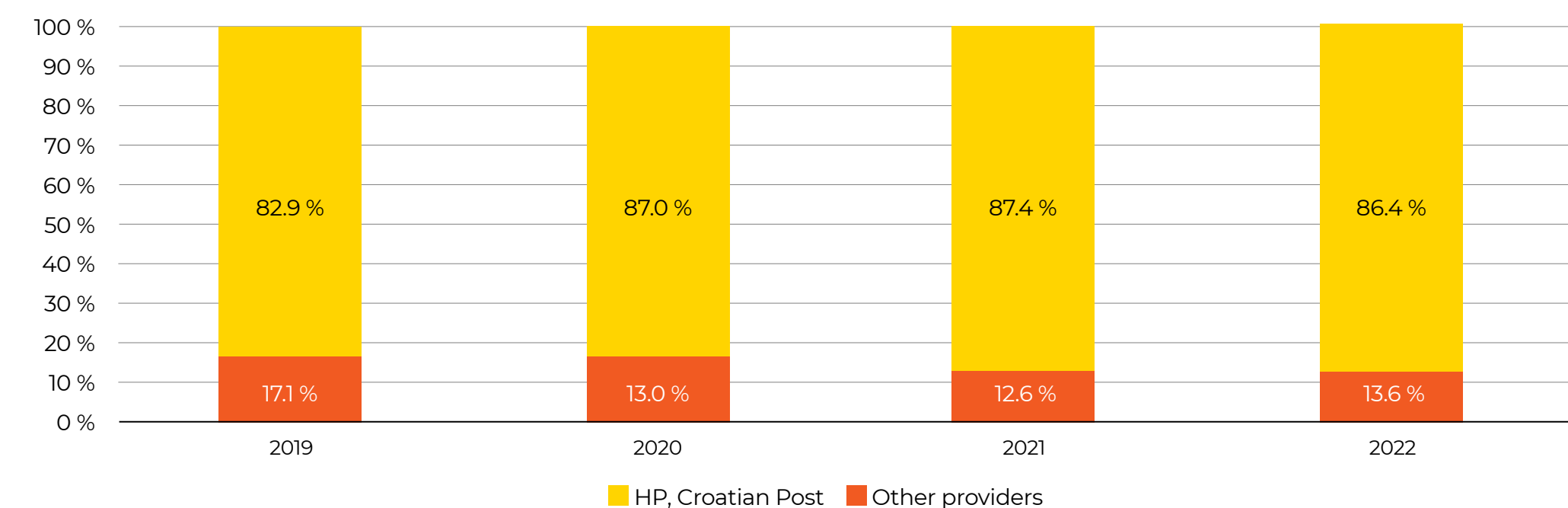
In line with expectations, after being faced with an unfavourable environment the international postal traffic slowly returned to its “normal” flows in 2023. The number of services in international traffic increased and the negative trend from the previous years was halted. There was a total of 19.7 million cross-border services realised in 2023, some 2.5 million more than the year before, which was a rise of some 15 percent. The increase also affected the share of international traffic in total traffic and halted the negative trend. In 2023, the share of international traffic was 7.7 percent, still far removed from the years when its share accounted for some 11 percent. Positive trends are expected to continue, primarily due to the increase in the volume of cross-border e-commerce as the greatest generator of international postal services.

Figure 3.5 Shares of postal services by types of traffic



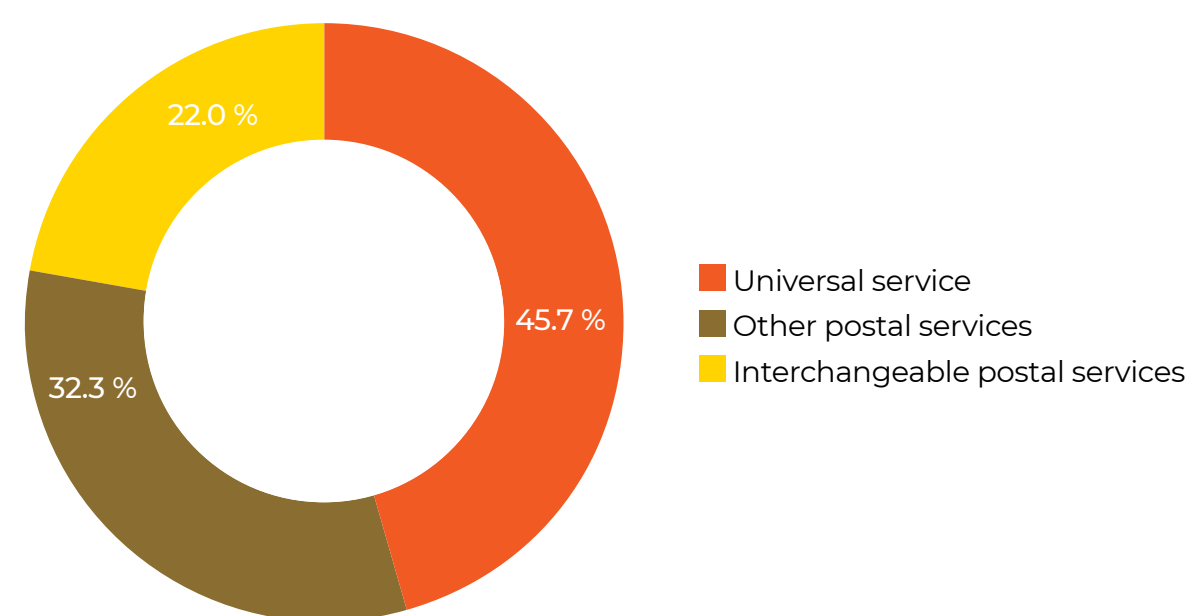
By the number of services provided, HP continued to be the largest provider of postal services in the market with a total of 222.1 million services accounting for a share of 86.4 percent, one percent down from the previous year. In contrast to the market share by services provided, HP’s dominance by realised revenues is not as strong, its share totalling some 58 percent.

Figure 3.6 Provider market shares by number of provided services



Relative to 2022, HP reduced the number of its services by 4.7 percent, while other providers increased theirs by 4.1 percent. A review of the types of services indicates a continued fall in the share of the universal service in total services. In 2023, the share of the universal service continued to be the highest, 45.7 percent, but still 4.7 percent below the share in the previous year and some 16 percent below the pre-pandemic 2019 because traditional services from the scope of the universal service were hit the hardest during the period. The number and the share of interchangeable and other postal services increased as well, so the share of other services at the end of 2023 was 32.3 percent, and of interchangeable services 22 percent.

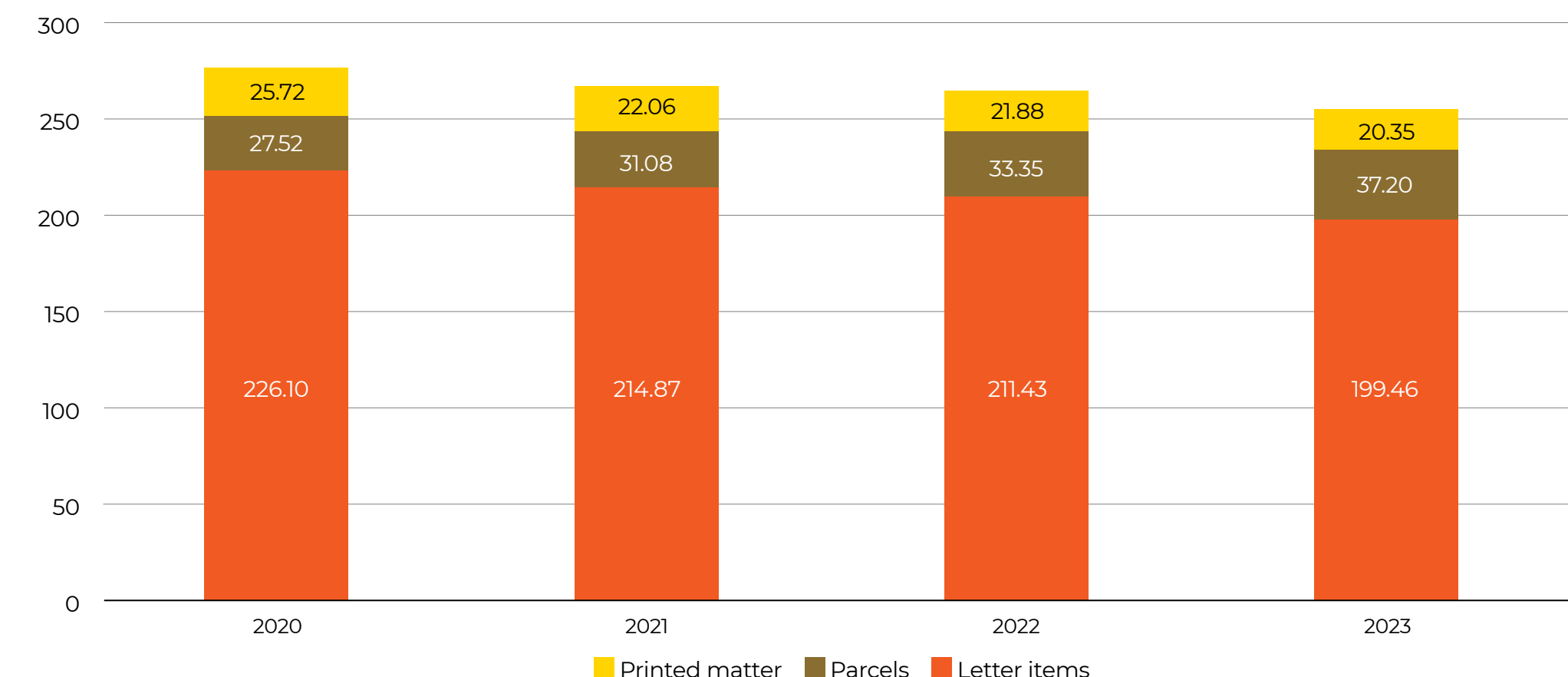
Figure 3.7 Shares of types of postal services



The environment in which postal services were provided in the past few years had a great influence on the demand for individual types of services. The number of letters and printed matter thus continued to decline, while the number of parcels grew. This was in line with trends in the markets of other EU Member States, so the market in the HR followed developments in the single European market. A total of 12 million less letters⁸ was delivered in 2023 than the year before. There were 5.7 percent less letters than in the previous year and 7 percent less printed matter. Cumulatively, in the period from 2020 to 2023, the number of letters declined by 11.8 percent and the number of printed matter by 20.9 percent. In contrast, parcel delivery grew, with the number of parcels rising by some 4 million from the year before, which is an increase of 11.6 percent in a one year period and 35.2 percent in a four-year period.

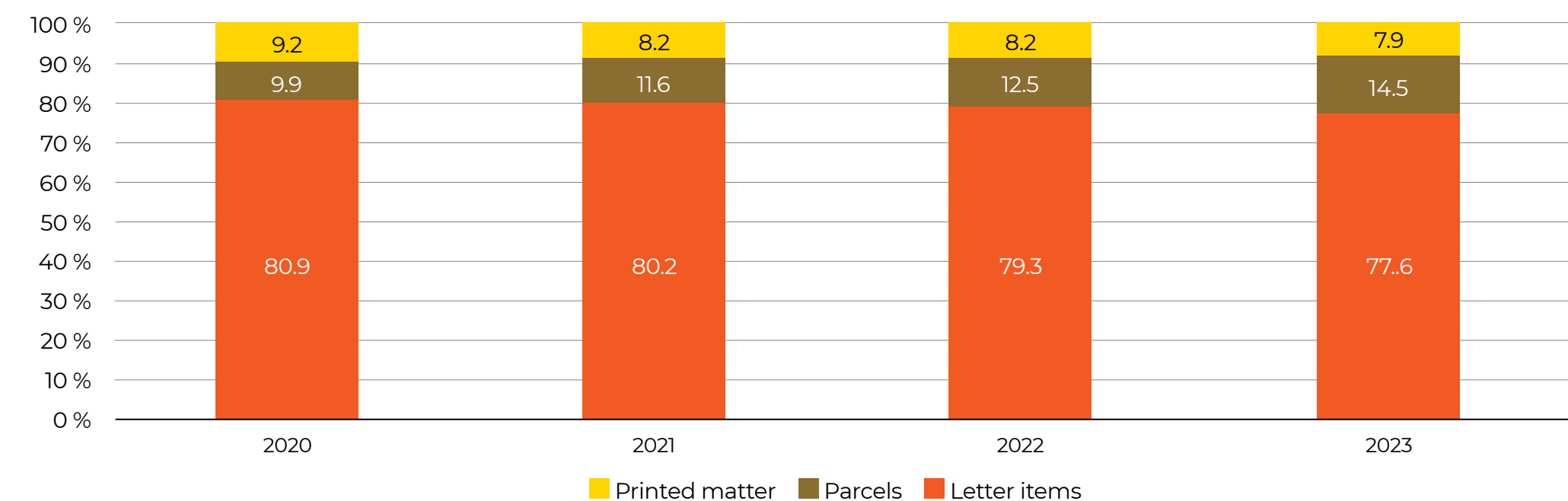
⁸ Letter items, registered mail, insured mail and direct mail.

Figure 3.8 Number of postal services by type (in million)



These developments resulted in a change in the shares of postal service types in the total market, continuing the growth in the share of parcels and the decline in the share of letter items and printed matter. Thus, parcels accounted for 14.5 percent, or 2 percent more than in the previous year, and it is likely that parcel traffic will continue to grow in the years to come.

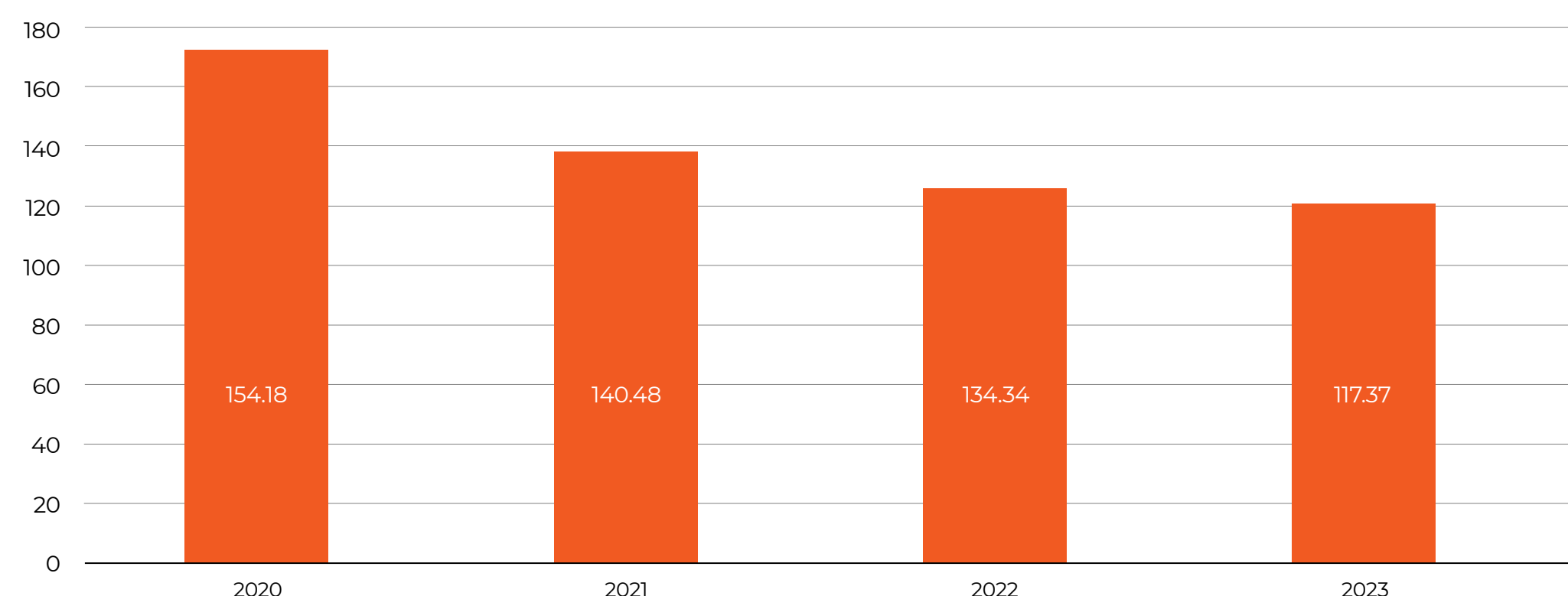
Figure 3.9 Share of postal services by type



UNIVERSAL SERVICE

The universal service⁹ is a set of different postal services in domestic and international traffic the provision of which is in the interest of the HR and which, in addition to adhering to a certain standard of quality, needs to be available at an affordable price and under the same conditions to all users of postal services throughout the territory of the HR. HP is the only provider of the universal service in the HR that acquired the right and the obligation to provide this service pursuant to the PSA. In 2023, a total of 117,369,276 services were realised from within the scope of the universal service, 12.6 percent less than in the previous year, which continued the downward trend. The decline was for the most part a result of prominent digitalisation, most visible in this segment, and partly of the spillover of a share of these services to interchangeable postal services. In the period from 2020 to 2023 some 36.8 million of these services were “lost” and the trend will undoubtedly continue.

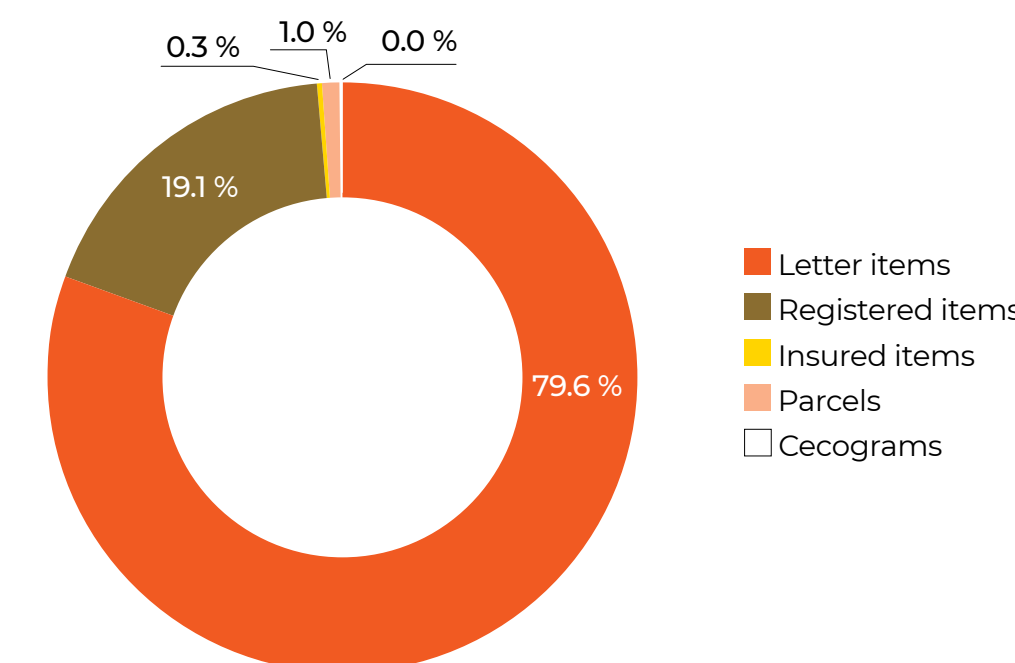
Figure 3.10 total number of services within the scope of the universal service



⁹ The universal service includes postal services in domestic and international traffic: clearance, sorting, transport and distribution of letter items of up to 2 kilograms, parcels of up to 10 kilograms, of registered mail and value-added items and cecograms of up to 7 kilograms and sorting, transport, and distribution of parcels up to 20 kilograms in international inbound traffic.

The smaller number of universal services also resulted in the thus far smallest share in total services, which is 4.7 lower than in the previous year when it stood at 50.4 percent. The smaller number of services did not affect revenues which were even higher than in the previous year and reached some EUR 106m. The reason for this can be found in the increase of the certain portion of prices of individual services in the segment of the universal service which was made in accordance with the Decision setting the highest permissible average weighted price increase by the universal service provider HP. Letter items account for the highest share within the scope of the universal service with some 80 percent, which was 1.8 percent lower than in the previous year. Next to follow is registered mail with a share of 19.1 percent, while all other services account for the rest.

Figure 3.11 Shares of services provided within the scope of the universal service by type



The universal service will maintain its communicational role in the future as a service of general interest, primarily due to its affordability and availability in the entire territory of the HR. However, it is clear that its significance will diminish due to more modern means of communication, resulting in further decrease in the number of this service. A share of services from within the scope of the universal service was realised within the scope of interchangeable postal services¹⁰ because these services, in addition to the universal service provider, may be provided by other providers. In 2023, these services were provided by eight providers that all together provided 56.5 million services, which is 14 percent more than in the previous year and continued the positive trend.

¹⁰ Postal services from the scope of universal service, which may deviate from the conditions of the universal service, such as the obligation of daily delivery or the obligation to provide services in the entire territory of the country, but may from the user standpoint be viewed as being within the scope of universal service because they are sufficiently interchangeable with the universal service.

Such developments are to the greatest extent connected with the “spillover” of certain services from the scope of the universal service to interchangeable services since they are the same or similar services. Interchangeable postal services accounted for a share of some 22 percent of the total market, up 3.4 percent from the previous year and generated EUR 21.2m in revenues. This trend is expected to continue because the changes initiated by HAKOM in relation to the conditions and prices for access to the network of the universal service provider will enable access to a larger number of users and consequently affect the demand for these services.

Other postal services

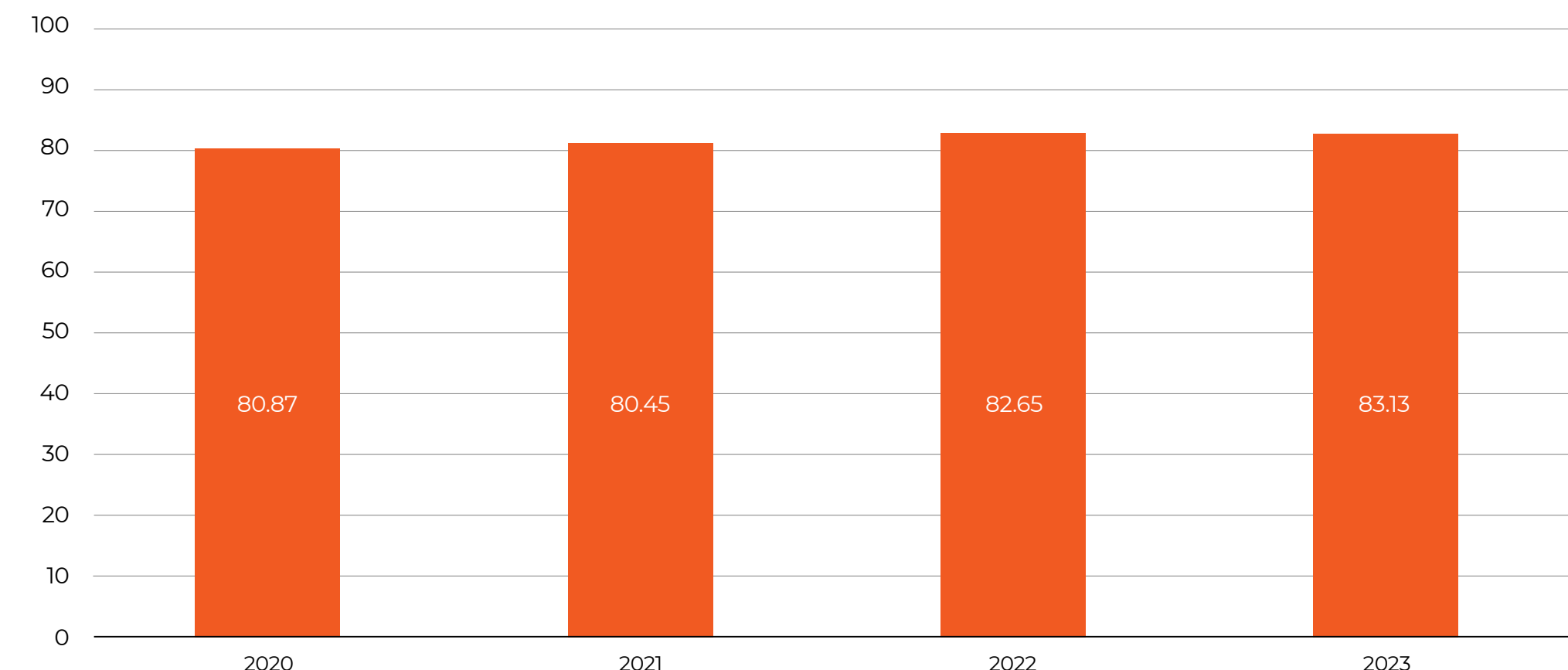
Postal services outside the scope of the universal service or interchangeable postal services include other postal services: basic postal services (letters and parcels) with some added value¹¹, the so-called express parcels, printed matter and direct mail.¹²

The greatest number of providers provide precisely these services so this is the most dynamic part of the market with strongest competition. Namely, within the framework of these services providers are enabled to offer users services that best serve their needs and demands. This means primarily adding new value by adjusting and/or supplementing existing services or introducing new services, as well as using new modalities in providing services connected to e-commerce, while at the same time being able to further grow and develop. A total of 83.125.855 of other postal services were realised in 2023, only slightly more than in the previous year, with the share in the total market increasing by 1 percent to 32.3 percent.

¹¹ Added value means clearing items when called by users, enabling tracking, observing contracted delivery times, etc.

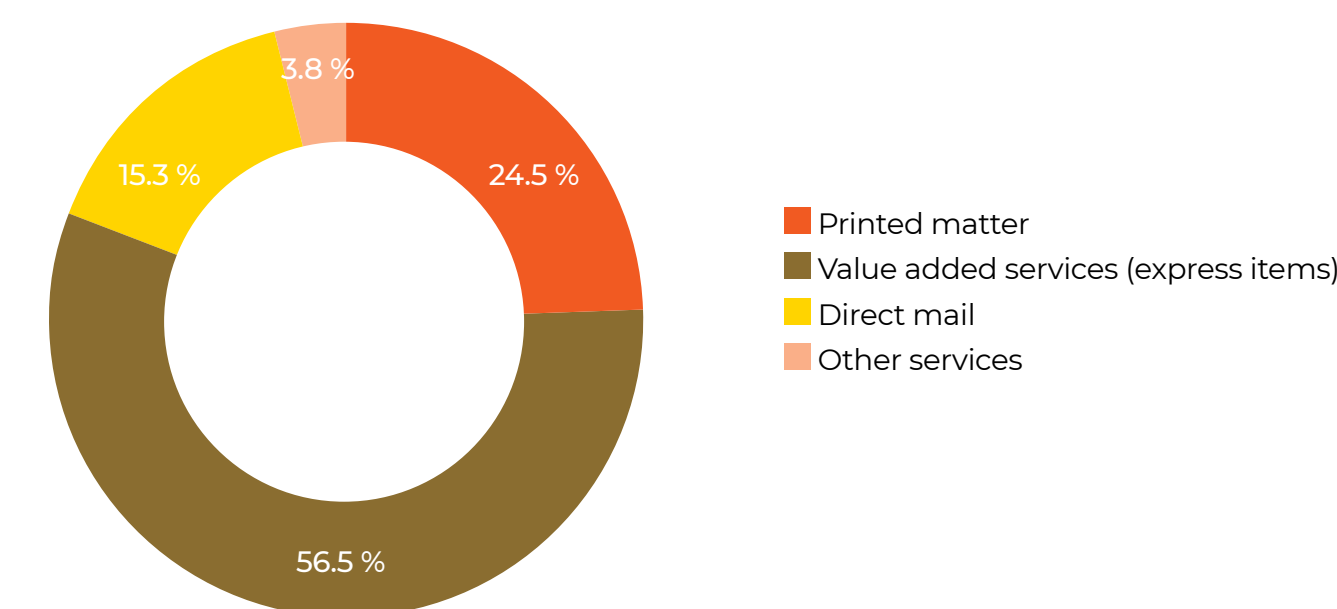
¹² Direct mail – a postal item consisting solely of advertising, marketing or publicity material and comprising an identical message, except the addressee’s name, address, and identification number, as well as other modifications that do not change the nature of the message, which is sent in at least 500 copies.

Figure 3.12 Total number of other postal services (in million)



Although the total number of services did not change, there is some change visible in the structure of realised services, as well as the continuation of the trend from the previous years – the growth in the number of express services paired with the simultaneous decline in all other services. The number of express services grew by 5.9 million from the previous year, raising their share in the total market by 6.8 percent, so that more than 56 percent of all other services has some added value.

Figure 3.13 Shares of services realised within the scope of other postal services by type



The result of the change in the service structure, that is the higher number of express services is best visible in revenues realised from other postal services. Namely, a total of EUR 21.5m more was generated in 2023, with the total revenues reaching EUR 181.2m. The positive trend was continued with the growth rate of 13.5 percent. Revenues from other postal services made up some 58.5 percent of the total postal revenues in the market and were 1.4 percent higher than in the previous year although these services account for around one third of all postal services. These data confirm the potential of higher-value services, especially those connected to e-commerce, where providers with a smaller number of services may increase their revenues and improve their business results. This is even more discernible from the indicators on value added services, i.e. express services, which accounted for a share of 18.3 percent in the total market in 2023 and generated some 55 percent of total revenues, up 2 percent from the previous year. It is expected that this trend will continue, as well as the increase in the number of higher-value services, thus leading to higher revenues.

REGULATORY ACTIVITIES

In 2023, HAKOM carried out all regulatory activities pursuant to the 2023 Annual Work Programme with the focus primarily on ensuring the provision of the universal service and on the protection of users. In doing so, the most attention was dedicated to checking whether the designated provider, HP, met all prescribed requirements in providing the universal service, in terms of coverage of the entire territory of the HR and in terms of the quality of the universal service.

Based on the Methodology for the regulation of prices of the universal service, HAKOM made a new calculation of the price cap for the universal service in the period from 2023 to 2025 and adopted a Decision setting the highest permissible average weighted price increase for HP, the universal service provider, for a basket of services. In addition, an analysis was made of the divergence of key parameters affecting the calculation of the price cap for the purpose of monitoring regulated prices and their possible adjustment. In 2023, HAKOM checked the prices of the universal service in contracts with large users for the purpose of monitoring HP's discount policy.

Pursuant to the provisions of the PSA, HAKOM reviewed HP's regulatory report for 2022 and issued the Statement of Compliance of the Methodology of Accounting Separation. After a detailed analysis of HP's request for reimbursement of the cost of the unfair financial burden arising from the provision of the universal service, HAKOM, as in the previous years, adopted the Decision on the amount of net cost.

An adjustment to prescribed principles was implemented relating to the conditions for access to HP's postal network and relating to the access prices, and pursuant to HP's request for additional

adjustment, amendments were also made to the [Ordinance on the performance of the universal service](#) (Ordinance) in the part pertaining to the regulation of access to the postal network, with the procedure being launched for the initial RIA analysis of the potential amendments.

With a view to optimising the postal network and thus possibly reducing net cost, a share of activities was related to the analysis of the organisation and density of the network of HP's postal offices, leading to the preparation of the proposal of further activities and flexibilization of the regulatory framework providing new options for the structure/organisation of the postal network.

For the purpose of monitoring and analysing the situation in and the development of the postal market in the HR, HAKOM continued to collect data which were used for making analyses, adopting regulatory decisions and preparing various reports. The key indicators on the situation and developments in the market were publicly disclosed and presented to the public. Some of the activities were connected to the verification of compliance of amendments to the general terms and conditions and price lists of the postal service provider with the provisions of the PSA, as well as documents connected with the applications of new providers.

All obligations related to the implementation of international legislative acts were completed in a timely manner, especially those pursuant to the Regulation on cross-border parcel delivery services. The prices of certain services by individual postal service providers were collected and an additional analysis and assessment was made of individual prices of the universal service, which was submitted to the EC and published on its website.

Special attention was awarded to the protection of the rights of users and different activities were implemented on an ongoing basis, among which the resolving of disputes between users and providers of postal services and cooperation with consumer protection associations and service providers deserve special mention. Expert opinions were provided to all requests of users regarding the implementation of the PSA and other regulations from the scope of the provision of postal services and responses were provided to numerous user queries and submissions. The survey of the satisfaction and the needs of postal services users in the HR was continued in 2023, with business entities as subjects.

Multiple inspection supervisions were conducted, of which the majority was regular (in accordance with the supervisory plan) and only a smaller number were extraordinary, based on requests of the users of postal services or conducted ex officio. Inspection supervisions were primarily directed at compliance with the law in the provision of the universal service and compliance with set requirements for universal service providers, the quality of the provision of the universal service and observance of the rights of the users of postal services.

Cooperation with all stakeholders of the Croatian, the European and the global postal system continued. The majority of the activities and cooperation was conducted within the framework of the European Regulators Group for Postal Services (ERGP), with HAKOM's representatives participating in the work of all of its working groups, as well as plenary sessions. Some of the in-

ternational activities were realised in the working groups of the European Committee for Postal Regulation (CERP) and in the Postal Directive Committee (PDC), and bilateral cooperation was realised with individual regulators from the region. The year ended with a traditional round table of all stakeholders in the postal services market in the HR deliberating current topics relevant for the industry, as well as future expectations.

Price cap calculation for the period 20232025

In accordance with the [Methodology for the regulation of prices of the universal service](#) (Methodology), HAKOM prepared the [Price Cap Calculation for the universal service for the period 20232025](#) and in January 2023 adopted the [Decision setting the highest permissible average weighted price increase by the universal service provider HP](#) (Decision) for a basket of services from the scope of the universal service for the period from 12 January 2023 to 31 December 2025. The basket of services from the scope of the universal price includes postal items up to 50g in domestic and international traffic and registered postal items up to 50 g in domestic and international traffic. The Decision prescribed the permissible growth of the average weighted price of the basket of services of 26.50 percent in the entire three-year regulatory period.

HP submitted to HAKOM its new price list, to be applied as of 1 July 2023, laying down new prices for services from the basket of services, in particular: 'Letter of up to 50 g in domestic traffic' with the new price of EUR 0.58 (previously EUR 0.47), 'Registered postal item of up to 50 g in domestic traffic' EUR 2.10 (previously EUR 1.63), 'Letter of up to 50 g in international traffic' EUR 1.70 (previously EUR 1.14) and 'Registered postal item of up to 50 g in international traffic' EUR 5.40 (previously EUR 4.25). Thereafter HAKOM verified the new prices and established that the price increase was within the limits prescribed under the Decision considering that 25.25 percent of the permissible 26.50 percent were utilised by the increase.

As laid down in the Methodology and the Decision, at the end of the second and the fourth quarter of each calendar year within the regulatory period, HAKOM conducts an analysis of the price cap calculation, that is the analysis of the divergence of the realised from the planned values of key parameters that affect the price cap calculation and decides on the correction of prices in accordance with the obtained result should divergences above the materiality threshold of +/- 10 percent be established. The analyses in July 2023 and January 2024 established that the divergences of key parameters were within the permissible framework pursuant to the Decision.

Accounting separation (Regulatory Financial Statement)

The PSA lays the obligation of accounting separation for the providers of postal services, especially the provider of the universal service, as well as HAKOM's competence. Accordingly, the provider of the universal service, HP, submitted to HAKOM in June 2023 the Regulatory Financial Statement (RFS) for 2022 with associated documents, which was prepared in compliance with HAKOM's [Instructions on accounting separation and cost accounting of the universal service provider](#) (Instructions).

Pursuant to the provisions of the PSA, HAKOM is obligated to initiate the procedure to verify the accounting separation of HP's revenues and expenses, including an audit by an independent audit company. After the completion of the public procurement procedure, the RFS audit was conducted by the company Crowe Revizija d.o.o., which concluded that the 2022 RFS was prepared in compliance with the Instructions and corresponded to cost accounting documents and complied with International Financial Reporting Standards.

After the audit and pursuant to the auditor's opinion, HAKOM issued a [Statement of Compliance of the Methodology of Accounting Separation by the Universal Service Provider, HP](#), confirming that HP's 2022 RFS complied with all prescribed requirements by its form, content and methodology.

Universal service provider's net cost

Pursuant to the provisions of the PSA, if the obligation to provide the universal service generates net cost which constitutes unfair financial burden on the universal service provider, the universal service provider is entitled to the reimbursement of the determined cost of the unfair financial burden from the state budget.

In June 2023, HAKOM received a Request from the provider of the universal service, HP, for the reimbursement of the cost of unfair financial burden (net cost) in 2022 (Request). In its Request HP described the difference in its operation when it is obligated to provide the universal service as against the situation without such an obligation, as prescribed by Article 50, paragraph (1) of the PSA. Pursuant to the Request, the difference in HP's financial results when having the obligation to provide the universal service and without it would be EUR 16,504,913 (HRK 124,356,264), which was, according to HP's stipulation, the amount of the net cost of the universal service for 2022.

In accordance with the provisions of the PSA and the [Instructions on the calculation and reimbursement of the net cost of the universal service and assessment of the unfair financial burden](#), and with the help of the independent consultant, the company Crowe Revizija d.o.o., HAKOM verified HP's calculation of the net cost.

Pursuant to the verification and implemented corrections, HAKOM established in its [Decision](#) that the net cost for 2022 was EUR 14,772,714.58 (HRK 111,305,018), instead of EUR 16,504,912.60 (HRK 124,356,264) which is EUR 1,732,198.02 (HRK 13,051,246) less than the amount that the HP requested in its Request.

Universal service prices

One of HAKOM competences under the PSA is to monitor and regulate the universal service prices and determine whether they comply with the provisions of the PSA and the guidelines of the EU Postal Services Directive.

In addition to the verification of price caps relating to the basket of services, in cooperation with HP and by analysing the applied prices of the universal service in contracts with large users, HAKOM conducted the procedure of harmonising HP's price list with the provisions of the PSA, so that prices and special conditions on the list are transparent, understandable and available to everyone under the same conditions. As of 1 January 2023, HP applies new discounts policy under which operative discounts are repealed and the price list provides only for discounts on the quantity of submitted postal items. Therefore, in 2023, by checking contracts HP concluded in relation to postal services, HAKOM monitored the implementation of the new discounts policy set laid down in the price list as of 1 January 2023.

In addition to the change in the price of the four most frequent postal services from the regulated basket of services (price cap), as of 1 July 2023, HP amended prices in all weight categories for the universal service: letter item, priority letter item, postcard (greeting card, picture postcard), registered mail item, insured mail and ancillary service of delivery receipt, which in consequence resulted in the change in the price of judicial documents. It was established that the above prices complied with the provisions of the PSA.

Network access

In 2023, HAKOM regularly, upon receiving the new terms and conditions and the price list, verified whether the Terms and conditions of access and the Access price list were in line with the provisions of the PSA and of the Ordinance, that is, whether the prices of access to the postal network were set in accordance with the principles laid down in the Ordinance, as well as verified all other documents HP submitted to it. In the fourth quarter of 2023, HP submitted a request for an additional adjustment and amendments to the Ordinance in the part governing access to the postal network pursuant to which HAKOM initiated the procedure of the initial RIA analysis (Regulatory Impact Analysis) of the possible amendments to the Ordinance.

Regulation on cross-border parcel delivery

[Regulation 2018/644](#) of the European parliament and the Council on cross-border parcel delivery services (Regulation) and the implementing acts adopted pursuant to the Regulation have been in force for several years, aiming at removing barriers in postal traffic and developing e-commerce in EU Member States, that is, ensuring that all advantages of the single European market were provided to domestic consumers, as well as entrepreneurs. The transposition of the Regulation into the national legislation placed new regulatory tasks and obligations before HAKOM, which it fulfilled in 2023, as in the previous years, in line with the provisions of the Regulation.

Through the prescribed questionnaires HAKOM thus collected various data in 2023 on cross border delivery services from providers of postal services relating to cross-border delivery, in particular, relating to prices of services, their quantity, revenues and employees. After being processed, the data were forwarded to the EC. Based on HP's publicly disclosed prices of services in the EC's PARCEL application, and in accordance with the provisions of Article 6 of the Regulation, HAKOM conducted an assessment of cross-border single-piece parcel tariffs charged per single-piece parcel of the parcel delivery service provider subject to a universal service obligation. Taking into account the mentioned assessment procedure, HAKOM concluded that cross-border tariffs for latter items cannot be considered unreasonably high. It also assessed that the prices of parcels in international traffic with Member States were justified, although a review of the tariffs for countries in the third delivery zone showed that they were above the reasonability threshold set by the EC. The reason for this were low bilateral quantities and high transport costs and charges. HAKOM submitted its assessment of the reasonability of cross-border parcel delivery tariffs to the EC, which publishes them on a dedicated website for cross-border delivery services, thereby fulfilling its obligation under the Regulation.

Quality of universal service performance

Quality is an important element of user satisfaction. Therefore, attaining the prescribed level of quality is the objective of all EU Member States within the single market for postal services. Accordingly, HAKOM directed a share of its regulatory activities towards supervising and monitoring quality, that is, meeting the prescribed standards of quality of the universal service provision. The measurement and quality criteria to be met by the universal service provider in the RH in inland and international traffic are prescribed by the PSA and the Ordinance. Measurements are conducted in accordance with the prescribed norms and it is the obligation of the universal service provider to submit to HAKOM a Report on the quality of the universal service performance (Report). The parameters measured are the time of delivery of postal items from clearance to delivery to determine whether delivery was ensured within prescribed deadlines¹³ and the number of complaints and compensation claims.

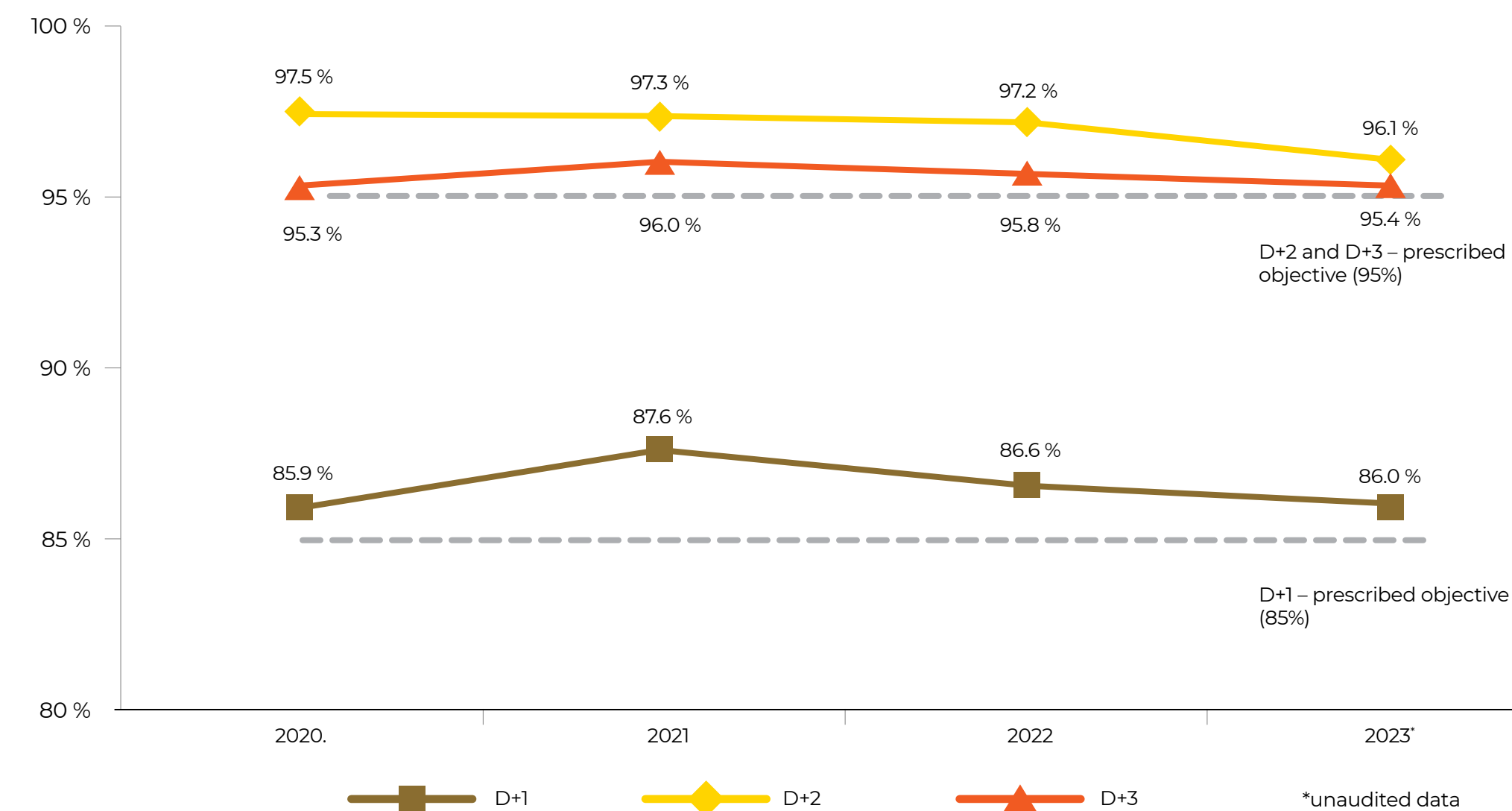
According to the 2023 Report, HP conducted two measurements of the quality of performance of the universal service by measuring the transfer of international priority letter items. One measurement was within the framework of the Universal Postal Union (UPU) between the HR and individual UPU members, while the other had to do with the UNEX measurement of traffic between the HR and other EU Member States with established flows in international traffic, which were conducted by the IPC.

The UNEX measurement showed that quality improved from the previous year but that the prescribed criteria were still not met considering that some 50.6 percent of priority items were delivered within the D+3 time limit and some 82.7 percent of postal items within the D+5 time limit. The submitted results of other EU Member States showed that the HR was no exception as other Member States also failed to meet the prescribed criteria, which confirms that there are certain problems present in international traffic.

The quality of the universal service in domestic traffic was measured by ongoing measurement of the conveyance of priority and non-priority postal items throughout the entire 2023. According to the results, all the prescribed criteria were met. This means that 86.0 percent of priority postal items were delivered within the D+1 time limit, 96.1 percent in the D+2 time limit and 95.4 percent of non-priority postal items within the D+3 time limit. As in the previous years, an audit of the measurements and obtained results from the 2022 Report was carried out to verify measurement results. Audit results showed that measurements fully complied with the requirements of the prescribed norms and measurement results could be confirmed.

¹³ Universal service providers in domestic traffic must ensure the delivery of 85 percent of postal items of the fastest category (priority items) in one working day, i.e. 95 percent within two working days, and for all other shipments 95 percent within three working days. In international postal traffic with EU Member States universal service providers must ensure the delivery of 85 percent of the fastest category items within three working days, i.e. 97 percent within five working days.

Figure 3.14 Measuring the quality of universal service in domestic traffic



The data relating to the measurement of the number of complaints and compensation claims from the 2023 Report show that users submitted more complaints concerning the performance of the universal service than in the year before. There were altogether 30,509 complaints submitted or some 25 percent more. Of the total number of complaints, 54 percent was related to services in international traffic, while the remaining share was related to domestic traffic. The most frequent reasons for submitting user complaints were the loss of postal items and non-compliance with delivery deadlines. The results show that HP handled some 87 percent of all complaints within the statutory time frame. The indicators from the Report lead to the conclusion that in 2023 the quality of the performance of the universal service was satisfactory.

Universal service provider's postal network

As in the previous years, within the framework of its activities, HAKOM awarded special attention to HP's postal network and fulfilment of requirements relating to the density and working hours of postal offices. The universal service provider is obligated to establish, maintain and develop a postal network throughout the territory of the HR in the manner prescribed by the PSA and the Ordinance which additionally

prescribes the density of the access point network¹⁴. In 2023, it was no longer necessary to implement measures relating to the operation and working hours of postal offices implemented by the HP during the pandemic so working hours of postal offices were restored to their usual times with certain adjustments depending on the new needs of users. In accordance with the provisions of the Ordinance relating to the organisation and type of postal offices, HP changed the status of 154 postal offices from permanent postal offices to non-permanent postal offices¹⁵. In addition, with a view to rationalise its operations in accordance with the strategy of relocating existing postal offices for the purpose of better service accessibility, HP continued with its model of relocating unprofitable postal offices to more frequented locations. Several postal offices were thus relocated from existing to new locations, avoiding their permanent closure and additionally improving working conditions for employees and the provision of services to users. Within its competences, HAKOM undertook all activities related to changes in the organisation and relocation of postal offices, i.e. the verification of HP's activities and their compliance with the provisions of the PSA and the Ordinance. The said changes did not erode the prescribed criteria so the total number of postal offices remained unchanged at 1,016 postal offices distributed throughout the territory of the HR:

In 2023, HAKOM's activities included work on the project of analysing the organisation of HP's postal offices network, its compliance with the relevant provisions of the Ordinance and relevant social analyses of CBS data and the preparation of proposals for further actions and flexibilization of the regulatory framework, containing options for new organisation of the postal offices network with a possible impact of proposed options on net cost (unfair financial burden) and the quality of the universal service. The implementation of the results of the analysis and amendments to the Ordinance is expected in 2024.

Monitoring and analysis of the situation in and development of the postal services market

Within its competence, HAKOM carries out activities related to the monitoring and analysis of the situation in and development of the postal services market. For this purpose, it collected different statistical, financial and other data from postal service providers on a quarterly and annual basis. The collected and processed data were used for analyses and regularly published.

The data were also used to comply with the requirements of the EU authorities competent for the monitoring and analysis of the situation in the EU's postal market (EC, ERGP, UPU), in particular for completing various questionnaires, drafting responses to various external queries (media, providers, etc.), as well as to meet the requirements of various different bodies and institutions (MSTI, CBS, CCA, etc.).

¹⁴ The postal offices network must be organised so that one postal office covers the area of a maximum of 80km², that is a maximum of 6,000 inhabitants, and needs to count a minimum of 700 regular postal offices.

¹⁵ Non-permanent postal office is a postal office in which the universal service provider, at least two days a week, provides the universal service.

In 2023, the most important indicators of the situation and the developments in the postal services market were regularly published on HAKOM's website, as well as the [updated list of postal service providers](#) together with the list of services they provide. In accordance with the PSA, a database relating to the registry of postal service providers was maintained and updated. By analysing the situation in the market, HAKOM established certain business activities indicating the provision of postal services by several companies. Consequently, these companies were called to comply with the provisions of the PSA and ultimately one of them submitted an application for registration of the performance of postal services.

Other regulatory activities and tasks

Some of other regulatory activities that HAKOM performed in accordance with its Annual Work Plan were related to procedures connected to the registration/unlisting of the postal service providers, as well as verification of the compliance of submitted changes/amendments to the general terms and conditions and price lists of postal service providers with the PSA. In 2023, HAKOM issued multiple expert opinions and explanations as to the implementation of the PSA and other regulations adopted pursuant to the PSA. In accordance with the PSA, HAKOM carried out an analysis of the situation in the HR postal services market to establish whether there were other postal service providers except HP that would be able to provide the universal service as prescribed by the PSA. The said analysis established that, in addition to HP, there was no other postal service provider in the market that could ensure the provision of the universal service in compliance with the prescribed quality level in the entire territory of the HR.

In December 2023, HAKOM organised the 10th round table of the stakeholders in the postal services market in Zagreb, whereby maintaining open dialogue with the stakeholders in the HR postal services market. HAKOM's representatives held presentations providing an overview of the situation and trends in the HR and the EU postal services markets and relating to the results of the social survey of the satisfaction and needs of postal service users (business entities), as well as an overview of international activities in the segment of postal services. The opportunity was also used to exchange information on other recent developments in the postal market. A presentation was also held by the president of the association eCommerce Croatia, who presented their latest research on online buyers. As part of the event there was a panel discussion in which all participants in the round table had the opportunity to exchange opinions and hear practical experience regarding current and future trends in the EU postal sector, with the stress being laid on e-commerce and the manner of delivery of postal items generated by e-commerce at present and in the medium term.

On working days users were provided with the opportunity to obtain information from HAKOM via telephone, e-mail, social networks or the *Ask Us* application, available on HAKOM's website. HAKOM's experts also participated in various forums and events organised by consumer protection associations where users were provided information regarding their rights in relation to the provision of postal services.

The survey of the satisfaction and needs of postal services users in the HR continued in 2023, focusing on business users. The objective of the survey was to monitor the use of postal services by business users and their satisfaction with prices, time limits and service quality. A survey was conducted of whether users were informed about the services provided by all postal service providers, as well as of their satisfaction with the scope and quality of the provision of offered services, the scope and frequency of sending and receiving postal items and the use of new delivery services (parcel delivery lockers and pick-up points). The survey predominantly focused on HP as the national provider of the universal service in the HR but also on other postal service providers. The survey was conducted on the representative sample of 501 business entities, selected by size, institution and region. [Survey results](#) were published and are available on HAKOM's website.

INSPECTION ACTIVITIES

In 2023, postal inspectors conducted 56 inspection supervisions, carrying out inspection examinations, inspections, interviews, and reviews. A part of the activities was related to the follow-up of previously adopted decisions. Inspection supervisions were completed with the adoption of the decision on execution and the decision on mandatory execution, while the elimination of established deficiencies was laid down in related minutes. A motion for indictment was submitted for the purpose of initiating misdemeanour proceedings. All decisions adopted as part of inspection supervisions are publicly disclosed on [HAKOM'S website](#). When assessing the grounds for initiating inspection supervision proceedings ex officio, the submissions of users and other notifications indicating the need to protect public interest due to infringements of the provisions of the PSA were taken into consideration.

Inspection supervisions were for the most part conducted over HP as the provider of the universal service with supervisions being directed at the quality of service performance and the rights of users of postal services. Two decisions were adopted in inspection supervision proceedings regarding the performance of the universal service connected with the execution of a previously adopted decision, with related minutes ordering the elimination of deficiencies established, and a motion for indictment was submitted to initiate misdemeanour proceedings.

In view of the received submissions, the postal inspectors conducted inspection supervisions, which, in essence, established that HP did not comply with the previously adopted [Decision](#), by which HP was ordered that, when providing the universal service in domestic traffic, it was to ensure to all users the delivery of received letters, as a rule, by delivery to their mail box, within the time limit set for delivery of postal items in domestic traffic, as laid down in HP's General terms and conditions for the provision of the universal service. Therefore, the [Decision on execution](#) and the [Decision on mandatory execution](#) were adopted following the inspection supervision, imposing a fine on the responsible persons of HP for failure to comply with a decision.

As regards the factual situation established in the conduct of inspection examinations of postal branch offices 51000 Rijeka, 21400 Supetar, 47300 Ogulin and 52100 Pula, which, in essence, established that HP, when performing postal services failed to deliver or made no attempt to deliver to recipients a significant number of regular postal items, as a rule via the delivery to the mail box, as it was obligated to do pursuant to the provisions of the PSA, that is, as it was ordered in the previously mentioned decision, the inspector ordered HP in its minutes to ensure the delivery or the attempt to deliver these postal items via the delivery to the address of the recipient, as a rule, by delivery to the mail box of the recipient, as HP ultimately did.

At the proposal of the postal inspector, HAKOM submitted a motion for indictment against HP for failure to deliver registered mail to the recipient or other authorised persons against signature when providing postal services.

When conducting inspection supervision over the performance of interchangeable and other postal services, the attention was focused on the fulfilment of the prescribed obligations by providers of interchangeable and other postal services relating to the rights of the users of postal services. These supervisions were conducted over two postal service providers: HP and DPD CROATIA d.o.o.

Based on the submission received by a provider of postal services in which the submitting party stipulated that a legal person was providing postal services without submitting the application to HAKOM pursuant to Article 17 of the PSA, the inspector verified compliance with the provisions of Article 17 of the PSA, which prescribes that the right to provide interchangeable postal services and other postal services is acquired by a natural or legal person as of the date of submission of a complete application to HAKOM. The person making the submission was notified that the conditions for initiating inspection supervision proceedings referred to in Article 59, paragraph (1) of the PSA ex officio were not met because pursuant to the data that the reported legal person presented at the request of the inspector the mentioned legal person did not provide postal services and because the petitioners failed to provide evidence corroborating that the reported legal person had been providing postal services in the sense of the provisions of the PSA.

In addition, by adopting two Decisions HAKOM rejected as unfounded the complaints of persons making the submissions against inspector notifications, by which the petitioners were notified that in relation to the submission conditions were not met for initiating inspection supervision ex officio. Against one of HAKOM's decisions, the petitioner initiated administrative proceedings before the Administrative Court in Split, which reached a [decision](#) rejecting the claim.

A photograph of a train driver in a dark suit and white shirt, seen from behind, operating a train. The driver is seated at a control panel with two monitors and various controls. The train is moving along tracks, with overhead power lines visible. The entire image has a green tint. In the bottom right corner, there is a semi-transparent dark green shape.

04

**RAIL
SERVICES**

RAIL SERVICES

Creating a sustainable, smart, safe and resilient transport network, especially the railway network as the transport segment which can contribute the most to green transition is the EU's initiative that has also been joined by the Republic of Croatia in accordance with the Strategy for the development of the railway system in the Republic of Croatia until 2032. In accordance with the guidelines for better regulation, activities were undertaken at the EU level directed at establishing measures for better management and coordination of cross-border railway traffic, focusing on services provided by infrastructure managers to operators in railway traffic, in order to provide them with access to the railway infrastructure. The objective of the initiative is to contribute to the transition of freight transport to the railway, aiming to ensure the maximum reduction of EU's gas emissions from transport – as planned, by 90 percent by 2050.

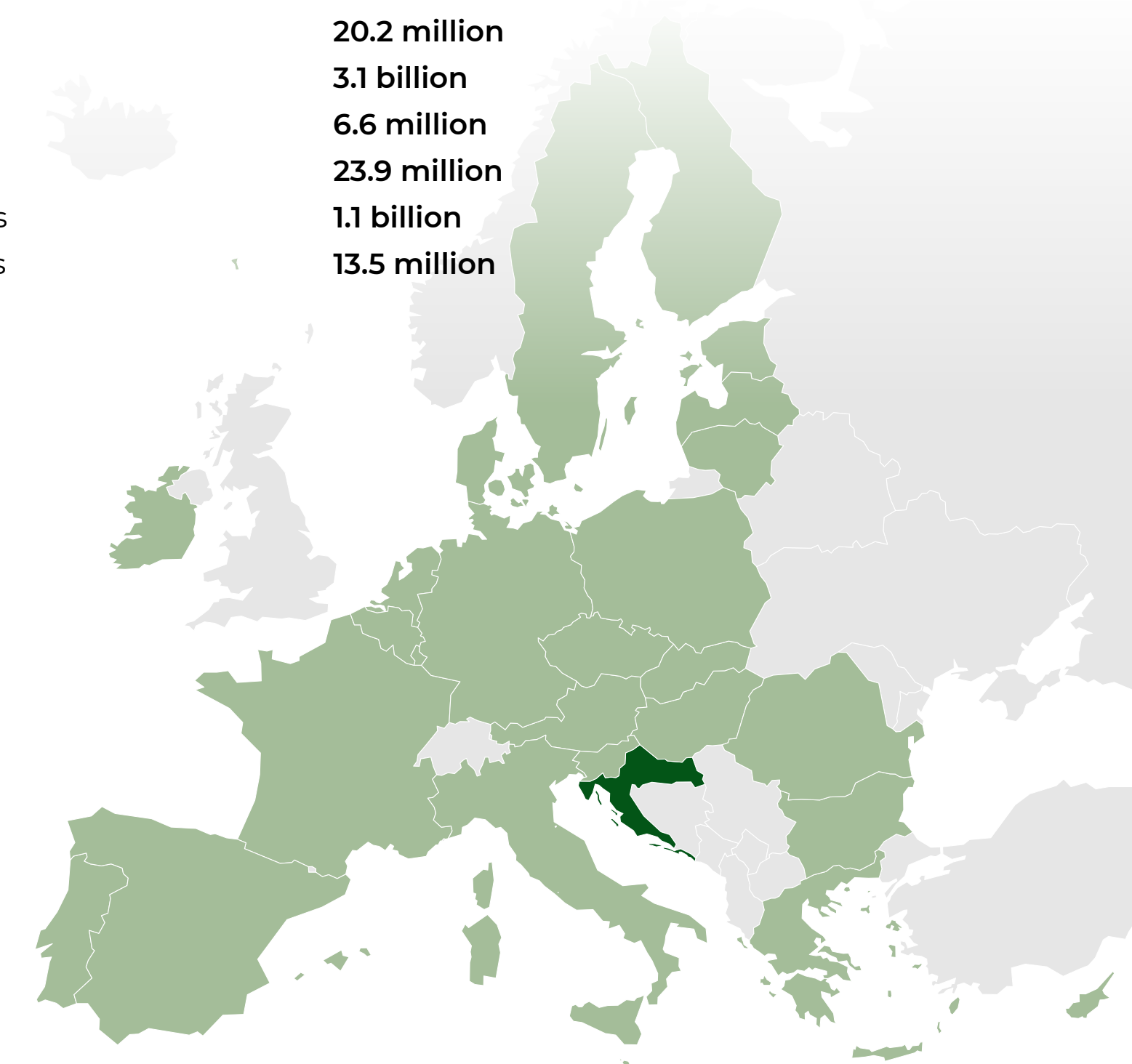
However, sustainability was not the only focus in 2023. Activities undertaken at EU level aimed to fully utilise digital technology for higher efficiency, safety and mobility and to support the EU's railway sector as it recovers from the impacts of the COVID-19 pandemic.

In 2023, HAKOM participated in numerous work meetings of the EU's railway organisations and EC meetings, striving to implement the European practices and guidelines in its regulatory activities in the railway market of the HR.

MARKET OVERVIEW

Figure 4.1 Basic information on the railway infrastructure and operation of railway undertakings at the end of 2023

REPUBLIC OF CROATIA	
❖ Length of railway network in the HR	HŽ Infrastruktura d.o.o. 2,617 km
❖ Number of freight undertakings	19
❖ Broj teretnih prijevoznika	2
❖ Number of passenger undertakings	5
❖ Maritime ports	3
❖ Inland waterway ports	15.1 million
❖ Goods transported (t)	20.2 million
❖ Total train kilometres	3.1 billion
❖ Total net tonne kilometres	6.6 million
❖ Freight train kilometres	23.9 million
❖ Passengers carried	1.1 billion
❖ Total passenger kilometres	13.5 million
❖ Passenger train kilometres	

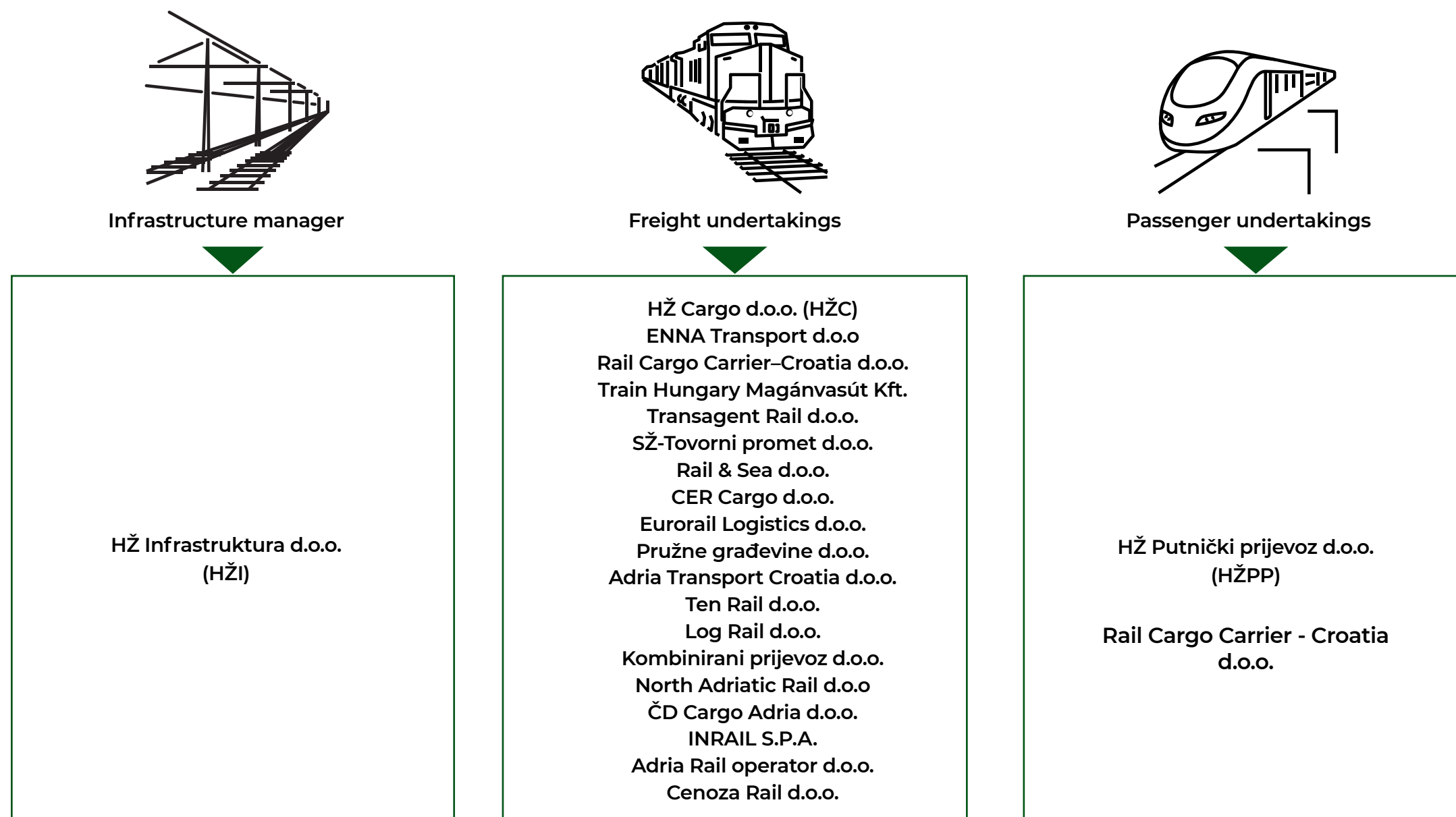


Stakeholders in the rail services market

The number of registered freight undertakings increased further in 2023. By regularly consulting the European Railway Agency Database of Interoperability and Safety, ERADIS, and by cooperating with the infrastructure manager, HAKOM established that there were 19 freight undertakings in 2023 in the HR. However, 6 of the 19 did not provide the service of goods transport during the year.

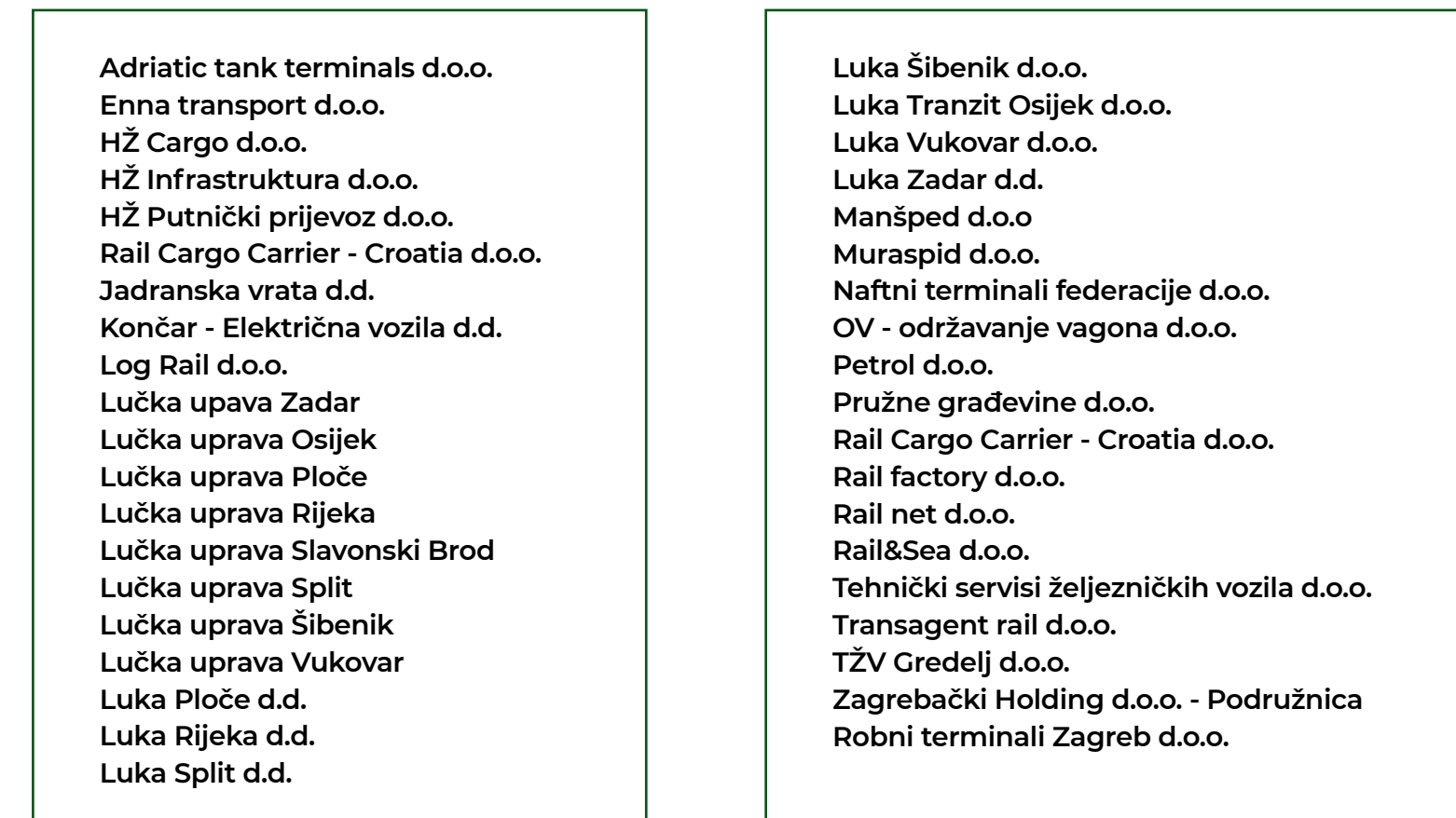
In addition to the passenger incumbent, HŽ Putnički prijevoz (HŽPP), a special train for the transport of passengers was for the first time operated by Rail Cargo Carrier-Croatia d.o.o., as the newly licensed undertaking for the provision of the service of railway passenger transport in the HR.

Figure 4.2 HR rail services market in 2023



Stakeholders in the rail services market include the operators of service facilities, who represent the legal person responsible for operating one or more service facilities or the provision of one or more services to railway undertakings pursuant to the [Railway Act](#) (RA). The [Register of the railway services of service facilities operators](#) is published on HAKOM’s website.

Figure 4.3 Service facilities operators

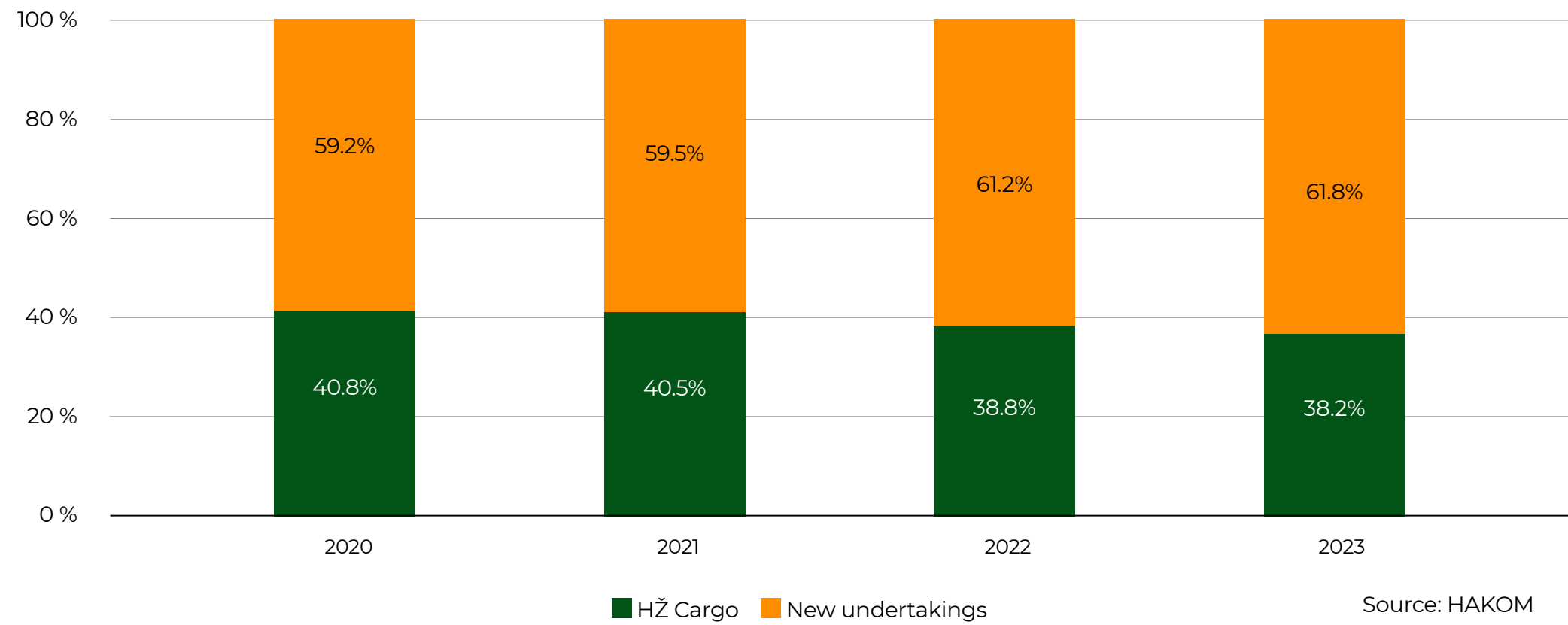


Market structure and performance indicators of railway undertakings in the rail services market

In accordance with the [Act on the Regulation of the Rail Services Market and the Protection of Passenger Rights in Rail Transport](#) (ARRSM), HAKOM monitors market competition in the rail services market and collect the data required for regulating the rail services market and the data required for statistical monitoring of the market. All newly registered undertakings are obligated to notify HAKOM of their registration. The data collection forms are sent to all undertakings in the rail services market on a quarterly basis and the data collected are published and forwarded to the European Commission on an annual basis.

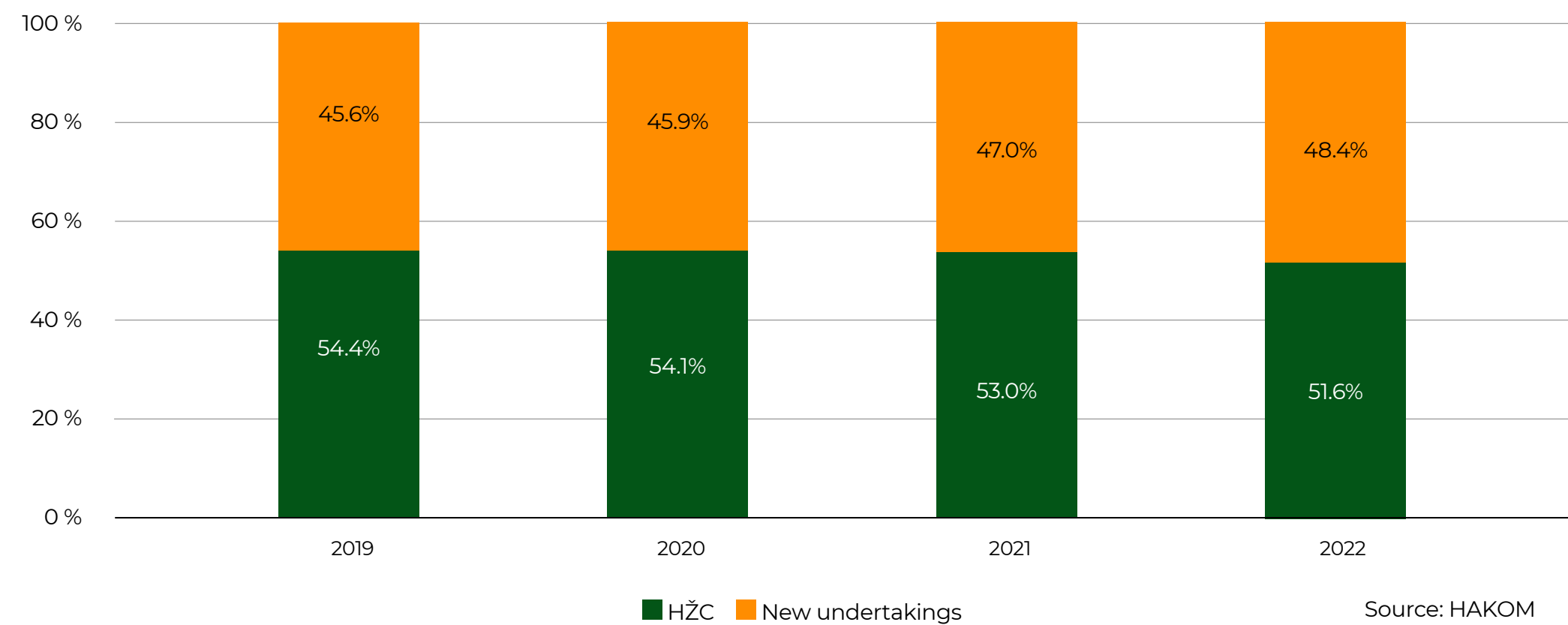
According to the data on the operation of railway undertakings, the operation of freight undertakings decreased, while in passenger transport indicators showed an increase. In 2023, the rail network was used to transport a total of 15.1 million tonnes of goods, i.e. 7.2 percent less than in the previous year. The share of new railway undertakings in total transported goods increased by 0.6 percent relative to the passenger incumbent.

Figure 4.4 Market shares by goods transported in railway freight transport



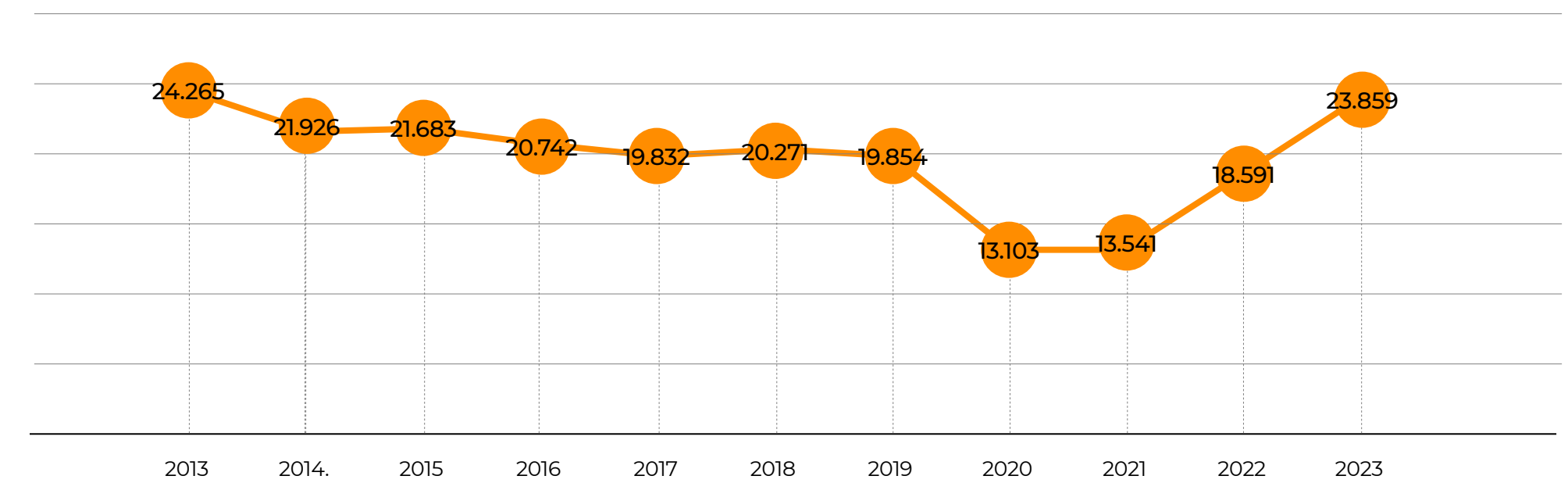
The number of total realised tonne-kilometres of all undertakings decreased by 10.9 percent in 2023. New undertakings thus realised 8.2 percent less tonne-kilometres and the incumbent undertaking 13.2 percent less than in the previous year. Although the ratio is decreasing, the incumbent undertaking still holds a larger share in tonne-kilometres.

Figure 4.5 Shares in tonne-kilometres in railway freight transport



Although the number of transported passengers drastically decreased during the pandemic, passenger transport has been rising healthily since 2022. In 2023, the number of passengers rose by 28.3 percent and almost reached the 2013 figure.

Figure 4.6 Number of transported passengers (in thousands)



RAILWAY INFRASTRUCTURE AND SERVICE FACILITIES

Pursuant to the RA, HŽI and service facilities operators are obligated to ensure all interested railway undertakings the right of access to the railway infrastructure, as well as the use of tracks that connect maritime ports, inland waterway ports and other service facilities under equal, transparent and non-discriminatory terms. The information required by applicants for the provision of transport services must be contained in the Network Statement (NS) which, pursuant to the RA, the HŽI creates for each timetable.

A part of the railway network operated by the HŽI is the Mediterranean rail freight corridor 6 (RFC 6) established by Regulation (EU) 913/2010 concerning a European rail network for competitive freight, which corresponds to the Mediterranean corridor of the TEN-T network and the rail freight corridor Alps–Western Balkans (RFC 10), established together by four EU Member States (Austria Slovenia, Croatia and Bulgaria). The corridor connects Austria (Salzburg and Wels/Linz)

with Svilengrad, a town on the Bulgaria–Turkey border. HŽI manages 2,617 km of the railway infrastructure in the HR, of which 2,341 km single-track and 276 km double-track railway lines. According to the NS data, the length of electrified tracks increased to 1,013 km, some 38.7 percent of the total rail tracks in the HR. Of this figure, 1,010 km are with the alternating current system of electrification with 25 kV and 50 Hz, while the remaining 3 kilometres are electrified with 3 kV DC power supply system. Although gradually increasing, the electrification of railway lines in the HR continues to lag behind the EU average of 56¹⁶ percent. In addition to improving the quality of transport and reducing operating costs, electrification has a strong impact on gas emissions. All this makes it necessary to continue with further electrification and modernisation of the electric traction power system to achieve reliable and quality railway transport services while protecting the eco-system, which is the ultimate objective of all EU Member States.

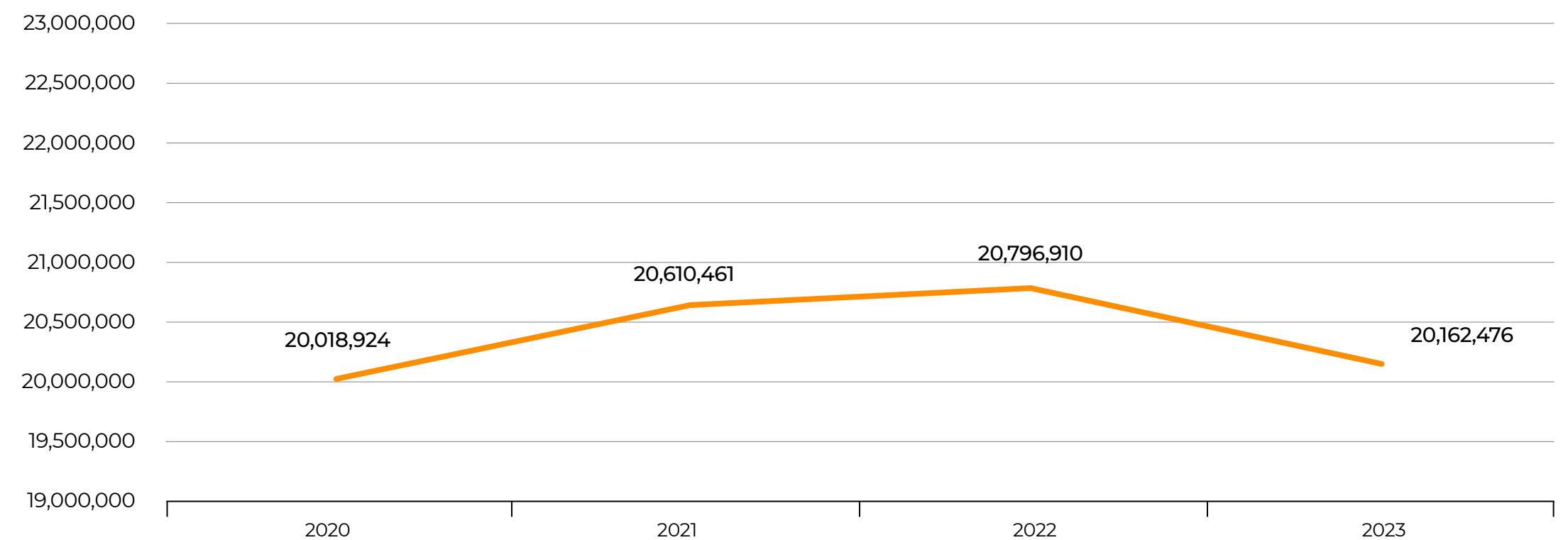
As part of the NS HŽI also publishes a list of service facilities it operates, the services it provides and the associated fees. In accordance with Commission Implementing Regulation (EU) 2017/2177 of 22 November 2017 on access to service facilities and rail-related services (Implementing Regulation 2017/2177), the operators of service facilities are obligated to publish a service facility description. HAKOM's reviews established that HŽI regularly publishes an invitation for the submission of documents or links to service facility descriptions to other service facilities operators. The received documents or links to service facility descriptions are then published as an Attachment to the said NS.

16 12th Annual Market Monitoring Report.

INFRASTRUCTURE USAGE

The indicators of infrastructure usage are train-kilometres (tkm) realised by railway undertakings in the period under review. Pursuant to collected data and HAKOM's analyses, railway undertakings realised 8.7 percent less tkm than in the previous year.

Figure 4.7 Total realised tkm



The passenger undertaking realised 13,524,242 tkm in 2023, while freight undertakings realised a total of 6,637,778 tkm. The incumbent freight undertaking decreased its tkm by 11.7 percent, and new undertakings by 5.4 percent from the previous year.

Figure 4.8 Shares of infrastructure use by freight undertakings in train-kilometres

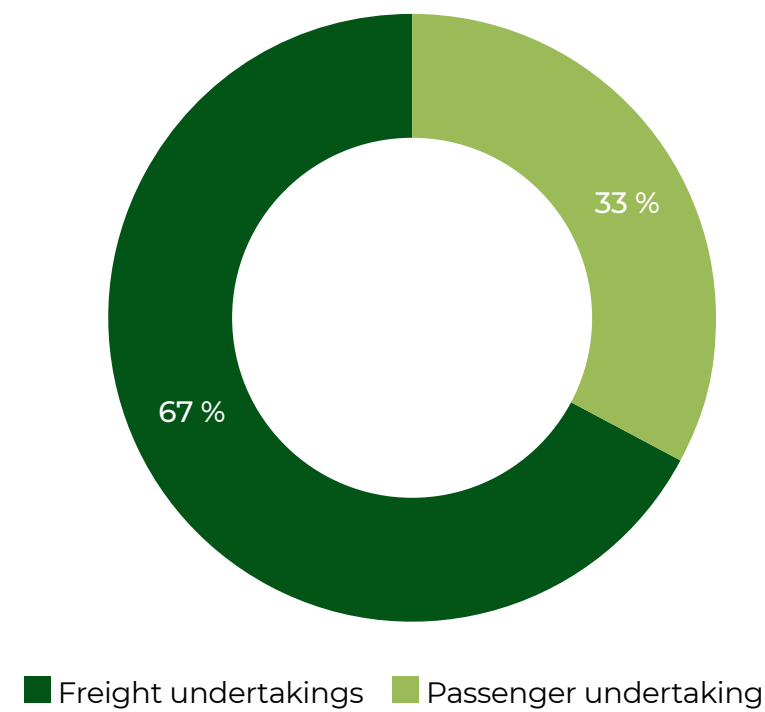
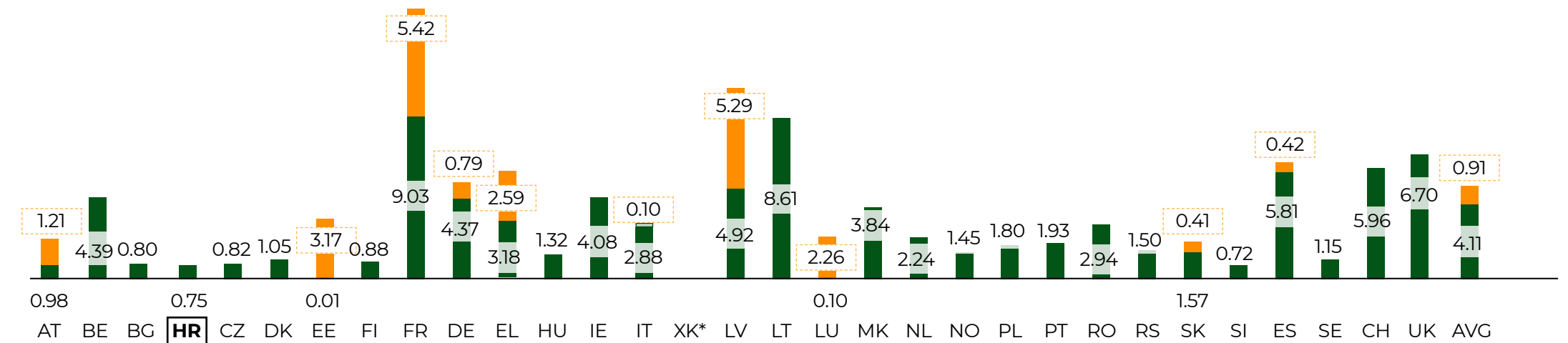


Figure 4.9 Charges for MAP in EU Member States in 2022 (EUR/tkm)



The minimum access package

The minimum access package (MAP) is the most important service, that is a group of services provided by the HŽI, which includes:

- the processing of applications for the allocation of infrastructure capacity;
- the rights of use of the allocated infrastructure capacity, the use of railway infrastructure, including turnouts and nodes;
- the management of train traffic, including signalisation, regulation, train reception and dispatch, as well as communication and provision of information on train movements;
- the usage of available equipment for supply of electricity required for towing trains;
- the provision of other information required to realise or provide the service for which the capacity has been allocated.

HŽI generated a total of EUR 14.97m from the MAP, of which passenger undertakings were charged EUR 7.34m and freight undertakings EUR 7.63m. The average price per train-kilometre for the use of MAP in the HR for the 2022/2023 timetable was EUR 0.75. However, the average amount of the charge per train-kilometres in freight transport was EUR 1.15, while the average amount per train-kilometre in passenger transport was EUR 0.54.

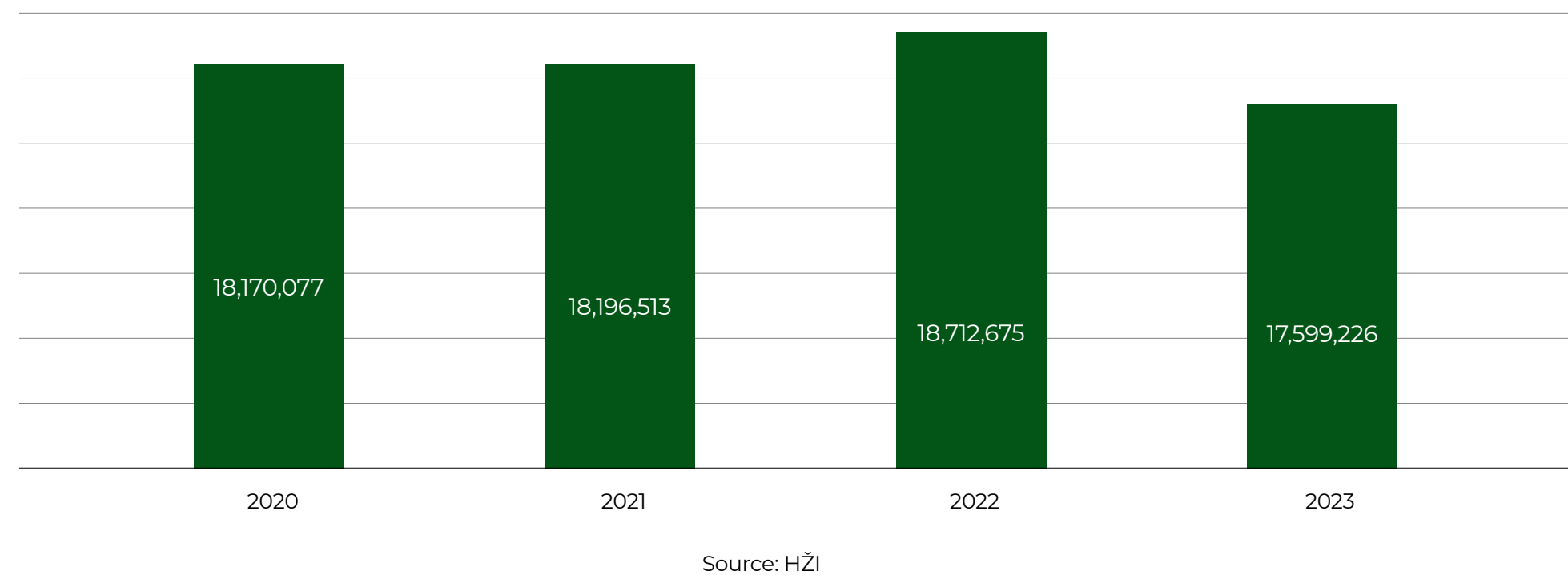
In 2023, HAKOM continued with the implementation of the project Analysis of the cost distribution and charges calculation for MAP of the infrastructure manager in the HR, which was finalised in the first quarter of 2024. The charge for MAP makes up the most important item in HŽI's revenues. In addition to the RA and the ARSM, the manner in which the charge is calculated is laid down by Directive 2012/34/EU establishing a single European railway area and Commission Implementing Regulation (EU) 2015/909 on the modalities for the calculation of the cost that is directly incurred as a result of operating the train service. The primary objective of this project was to analyse whether statutory provisions and the provisions of the said Directive and Regulation were correctly implemented and to ensure that the charges for MAP and access to branch lines are set at the level of the cost directly incurred as a result of operating the rail service, as well as that the service is provided to all railway undertakings in a non-discriminatory manner.

REVENUES AND CHARGES OF INFRASTRUCTURE MANAGER – HŽI

The charges for rail services collected by the HŽI are related to MAP, access to service facilities and services provided at those facilities, including track access to those service facilities and additional and auxiliary services. For the use of MAP and track access to service facilities railway undertakings sign an Access Agreement with the HŽI, while separate agreements are concluded for other railway services.

HŽI is independent in defining the methodology for setting charges. It publishes the terms and conditions and the prices for other railway services in the NS, in accordance with the provisions of the RA. HŽI and service facilities operators are independent in calculating the price for access and usage of railway services, while HAKOM's role is to supervise the infrastructure manager and service facilities operators in relation to the setting of and the amount of these charges, as well as to check whether they are calculated in accordance with the provisions of the RA and the methodology and rules of the NS. In addition, HAKOM is authorised to supervise negotiations between the applicants and infrastructure manager regarding the amount of charges for railway services for the purpose of just and non-discriminatory access to the use of these services. In 2023, HŽI generated EUR 17.6m in revenues from all railway services, 6 percent less than in 2022.

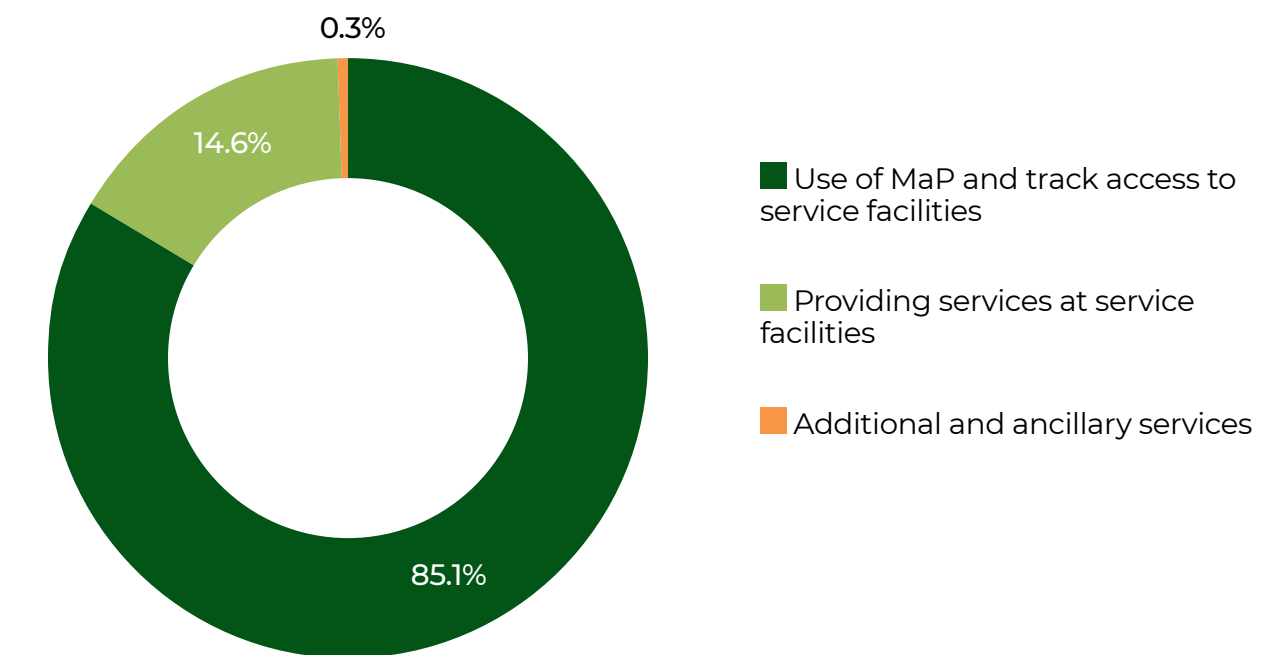
Figure 4.10 HŽI revenues from railway services (in EUR)



Of the total amount of revenues generated from railway services, approximately EUR 15m or 85 percent were generated by MAP.

² Ostvareni prihodi za razdoblje od 2019 do 2022 prikazani su tako da su se iznosi koji su bili iskazivani u HRK podijelili s fiksnim tečajem od 7,5345 HRK za jedan EUR.

Figure 4.11 Shares in revenues by type of HŽI rail services



REGULATORY ACTIVITIES

Infrastructure manager's Network Statement

Pursuant to its competence in the segment of regulating the rail services market, HAKOM continuously checks the content of the NS and in the draft phase of the document analyses the content and compliance with regulations and notifies the infrastructure manager on possible necessary amendments to disputed provisions. In addition to the relevant 2023 NS, HAKOM monitored and reviewed the amendments to the 2024 NS and the 2025 NS. For the purpose of increasing the transparency of the data available in the NS regarding the 2024/2025 timetable and based on the activities carried out by the EC in the legislative segment regarding the adoption of new regulations, HAKOM sent to HŽI queries regarding the drafting and the implementation of the plan of infrastructure capacity allocation in order for the infrastructure manager to get ready and without delay implement the new model as at the day it comes into force.

Back in 2022, HAKOM established amendments to the 2024 NS relating to the methodology for the calculation of the minimum access package and charges for the minimum access package in the part related to the changes in the equivalent of weight category, line parameters, train path equivalent in passenger and equivalent of weight in freight transport, which led to a 15 percent increase in the basic price of the minimum access package from the 2023 NS.

In the first amendments to the 2024 NS the infrastructure manager announced the introduction and implementation of the new model of charging electricity required for towing trains as of 1 December 2024. In the second amendments to the 2024 NS the infrastructure manager went on to announce the increase in the prices of services in service facilities under its management and those where it provides railway related services, by an average 57 percent from the 2023 NS.

In 2023, based on the facts established in 2022 and pertaining to the initiated analysis of the operators of service facilities, i.e. their obligations under Article 25, paragraph (1) of the RA regarding the submission of the description of service facilities to HŽI to be published in the 2024 NS, HAKOM initiated and completed inspection supervisions over existing service facilities operators (18), establishing the emergence of new service facilities operators (11) in the rail services market.

Providing a non-binding opinion on HŽI Infrastruktura d.o.o. Draft 2023 Business Plan

Pursuant to the RA, the infrastructure manager is obligated to adopt a business plan by the end of February of the year to which the plan pertains, at the latest. It is also obligated, prior to adopting the business plan, to ensure existing applicants, and upon request, potential applicants, access to relevant data, as well as to give them the opportunity to express their opinion in connection with the conditions for access and utilization as well as with the efficiency, availability and development of the railway infrastructure. The draft business plan with the opinions of existing, or potential, applicants, must be delivered to HAKOM, which gives a non-binding opinion.

HAKOM analysed the plan and in its non-binding opinion concluded that, in essence, the draft business plan was prepared in a detailed and comprehensive manner and that it contained all the parts that a plan of a company of HŽI's size and importance should contain. A particularly important and meticulously drafted part of the plan is related to financial projections for investments, containing useful information, not only for HŽI but also for all stakeholders involved in the rail sector in any way whatsoever. The introductory part presents key data and the summed amounts of all planned investment activities in 2023, including the data on amounts planned for to be drawn from EU funds and the amounts (shares) showing how much from the totally planned investments relates to the restoration and modernisation of the existing railway infrastructure and how much to the projects of laying new tracks.

HAKOM underlined the exceptional financial and the general economic importance of investment projects and the need for planning feasible projects and amounts because of their impact on traffic and the quality of the transport services.

Organising round tables

Aiming at increasing the recognisability of its role in the rail services market, HAKOM, in cooperation with the Croatian Railway Safety Agency and the Air, Maritime and Rail Transport Accident Investigation Agency, organised two conferences in 2023, carefully selecting topics relating to the problems faced by stakeholders in the rail services markets of neighbouring countries and aiming to exchange good practice and experiences. The conferences gathered representatives of the MSTI, the organisers, infrastructure manager, railway undertakings, service facilities and the academia.

The 15th conference held in succession was entitled 10 Years of the Liberalised Rail Transport Market in Croatia. The HR as the fully-fledged Member State of the EU is committed to the key objectives of the EU's transport policy by fostering competitive relations aimed at contributing to the developing of a single integrated EU rail market. The liberalisation of the HR market marked a new era in the rail sector, the opening of the market and a break with the monopolistic market model. In 2013 the first new rail freight undertakings were registered in the HR. The aim of the conference was to analyse how the market developed in the decade after liberalisation and recognise the needs for further system improvements. Railway undertakings, as well as other market stakeholders, were given the opportunity to list the advantages and the shortcomings they face in their daily operations at a panel discussion.

The quality of the railway infrastructure is an important element in the development of the railway system. The parameters of infrastructure quality and their impact on development, and the current situation was the topic of HAKOM's 16th conference entitled Impact of Infrastructure Quality on Railway Transport. The objective of the discussion was to assess the current state of the railway infrastructure in the HR, how much it is invested in its development, what challenges the users of the railway infrastructure face and how their operations are impacted by track closures and slower train speeds caused by network maintenance and modernization works. The panel discussion was preceded by presentations of the organisers and freight undertakings, and the representatives of the neighbouring countries sharing their experiences. At the event, HAKOM held a bilateral meeting with the representatives of the Macedonian regulatory authority attending the conference.

Analysis of regulatory financial statements (RFS)

To prevent the infrastructure manager, service facilities operators or rail carriers to possibly disrupt market competition, especially through excessive and/or discriminatory charges for rail infrastructure access, unequal realisation of access rights, mutual subsidies, excessive and/or

discriminatory prices of additional or auxiliary services, HAKOM undertook all the necessary monitoring measures, including verifying compliance with the provisions on accounting separation. HAKOM uses the RFS to regularly collect financial data from the infrastructure manager, required to get the picture of the competitiveness in the rail services market, primarily for the monitoring and control of the structure and the level of charges for access to the railway infrastructure. In 2023, HAKOM received RFSs of all the undertakings required to submit them, with all of the statements complying with the prescribed submission instructions and deadlines.

Regulatory dispute regarding the requests of undertakings for a reduction of charges for the minimum access package for freight trains

In September 2022, HAKOM received a request by the rail undertaking ENNA TRANSPORT d.o.o. in connection to the services and charges of HŽI pursuant to Article 15 of ARSM. It applied for a reduction of the charges for the minimum access package for freight trains, in relation to which, in the opinion of the undertaking, the equivalent of weight category of the train path in freight traffic, the basic price per train-kilometre, as well as line parameters of individual tracks needed to be revised downward, as well as the charges for capacity/non-usage of allocated train paths for the relevant timetable in force and future timetables until the state of the infrastructure is brought up to the satisfactory level. In addition, it requested for a system of service quality indicators to be put in place, as well as a special system of resolving disputes in accordance with Article 51 and Annex 5, item 9 (g) of the RA.

Based on a thorough analysis of all relevant factors, HAKOM adopted a decision in April 2023, partly granting the request of the railway undertaking, by which it ordered HŽI to specify in detail and put in place a system of service quality indicators, in accordance with Article 51 of the RA, for all railway freight undertakings, as well to introduce a special system of resolving disputes connected with the system of quality indicators for all railway freight undertakings, in accordance with Annex 5, item 9 (g) of the RA, starting from the entry into force of the 2023/2024 timetable. HŽI was obligated to publish the above request in its NS. The remaining part of the request by the railway undertaking was rejected as unfounded.

In November 2023; HŽI notified HAKOM of the decision of 17 November 2023 of its Management Board to amend the 2024 NS, amending item 5.7. so as to describe the transport quality system for all railway undertakings. The same item specified the system of resolving disputes connected with the system of quality indicators and the decision entered into force on the same day. The same notification stipulated that because of the inexistence of the application for the system of

quality indicators they were unable to calculate the charges for train delays since the entry into force of the 2023/2024 timetable and that after the application was completed, they would retroactively collect charges in accordance with the notification. HAKOM will continue to monitor the execution of the decision in its full scope in 2024.

A decade of the railway freight transport liberalisation

When the HR joined the EU its railway freight transport market was liberalised. To mark the ten-year anniversary, HAKOM analysed the work of railway undertakings in the railway market of the HR and traffic and financial indicators.

By joining the market, new freight undertakings helped create a market for railway freight transport. They started their first transport activities in 2014 in the market which until then only had one incumbent freight undertaking. A more significant increase in the operation of new undertakings occurred five years after the formal liberalisation of the market. In the period from 2015 to 2021, new railway freight undertakings almost equalised their share in realised net tonnes and train-kilometres with the incumbent undertaking, while in the total tonnes of transported goods they accounted for over 60 percent of the market share. In 2019, the share of realised train-kilometres of new undertakings in the HR reached the EU average.

The considerable upward trend in the growth of the market of railway freight transport caused by the entry of new railway freight undertakings to the market was a consequence of the market opening and of the created market opportunities being recognised. The liberalisation of the market created the preconditions for new services and new stakeholders, which ultimately led to market competition and the improvement in quality. The number of new railway freight undertakings has been gradually growing, the market has been expanding through new service and the workload of new undertakings has been rising, which has been a positive improvement in a small transport market such as the Croatian market and an indicator of the positive impact of liberalisation on market development.

INSPECTION ACTIVITIES

In 2023, the inspectors for the regulation of the railway services market and the protection of the rights of passengers in rail transport carried out a total of 22 inspection supervisions, of which 18 over the service facilities operators and the remaining number over railway undertakings and the infrastructure manager.

Inspection supervision was carried out over HŽI with regard to the obligations of the infrastructure manager under the Ordinance on timetables in railway transport pertaining to the preparation and publication of train timetable excerpts for passengers at train stations and stops, aiming to accurately and timely inform passengers. Inspections were conducted of 61 train stations and stops. Pursuant to inspection decisions the supervised entity put into place and computerised its business process thus achieving a high level of information accuracy of timetable excerpts for passengers and consequently raising the quality of information provided to passengers at train stations and stops regarding train timetables.

Service facilities operators were subjects of altogether 18 inspection supervisions, which included descriptions of service facilities, their compliance and public disclosure in accordance with the provisions of Articles 4 and 5 of the Commission Implementing Regulation (EU) 2017/2177. Inspection supervisions identified 9 new service facilities. In November 2023, HAKOM organised a workshop for operators of service facilities at which operators of service facilities were informed of their obligations. In addition, it prepared and published a document under the title Guidelines for the preparation of the description of service facilities, which identified the needs and obligations of the stakeholders in the rail services market and presented useful information illustrated by real life examples. The objective of the document is to aid the operators of service facilities in creating detailed descriptions of service facilities and to aid potential applicants to better understand the work of service facilities operators, as well as facilitate a better utilisation of service facilities. It presents different national approaches, especially for those countries in which legislation mandates special procedures for the adoption of the description of service facilities.

05

RF SPECTRUM MANAGEMENT



RF SPECTRUM MANAGEMENT

The Electronic Communications Act recognises RF spectrum management and use as one of naturally limited resources of interest to the Republic of Croatia, and its efficient management as one of HAKOM's main tasks. When performing its task of RF spectrum management, HAKOM carries out the procedures of determining spectrum use, creating allocation plans, frequency plans and defining network technical parameters, issuing licences and approvals for the RF spectrum use and spectrum control and monitoring on the national and international level, thereby adhering to the principles of objectivity, transparency, competitiveness, proportionality and non-discrimination. The RF spectrum as a limited natural resource is of interest and of great importance for the development of electronic communications, with wireless broadband networks being expected to provide an irreplaceable contribution to the development of all branches of the industry and economy and to digital society. The RF spectrum use in the HR is internationally co-

ordinated in accordance with the regulations of the ITU, CEPT and international implementation treaties, and is additionally harmonised among EU Member states and neighbouring countries. The RF spectrum management and control ensure a smooth operation of radiocommunication services and indirectly the safety of human life and the protection of health and property.

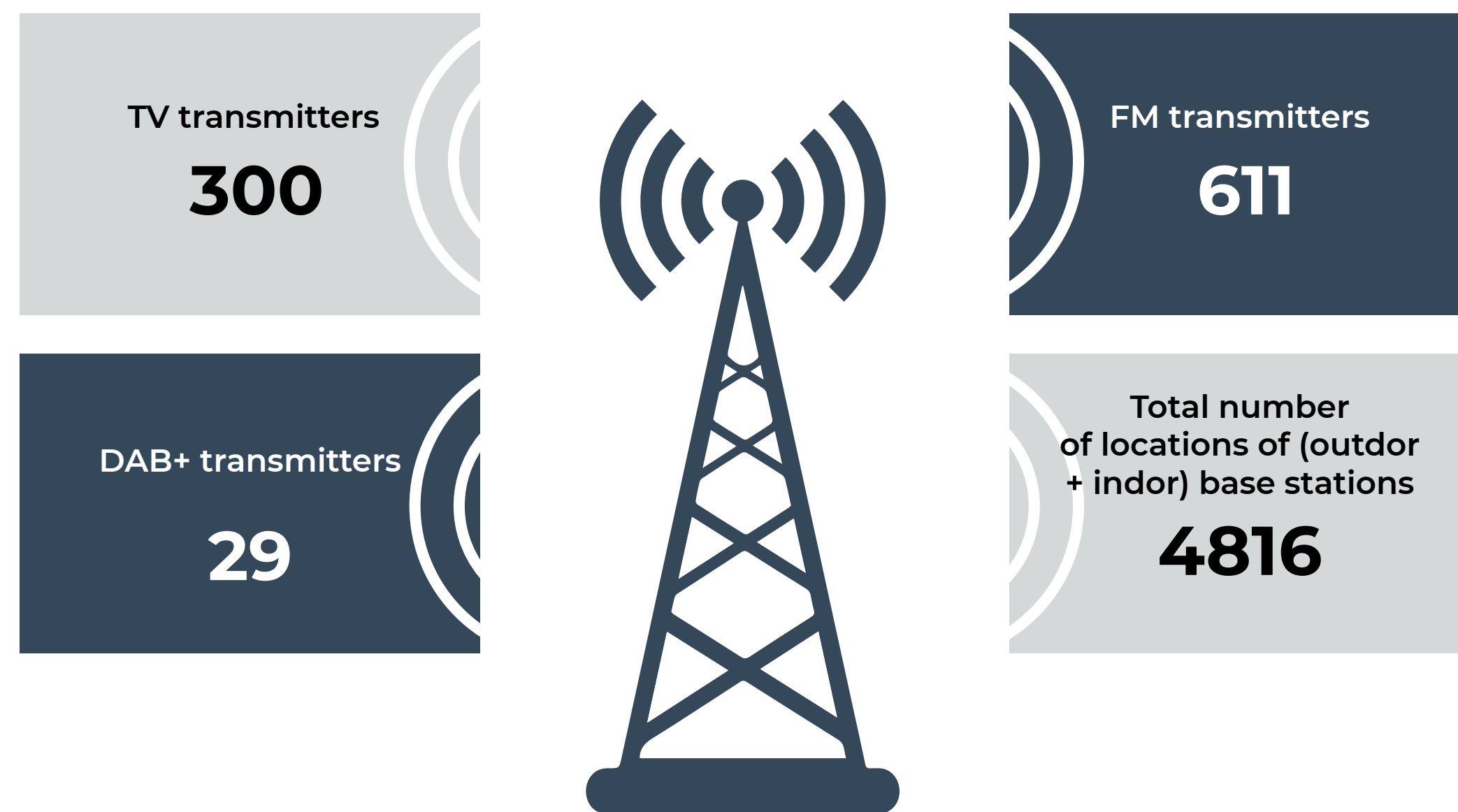
EFFECTIVE USE OF THE RF SPECTRUM

As a result of monitoring technological developments and the needs of RF spectrum users and keeping an eye on the effective use of the RF spectrum, HAKOM prepared and proposed to the MSTI amendments to the Radiofrequency Allocation Table in 2023, which lays down the purpose of radiofrequency bands for radiocommunication services in accordance with the Radio Regulations of the International Telecommunication Union (ITU), so that the MSTI adopted a new Ordinance on the allocation of the radiofrequency spectrum.

In 2023, the European Commission presented to the Member States a project of the joint European satellite network in low earth, medium earth and geostationary orbit – IRIS2 (Infrastructure for Resilience, Interconnectivity and Security by Satellite) and proposed that the agreement entitled Union Secure Connectivity Programme (USC) be signed. The agreement is related to EU's plans to deploy its satellite megaconstellation (modelled after the US SpaceX StarLink and similar constellations), which should primarily enable a safe connectivity link among the Member States and in the next stages of its realisation have a commercial component, thus catering to the communication needs of EU's enterprises. At HAKOM's initiative, and in cooperation with other Croatian authorities competent for individual elements of space and satellite research and use, the HR formed a stance to support and join the said Agreement. The MSTI authorised HAKOM to sign the Agreement on behalf of the Republic of Croatia, which was executed on 9 October 2023. The Agreement entered into force on 13 January 2024, a month after the first nine Member States of the EU signed it.

In June 2023, HAKOM organised the G Day conference, which, this time, focused on satellite communications and the launching of Croatia's first satellite into orbit. The objective of the conference was to spur Croatia's technological development and provide for a development of an advanced and prosperous, innovation-based society, but also to popularise astronomy and space programs and strengthen STEM sciences and high-technology entrepreneurship. The Cro-Cube and FERSat projects which plan the launching of their satellites into orbit were presented. Hrvatski Telekom presented the testing of NTN networks (non-terrestrial networks) completed in the HR and the challenges of integrating satellite networks into existing terrestrial networks,

Figure 5.1 Basic data on radio stations



which is especially important in crisis situations and when faced with security challenges. The European Union Agency for the Space Programme (EUSPA) presented the new European infrastructure for resilience, interconnectivity and security by satellite – project IRIS, while HAKOM presented an overview of satellite communications and the international regulatory framework for satellite communications. The conference was concluded by a panel discussion on the purpose of satellites, scientific contribution from satellite launching and how the industry views the development of satellite communications.

In July 2023, HAKOM launched the upgraded version of its application e-Licences. In addition to existing functionalities (e-Microwave, e-Vessels and e-Broadcasting), it provides online application for all other licences for the use of the RF spectrum (e-Fixed, e-Mobile, e-Satellite, e-aeronautical, e-Amateur) and authorisations (e-Microwave link authorisation, e-Fixed authorisation and e-Mobile authorisation).

The upgraded version of the e-Licences application features a series of improvements and new features that make the process easier for users, as well as speed up the licencing/authorisation process for the use of the RF spectrum. In addition to providing the service of submitting the application for licence, the e-Licences application was upgraded in such a way to offer the possibility of submitting applications for: extension, amendments to or revocation of licences/authorisations. In addition to submitting individual applications, for some types of licences it is possible to submit a group application. This option provides for the possibility of submitting multiple applications at the same time, which considerably saves time and makes the procedure required for obtaining multiple licences easier. All these functionalities increase the flexibility, accessibility and efficiency of services HAKOM provides to the users of the RF spectrum. In addition to the above and by introducing the electronic signature and adjusting the existing licence,

HAKOM provided for the licence for the use of the RF spectrum to be issued in electronic form in the amateur service. This also enabled the remaining types of licences to be issued electronically and made it easier for Croatian radio-amateurs to travel and work in the HR and neighbouring countries without requiring a paper version of the licence.

Within the scope of its regular activities of RF spectrum management, HAKOM issues licences for the RF spectrum use, approvals for services of particular importance and compliance certificates to radio stations, and, in accordance with the Ordinance on fiscalisation in cash transactions, certificates confirming inability to establish an internet connection to exchange data with the Ministry of Finance and the Tax Authority. It is noteworthy here that the users of the RF spectrum recognised and welcomed all of the advantages offered by the upgraded e-Licences system and that from its release into operation in July until the end of the year some 90 percent of licences were issued electronically.

WORLD RADIOCOMMUNICATION CONFERENCE (WRC)

Regarding HAKOM's international activities, 2023 was marked by the World Radiocommunication Conference (WRC-23). Every four years the ITU organises the World Radiocommunication Conferences where it decides on the topics on the agenda and where it strives to reconcile different economic and political interests of different countries and industries, which need the use of radiofrequency or satellite orbits for their operation. The objective is to harmonise the future use of radiofrequency at the widest possible geographic area, that is in one or more ITU regions to which the world is divided.

The WRC-23 was held in Dubai, in the United Arab Emirates, from 20 November to 15 December and was preceded by a series of preparatory meetings at the regional EU level (meetings of CEPT Conference Preparatory Group (CPG) and its project teams), but also at the global level (meetings of ITU-R working groups and the second WRC preparatory meeting, the Conference Preparatory Meeting (CPM)). For HAKOM, the presenter of the agenda item 7, topic E from the area of satellite resources management, the preparations included a series of preparatory meetings with regulatory authorities of predominantly neighbouring countries (Bosnia and Herzegovina, Northern Macedonia, Serbia, but also Moldavia and Georgia).

The already mentioned, and very important for HAKOM and the HR, the agenda item (AI) 7 of the World Radiocommunication Conference is a regular item at all conferences, as was the case at the last WRC-23, within the scope of which regulatory procedures were deliberated related to the management of frequency and orbital resources in satellite communications. However, at

Figure 5.1 RF spectrum management – documents issued

Type of documents issued	Quantity
RF spectrum use licences	5,523
Approvals for services of particular importance	8
Compliance certificates	6,530
Fiscalisation certificates	2

this conference, within topic E (AI 7E), it was particularly important for HAKOM to secure Croatia's new rights to orbital and frequency resources in the Fixed-Satellite Service Plan. Namely, under the said Plan Croatia shared the rights with successor states to the former Yugoslavia, that is the allotment¹⁷ rights marked XYU0000. Considering the uniqueness of the geostationary orbit (GSO), the possibility of acquiring new positions and frequency resources is very limited and subject to time consuming and complex coordination agreements with other planned or existing satellite networks. Therefore, the procedure for initiating amendments to the ITU-R Radio Regulations, Annex 30B was initiated with seven other countries, with the objective of making the coordination procedure easier for countries without rights in the Fixed-Satellite Service Plan. The outcome of the WRC-23 was favourable for the HR since the proposed amendments were, to a great extent, accepted. Simultaneously, and within the same topic, the right was attained for early assignment in the Plan (GSO, Fixed-Satellite Service, position 63°E, frequency resources in C and Ku bands) without the coordination proceedings being fully completed.

In addition to the AI 7E, the following WRC-23 topics (AI) were important for Croatia.

As regards the topic 1.2 (AI 1.2), relating to the identification of the 3300-3400 MHz band (in region 1 and 2), 3600-3800 MHz band (region 2), 6425-7025 MHz band (region 1), 7025-7125 MHz band (globally) and 10-10.5 GHz band (region 2) for the IMT (International Mobile Telecommunications), the issue of the identification of the 6425-7025 and 7025-7125 MHz bands was especially important for the IMT. Within these bands some countries already decided to allocate this spectrum for non-licensed use such as WAS/RLAN (Wireless Access Systems / Radio Local Area Network) and it was also necessary to ensure the protection of fixed-satellite links (FSS). In a large number of countries, the specified bands are also used for microwave links. The outcome of the WRC-23 was also the identification of the 6425-7025 MHz band in region 1 (Europe, Africa and Russia) and in several other countries in ITU regions 2 and 3, and the 7025-7125 MHz band in the ITU regions 1 and 3 (Asia, Australia and the Pacific) for the IMT. However, it remains to be seen what European and EU countries will decide as regards the use of bands at the local level. In any case, the identification of the said bands for the IMT provides a strong message to the mobile industry that there is the possibility of these bands being harmonised in the large part of the globe and to work more intensively on the development of the equipment for these bands.

Topic 1.5 (AI 1.5) dealt with the analysis of the existing use of the 470-960 MHz frequency band, the future needs for this spectrum and the deliberation of the future use of the 470-694 MHz band for mobile services. The outcome of the WRC-23 regarding this topic was fairly harmonised with the European Common Proposal (ECP) with which Europe came to this WRC-23: the 470-694 MHz band is dedicated to mobile services on a secondary basis indicating the direction of the development of the use of this band after 2031. Namely, an agenda item for the WRC31 was agreed at the WRC-23 where the possible upgrade of mobile services to a primary allocation in

the said frequency band will be discussed. Until then, at least, the band will, in most European countries, be used for TV radio broadcast, as has been intensively used since the very emergence of this technology. The outcome of the WRC-23 is also the primary allocation of the 470-694 MHz band for mobile service in Arab countries and the realisation that African countries and Russia are strictly opposed to any other use and purpose of this band, so that only a small number of African countries attending the WRC-23 allocated the 614-694 MHz sub-band to mobile service on a secondary basis.

The agenda item 10 (AI 10), related to specifying the items on the agenda for the next World Radiocommunication Conferences (WRC27 and WRC31), resulted in defining a series of topics from all segments of radiocommunications, from lunar communications to deliberating a series of bands for potential identification for the IMT. It is precisely this topic that is especially important for Europe and the Republic of Croatia because studies in the upcoming period will analyse the possibility of the use of the 4400-4800 MHz, 7125-7250 MHz and 7725-8400 MHz bands for the IMT, which, considering the existing users of these bands is not something that meets the European and Croatian needs. Therefore, the stress will be placed on defining technical and regulatory measures aimed at protecting the existing services in the specified bands.

PUBLIC MOBILE COMMUNICATION NETWORKS

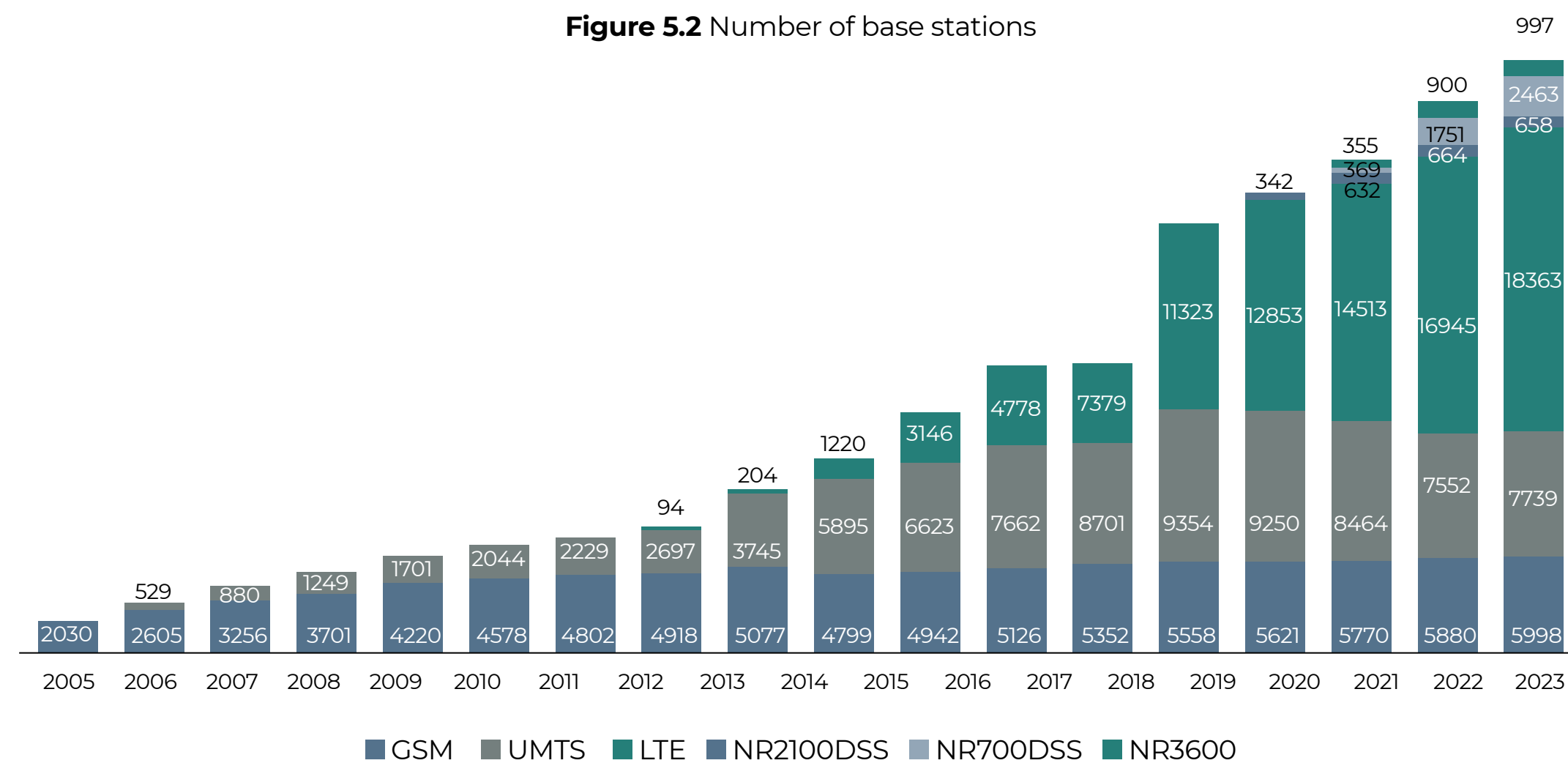
In 2023, HAKOM completed the allocation of the radiofrequency spectrum for mobile communication networks in the 800 MHz (791-821/832-862 MHz), 900 MHz (880-915 MHz/925-960 MHz), 1800 MHz (1710-1785/1805-1880 MHz), 2100 MHz (1920-1980/2110-2170 MHz), 2600 MHz (2500-2570/2620-2690 MHz) frequency bands at the national level and the 3600 MHz (3400-3480 MHz) frequency band at the regional level, as reported in detail in the 2022 Annual Activity Report.

The electronic bidding procedure started on 16 January 2023 and lasted six weeks, leading to the adoption of the decision on the selection of the most favourable bidder on 8 March 2023. The licences were issued for a period of 15 years with a possibility of extension of 5 years at the most. At the national level the radiofrequency spectrum was allocated to existing operators: AI Hrvatska, Hrvatski Telekom and Telemach Hrvatska, while at the regional level the spectrum was allocated to the operators Digicom d.o.o. for the Brod-Posavina County, Krapina-Zagorje County and the City of Zagreb and to Markoja d.o.o. for the Bjelovar-Bilogora County, Karlovac County, Lika-Senj County, Osijek-Baranja County, Požega-Slavonia County and Virovitica-Podravina County. The total amount of fees collected for the right to use the RF spectrum at the national and the regional level realised at the public auction was EUR 339,186,745.00. The fees collected via the auction are in their full amount revenues of the state budget.

¹⁷ Allotment is the expert term for the area for which the individual frequency resource is allocated.

As at 31 December 2023, the three operators at the national level reported 4,118 5G base stations (including the NR700DSS, NR2100DSS and NR3600 technology), and reported to the EC the following 2023 coverage data: 83.4 percent of the total number of households and 80.1 percent of households in rural areas. HT announced the gradual discontinuation of the operation of 3G networks, enabling the transition to newer technologies such as the 4G and 5G, which will increase the efficiency of the usage of the part of the spectrum available to mobile operators.

Figure 5.2 Number of base stations



At the end of 2022, HAKOM received the comments of several licence holders for the 3600 MHz frequency band at the regional level, stipulating the need for the extension of the time limit for putting into operation at least one base station. As legitimate grounds for the extension of the time limit for meeting the obligation of putting into operation at least one base station, HAKOM allowed unstable economic and political developments and consequences of the COVID crisis that caused delays in the delivery of the necessary equipment, and certain administrative procedures at the local self-government level. Public consultations were held regarding the extension of the time limit, following which the final time limit for putting into operation at least one base station by licence holders for the use of the 3600 MHz frequency band at the regional level was extended to 12 August 2023.

In 2023, as part of carrying out activities pursuant to the National Plan for Broadband Development 2021-2027, HAKOM, in cooperation with the Ministry of Health and the Teaching Institute of Public Health, *Dr. Andrija Štampar*, agreed to hold public discussions in 2024 on the topic of electromagnetic fields (EMF). In addition, for the purpose of informing the general public, it was agreed that infographics and animations on EMFs and their impact on human health be prepared and then publicly presented in 2024.

In September 2023, HAKOM participated at the 20th REGFEST conference Current and Future Regulatory Challenges, Harmonisation with the European Regulatory Framework in Budva, Montenegro, organised by the Montenegro regulatory authority, EKIP, in cooperation with the International Telecommunications Union (ITU). In addition to participating in the event, HAKOM signed the following international agreements:

- the bilateral coordination agreement with EKIP for the 900 MHz, 1800 MHz, 2100 MHz and 2.6 GHz bands;
- the multilateral coordination agreement for the 3.6 GHz band with the regulatory authorities of Albania (AKEP), Bosnia and Herzegovina (RAK), Montenegro (EKIP), Serbia (RATEL) and Northern Macedonia (AEC).

PRIVATE MOBILE COMMUNICATIONS NETWORKS

As regards mobile communications networks, a total of 1,258 licences were issued for fixed stations and 802 licences for movable stations. All new networks are used in the digital mode, while the existing analogue networks are gradually transitioning to digital technology.

The Croatian Firefighters Association still uses the analogue repeaters in the 136-174 MHz frequency band. A decision on the unified firefighters' network at the level of the Croatian Firefighters Association has still not been adopted.

In 2023, intensive cooperation with the Ministry of Defence continued, which was characterised by the increased scope of issued necessary authorisations for the use of the RF spectrum by the Ministry of Defence and for the purposes of NATO forces. Coordination meetings were held in connection to the elimination of radar interferences and compliance with NATO regulations.

The international frequency coordination for the operation of private mobile communication networks with Slovenia, Austria and Hungary continued, the countries the Republic of Croatia has signed coordination agreements with.

Building on the previously adopted amendments to the Ordinance on payment of fees for right to use addresses, numbers and radio frequency spectrum, and following public consultations, in 2023, HAKOM amended the Ordinance on conditions of assignment and use of radio frequency spectrum, the Ordinance on special conditions for installation and use of radio stations, the Ordinance on payment of fees for carrying out of tasks of the Croatian Regulatory Authority for Network Industries and the Allocation Plan for the 2500-2690 MHz frequency band, thus providing for the issuing of licences and payment of relevant fees for private broadband networks. In order to enable a broader implementation of this type of networks and additionally spur industrial and economic developments, the fees were set so as to be affordable to all potential users (from small geographic areas for e.g. industrial halls, ports etc. to large ones - the energy industry, agriculture, forestry, etc.). It is currently possible to use the 2575-2615 MHz frequency band, while other frequency bands (for instance, the 3.8-4.2 GHz band) for this purpose will be introduced depending on technological developments and the results of studies at the European level. Interest was expressed in 2022 and 2023 for the implementation of these types of networks, which was facilitated by the earlier mentioned regulatory amendments. The issuance of first licences, as well as the actual implementation, are expected at the beginning of 2024.

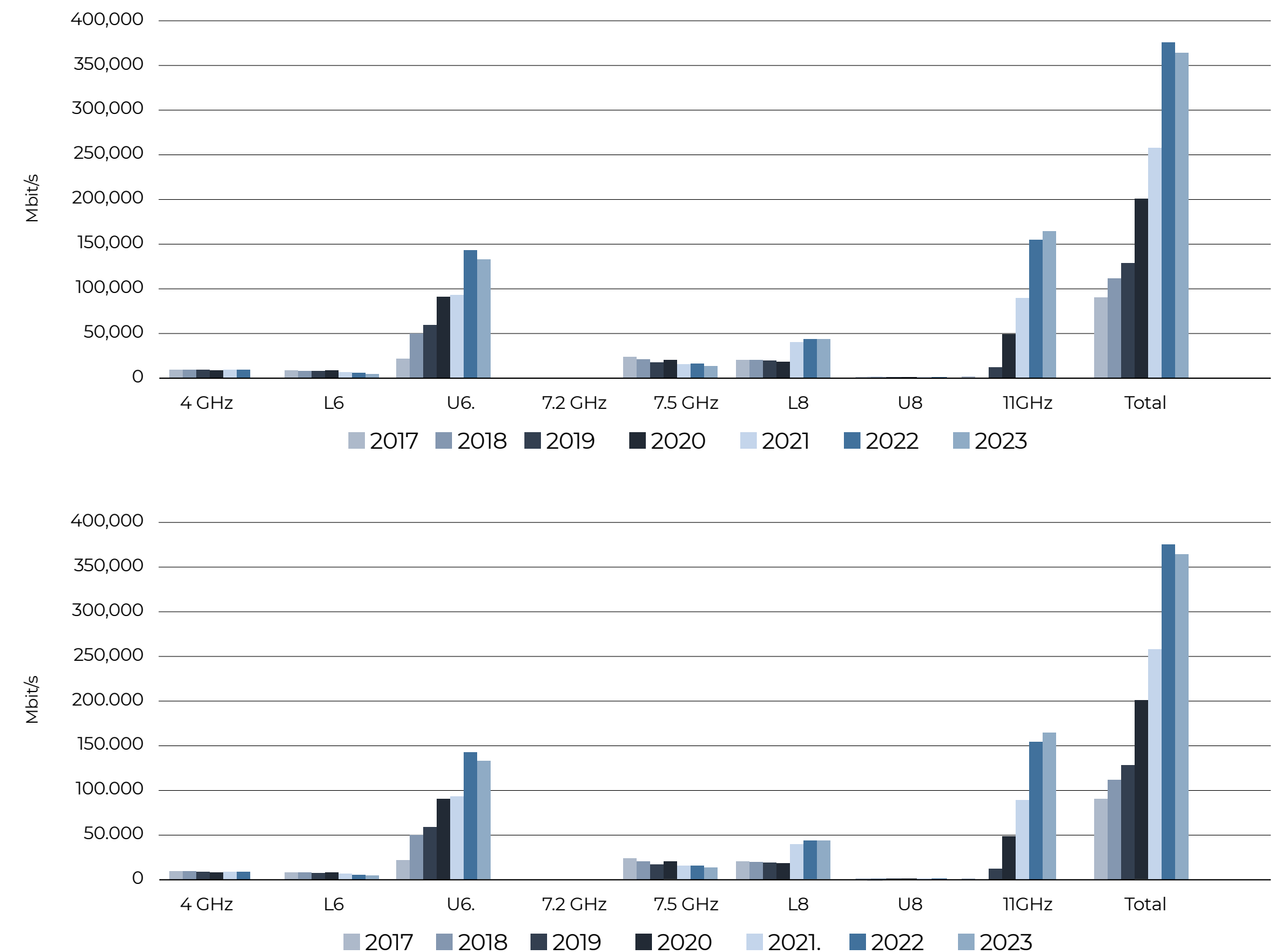
MICROWAVE AND SATELLITE NETWORKS

Adhering to the principle of the effective use of the RF spectrum, within the framework of its regular activities, HAKOM carried out frequency planning and international coordination of microwave links in accordance with the provisions of the HCM Agreement, thus ensuring the uninterrupted operation of microwave links in the territory of the HR and in international environment.

A total of 1,136 licences and 2 authorisations for microwave links were issued in 2023. Of which, 334 were for new links, 195 were licences for amendments in technical parameters of existing links (predominantly relating to the increase in transfer capacity of the operator of mobile communication network) and 607 were for the extension of the validity of existing links. The total number of active microwave links at the end of 2023 was 4,892, which was 4.4 percent less than at the end of 2022. This was partly a result of the increase in the width of the channel for microwave links and the increase in locations at which optical infrastructure was available.

Despite the decrease in the total number of microwave links, the upward trend in the total transfer capacity of microwave links continued, increasing by slightly less than 3.5 percent from the previous year. This was a result of further upgrades to mobile communication networks and the

Figure 5.3 Transmission capacity of microwave links over the years



need for ensuring continuously increasing transfer capacity to end-users. This trend is expected to continue in the coming years, with additional requests for the increase in transfer capacity of microwave links being expected due to greater usage of 5G networks. The growth in the transmission capacity in the 11 GHz, 18 GHz, 23 GHz and 70/80 GHz frequency bands was noticeable, paired with a stagnation in the lower 8 GHz (L8), upper 8 GHz (U8) and 28 GHz frequency bands, and a fall in the lower 6 GHz (L6), upper 6 GHz (U6), 7.2 GHz, 7.5 GHz, 13 GHz and 38 GHz frequency bands, while there are no more active microwave links in the 4 GHz frequency band.

The links from the 4 GHz frequency band relocated to the lower 8 GHz (L8) frequency band, as is visible from the increase in the number of links and transfer capacity in that frequency band during the respective period. The upward trend in transfer capacity in the 11 GHz frequency band continued, however, at a much slower pace than over the previous year (rise of 6.4 percent from the end of 2022). This frequency band continues to be the alternative to the 13 GHz frequency band which was saturated in certain locations and was marked by a lack of available radio channels for the realisation of requested transfer capacities. This was also reflected in a further decline in transfer capacity in the 13 GHz frequency band, which is currently at slightly lower levels from those registered at the end of 2019. Further decline in the number of links and transfer capacity was also noticeable in the 38 GHz frequency band, used predominantly to connect base stations in mobile communication networks at distances shorter than 3 kilometres. This is caused by increasingly more intensive use of the 70/80 GHz frequency band (transfer capacity increasing by almost 14 percent from the previous year), which at similar distances may offer connections of several times higher transfer capacities than the 38 GHz frequency band, and by the simplified licencing procedure and the significantly lower cost of obtaining the licence. The average transfer capacity of digital microwave links in 2023 was 540 Mbit/s, which was an increase by more than 8 percent from the previous year.

Within the framework of the international coordination of radio frequencies and pursuant to the HCM Agreement for fixed service, the frequency register of all active microwave links was sent to all countries that are the signatories of the HCM Agreement in the coordination zone.

As part of its regular activities, HAKOM processed requests for satellite link licences and applications for the installation of radio stations in the satellite service (operating on the basis of issued general licences). In 2023, one licence was issued for an amateur radio station for the use of RF spectrum in amateur satellite service. The received coordination requests for satellite networks were analysed and processed in accordance with the ITU procedures.

Activities related to the launching of the first Croatian nanosatellite into the LEO¹⁸ orbit intensified in 2023. On 26 September 2023, HAKOM, via the ITU internet application e-Submission submitted information for the Advance Publication Information (API), thus for the first time initiating the implementation of international prescribed procedures for the entry of a satellite network in the Master International Frequency Register (MIFR) with the ITU. ITU's Radiocommunications Bureau (ITU BR) published the technical information of the first Croatian satellite network CROCUBE in its BR International Frequency Information Circular (Space Services) (BR IFIC) No 3009 of 14 November 2023. The CROCUBE satellite network will use for its operation frequencies dedicated to amateur satellite service, the use of which was approved by the International Amateur Radio Union (IARU). Considering that the launching of the CROCUBE satellite network is foreseen for 2024, HAKOM is expected to complete the entry of the network in the MIFR in 2024.

18 LEO (Low Earth Orbit) – satellite orbit that is close to Earth's surface

RADIO AND TELEVISION NETWORKS

Work on the planning and optimisation of analogue radio networks in the 87.5-108 MHz (FM) frequency bands continued in 2023, as well as on the international harmonisation of technical parameters of radio stations. There were altogether 155 analogue radio networks (FM) operating in the HR at the end of 2023: 11 public (HRT: 3 at state and 8 at regional level) and 144 commercial. In comparison to previous years, there is still interest for launching new radio stations and improving the quality of coverage by existing radio stations. Due to the unwavering interest, a series of technical analyses was conducted in order to, given the congestion of the radiofrequency spectrum, determine the possibilities for approval of new requests. In addition, HAKOM prepared and submitted to the Agency for Electronic Media (AEM) the technical parameters for opening a public tender for extending 13 FM concessions for performing the activity of providing the media service of radio, and the technical parameters for the extension of the coverage for the 4 existing concessions. The AEM was also regularly submitted notifications on amendments to technical parameters of existing radio stations, as well as submitted responses to queries on the existence of technical conditions for awarding new concessions in individual areas.

There were no significant changes in the UHF TV frequency area. The 4 terrestrial digital television networks with national coverage and 2 networks with coverage at the local level continued their operation. All national and local free-to-air networks pursuant to the 2019 Licence for the use of the radiofrequency spectrum for the provision of the service of managing 3 electronic communication networks of digital television, for multiplexes M1 and M2 in the territory of the Republic of Croatia and for L1 in local areas, transmit DVB-T2 H.265/HEVC encoded signal in HD quality. In accordance with the terms of the licence, the holder of the licence following 36 months from the issuance of the licence may once a year amend prices in accordance with changes to the average annual index of consumer prices published by the Croatian Bureau of Statistics, with prior notification to HAKOM. Consequently, the licence holder, the company Odašiljači i veze d.o.o., firstly notified the broadcasters and HAKOM of its intended increase in prices as of 1 February 2023 to subsequently, in line with the principles of socially-responsible operation and in accordance with the efforts of the Government of the Republic of Croatia to counter the impacts of inflation, decided to postpone the implementation of the new prices until 1 July 2023. The unit price was changed in accordance with the changes in the average annual index of consumer prices for 2019, 2020, 2021 and 2022 and the increase was 14.705 percent. However, when calculating the total fee for TV broadcasters, the company Odašiljači i veze d.o.o. took into account the decrease in the number of inhabitants in accordance with the results of the 2021 Population Census, so for the majority of broadcasters the increase reached up to 5 percent and for some up

to 12 percent, while for some broadcasters the fee even decreased negligibly, depending on the decrease in the number of inhabitants in the individual digital region.

Two national networks transmit DVB-T2 multiplex MUX C and MUX E, H.264/AVC encoded signal. Within multiplexes MUX C and MUX E the EVO TV platform transmits Pay-TV programmes.

On the DAB+ digital radio platform, which has been transmitting in the VHF III frequency band since 2021, new broadcasters entered the existing multiplex M1 with a network of 29 transmitters, thus gradually creating the need for a new multiplex and the construction of new transmitters.

After a long process of replanning and optimisation of the VHF III (174-230 MHz) frequency band, the final meeting of the SEE coordination group was held in Budapest in July, which ended in the signing of the Multilateral Framework Agreement by the administrations of Austria, Bosnia and Herzegovina, Croatia, Hungary, Romania, Slovenia and Serbia. The opportunity was also used to sign bilateral agreements defining and harmonising the technical parameters at the bilateral level among all involved administrations. The signing of the agreement was the final act of a long process started back in October 2019. The main objective of the replanning process by the SEE coordination group was a more efficient redistribution of frequency resources allocated under the GE06 Plan in the 174-230 MHz frequency band for the purposes of digital radio broadcast and the international harmonisation of technical parameters of transmitters in order to make the implementation of the digital radio (T-DAB) easier and ensure future operation without interferences. The described replanning process resulted in the new frequency plan in the VHF II band, which provided for seven coverages of the T-DAB signal for all digital regions in the territory of the HR. This ensured additional, i.e. the seventh T-DAB coverage for northern HR, which in the initial WI95 Plan and the subsequent GE06 Plan were not allocated in the VHF III frequency band. In addition, the new plan ensured additional regional coverage to the areas of Istria and Zagreb, which together with the above described coverages at national level provides for further development of the digital radio in the Republic of Croatia.

SPECTRUM CONTROL

HAKOM is competent for ensuring the efficient use and effective management of the RF spectrum. For this purpose, it has set up a system of control and measuring centres and stations in the entire territory of the Republic of Croatia. The system of control and measuring stations is used to control and monitor radio frequencies, perform measurements for frequency planning purposes and to identify and eliminate interferences in the RF spectrum.

Four control and measuring centres have been established in the four largest cities that are operationally supplemented with remotely controlled unmanned stations. For daily tasks of RF spectrum control and other technical tasks within its competence, HAKOM also uses special purpose control and measuring vehicles equipped with adequate measuring equipment. As part of its daily and periodical measurements from immovable control and measurement stations, HAKOM carried out 4,900 measurements in 2023, supplemented by some 800 field measurements.

A control and measuring station (control and measuring station Bilogora) was constructed in 2023 on the location of Suha Katalena on Bilogora, ensuring the control of the RF spectrum in the territory of the Bjelovar-Bilogora County and Virovitica-Podravina County. The construction of this station expanded the HR's capacities as regards measurements of the RF spectrum, and the measuring station became part of a series of facilities that form the national critical infrastructure and the system of national security. The control and measuring station Bilogora is connected with the existing system of control and measuring stations and centres for faster and more precise identification of the RF signal and location of the signal source. In addition to providing for easier and more precise location of the signal source in the RF spectrum, the construction of this facility increased the efficiency of RF spectrum control and planning in general.



Figure 5.4 Control and measuring station Bilogora

The control and measuring station Bilogora enables the control of the radiofrequency spectrum from 9 kHz to 3 GHz. This frequency area is controlled with sophisticated measuring equipment (measuring antennas and receivers) and software support compatible with the measuring system. Within the frequency area of up to 3 GHz the control and measuring station provides for the following types of measuring:

measuring of the strength of electric field;

- locating unknown signal sources;
- collecting data on local density of traffic and interferences;
- measuring frequency;
- measuring modulation;
- measuring of band width;
- identification of emissions;
- determining source direction and location;
- determining location of illegal sources;
- monitoring of legal sources;
- possibility of 24-hour measuring;
- other tasks.



Figure 5.5 New antenna pole at the control and measuring centre Split

A new antenna pole with measuring equipment was erected at HAKOM's control and measuring centre in Split making the control and measuring centre fully operational at a single location. Prior to the construction of the pole the measuring equipment was housed at a much less favourable location within the city of Split, which made the monitoring and control of the RF spectrum less efficient.

A new measuring vehicle equipped with the measuring equipment which provides for better technical characteristics of the measuring system and monitoring and control of the radiofrequency spectrum was procured in a public procurement procedure. The measurement scope was expanded from the current 3 GHz to 8.5 GHz. The new vehicle also utilises new and innovative solutions that provide for a safer and more efficient control of the RF spectrum in the territory covered by the control and measuring centre Split.



Slika 5.6 New measuring vehicle



Slika 5.7 New solar energy station at the control and measuring centre Rijeka

A solar energy station was constructed and became operational at the control and measuring centre Rijeka, ensuring the energetic autonomy of the control and measuring centre Rijeka, while the surplus energy is sent to the electricity network.

All public procurement proceedings conducted for the purpose of maintenance and development of the system of monitoring and control of the spectrum were conducted and completed successfully.

Measuring activities

In accordance with the 2023 measurement plan, all envisaged measuring campaigns were successfully completed. Their focus was on the protection from interferences, measuring of electromagnetic fields (EMF), verification of the coverage of mobile telecommunications network and checking of compliance of WAS/RLAN devices with valid general licences for this frequency

band. The operation of radio stations with microwave links and radio broadcasting radio stations was checked for compliance with the conditions in the issued licences. In addition, measurements required for frequency planning and international frequency coordination were also carried out, especially those for the purpose of cooperation within the Radio Spectrum Policy Group of the EC – RSPG.

Detailed measurements were also conducted regarding mobile telecommunications networks with more than 400,000 measurement points in the territory of the entire Republic of Croatia and more than 10,000 kilometres covered to check compliance with the conditions under Regulation (EU) No 531/2012 on roaming on public mobile communications networks within the Union (TSM Regulation). The measurements were conducted for the purpose of publishing future detailed maps of mobile telecommunications networks. Within the framework of checking compliance with the transparency requirements under the TSM Regulation regarding the speed of internet access in mobile telecommunication networks, detailed measurements were carried out of the key indicators of the performance of mobile telecommunications network operators. HAKOM commissioned an independent survey of key performance indicators of mobile telecommunications networks and for the first time gathered the relevant indicators of user experience in the networks of mobile communications network operators. The results were presented to all operators with the objective of improving the service offered to end-users. The public procurement procedure for the survey of key performance indicators of mobile telecommunications network together including a submission of a report was completed in 2023, with measurements to be conducted and results to be published in 2024.

Within the framework of checking compliance of WAS/RLAN devices, HAKOM established cooperation with the authorities of Bosnia and Herzegovina, i.e. the Regulatory agency for communications (RAK), which resulted in the exchange of experiences and transfer of knowledge aiming to regulate the WAS/RLAN frequency area and ensure uninterrupted operation of meteorological radars within the 5600-5650 MHz frequency bands. The result of this cooperation was the elimination of multiple reported interferences stemming from the territory of Bosnia and Herzegovina.

Technical checks were conducted of regional mobile telecommunications operators in the 5G frequency area.

Measuring electromagnetic fields

In 2023, electromagnetic field (EMF) measurements were carried out in the areas of increased sensitivity with an aim of protecting human health from EMFs. Legal persons authorised for EMF measuring regularly submitted measurement results, confirming compliance with the set standards.

All measurement reports, indicating the location of the measurements are available to the public on HAKOM's GIS portal. This portal also enables browsing through data on locations and basic technical characteristics of base stations in public mobile communication networks and radio stations in broadcasting service. This way citizens can always assess measurement data published thus far. HAKOM also notified the Office of the Ombudswoman of the Republic of Croatia on all measurements of exposure to electromagnetic fields that it had conducted in the territory of the Republic of Croatia in 2023 to check the conditions from the Ordinance on the protection from electromagnetic fields (OG 146/14, 31/19). Reports on exposure to electromagnetic fields in the areas of increased sensitivity are available [at HAKOM' website](#). The reports contain detail descriptions of locations of measurements conducted for all relevant base stations.

HAKOM has at its disposal a mobile measuring probe for measuring exposure to electromagnetic fields which can be placed at a user's location to uninterruptedly monitor exposure over several days. The movable measuring probe is used regularly with user consent and measuring reports are available on HAKOM's website.

Interferences

Identifying and eliminating the sources of interferences in radio communications ensures smooth operation of electronic systems and thus related services. Special attention is awarded to state administration bodies competent for search and rescue, emergency services, maritime and air traffic control radio communications that are important for protecting human life and property, as well as to operators of mobile electronic communications. The number of reported and eliminated interferences by domestic RF spectrum users was 91, slightly more than in 2022 when 71 were registered, with a higher share in maritime services.

A campaign of measuring interferences of radio and TV signals in coastal areas was carried out in the summer months with the aim of monitoring the situation and presence of interference at frequencies allocated to the HR pursuant to international agreements and plans for radio and television frequencies (GE84 and GE06). Measurements conducted in 2023 confirmed that there was a certain number of interferences from FM radio stations from the Italian Republic disrupt-

ting quality reception of Croatian radio programmes along the most part of the coast. Interferences with Croatian television channels were mostly eliminated. The 2023 measuring campaign established a small number of areas where interferences were detected or a lack of reception of the Croatian TV content, which resulted in interferences being reported to the Italian administration.

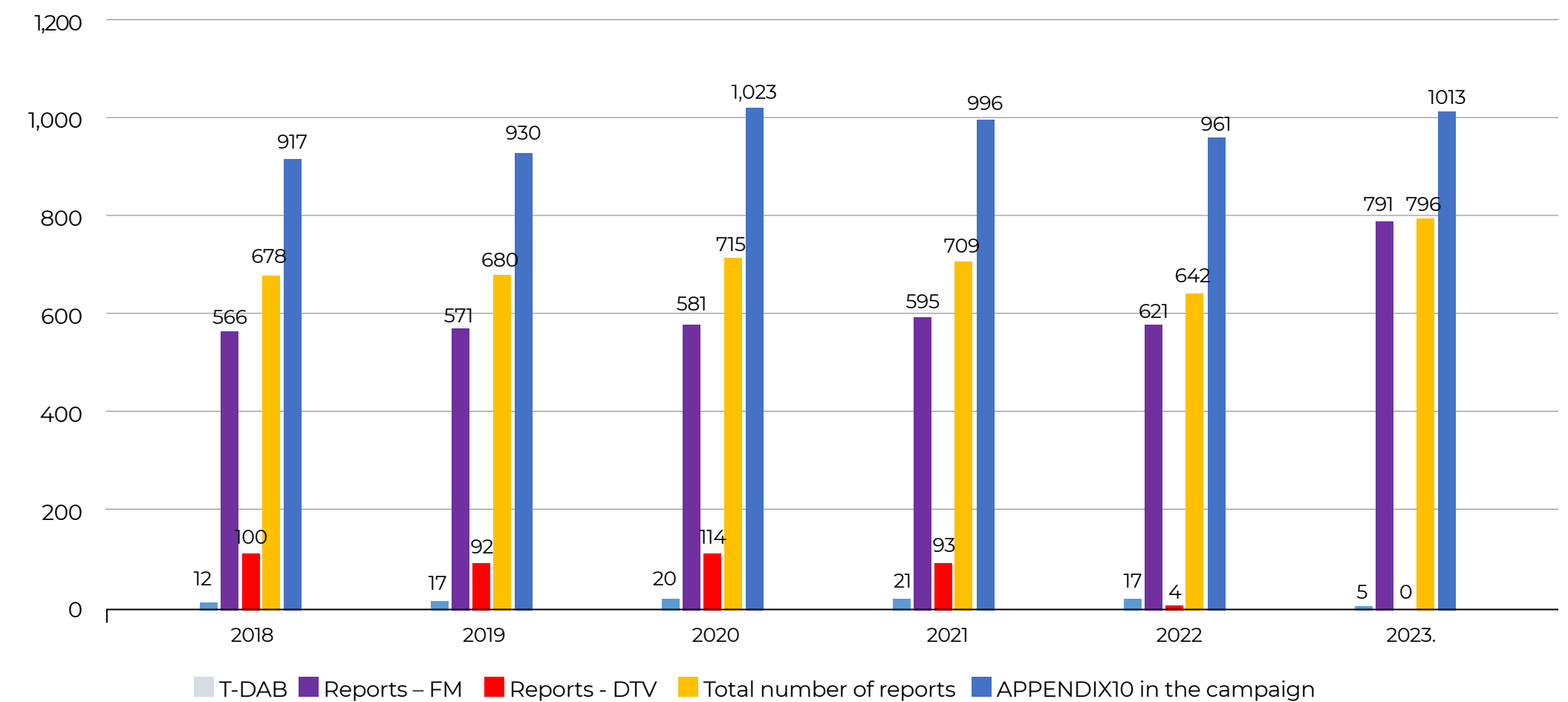
In the FM frequency area, the impact of interferences was measured in relation to more than a hundred Croatian FM radio frequencies along the coast and on Croatian islands. In 2023, 791 reports of interferences were submitted and the comparison of the statistics over the past five years is shown in the Figure below. The increase in the number of interference reports from the year before is a result of the expanded network of HAKOM's control and measuring stations along the coast of the HR and thus an improved detection of disruptive signals.

For several years now, at multilateral meetings organised by ITU and at EC's RSPG Good Offices meetings, HAKOM has been drawing attention to the occurrence of uncoordinated Italian T-DAB transmitters and to likely problems that are now materialised in the FM segment. In the last few years, at bilateral and multilateral meetings the Italian administration has been promising that it would resolve the problem of interferences in the FM area by putting into operation the digital terrestrial radio transmitter (T-DAB) in VHF III band and that it would not use Croatian channels in that area. However, there are several Italian digital terrestrial radio transmitters (T-DAB) operating in the VHF III band that use Croatian channels and do not comply with the technical parameters defined under the International Radio and Television Agreement signed in Geneva in 2006. The 2023 measurements confirm this.

In 2023, HAKOM again notified the Ministry of Sea, Traffic and Infrastructure and the Ministry of External and European Affairs of the years-long problem of Italian interferences with the operation of Croatian radio transmitters.

In addition, HAKOM regularly participates in meetings organised by the ITU. One was organised from 19 to 20 June 2023 between Italy and the neighbouring countries (Croatia, France, Malta, Slovenia and Switzerland) relating to the interferences of Italian transmitters with the radio programmes of the neighbouring countries. At the meeting, HAKOM voiced its strong dissatisfaction with the resolving of interferences because no interferences with 40 priority Croatian FM radio stations (of a total of 160) that Italy should have urgently eliminated were eliminated. The Italian Republic was requested to speedily deal away with FM and T-DAB radio interference in accordance with the specified priorities.

Figure 5.8 Interferences reported to the Italian Republic in line with the ITU procedure



In 2023, HAKOM carried out 8 activities in the segment of control and monitoring of the RF spectrum, eliminated a total of 3 damaging interferences, carried out two activities in the segment of control of releasing to the market and/or to operation of radio equipment and three in the segment of control of electromagnetic fields.

06

CONSUMER PROTECTION



PROTECTION OF END-USERS OF ELECTRONIC COMMUNICATIONS

HAKOM implements a series of activities directed at ensuring preconditions for a high level of protection of service users. Among these, the most important ones are related to the alignment of current regulations with actual market requirements, monitoring how operators carry out the implementation of applicable regulations, informing service users about their rights and obligations and about the characteristics of services, taking into consideration special social groups. In addition, one of HAKOM's key activities is related to the dispute resolution between the end-users of services and operators through which end-users have the possibility to resolve a problem with the operator free of charge or initiate a procedure at court.

In 2023, HAKOM received 22.7 percent less dispute resolution requests from the previous year. This has continued the trend of reducing the number of disputes that are resolved before HAKOM, which represents a significant positive change in the market, in particular regarding the manner of resolving the objections and complaints of service users with the operator. The mentioned changes are also the result of activities carried out by HAKOM in the previous period, with special emphasis on those directed at the improvement of the work of operators' services.

Bearing in mind that a prerequisite for successful protection is a well-informed user, HAKOM continued to inform and educate end-users in 2023. Also, in 2023, the new Ordinance on the manner and conditions for the provision of electronic communications networks and services was prepared, which entered into force on 1 January 2024. The Ordinance includes the issues that have previously been regulated by the [Ordinance on number portability](#) and the [Ordinance on a comprehensive public directory and directory inquiry services](#).

User dispute resolution

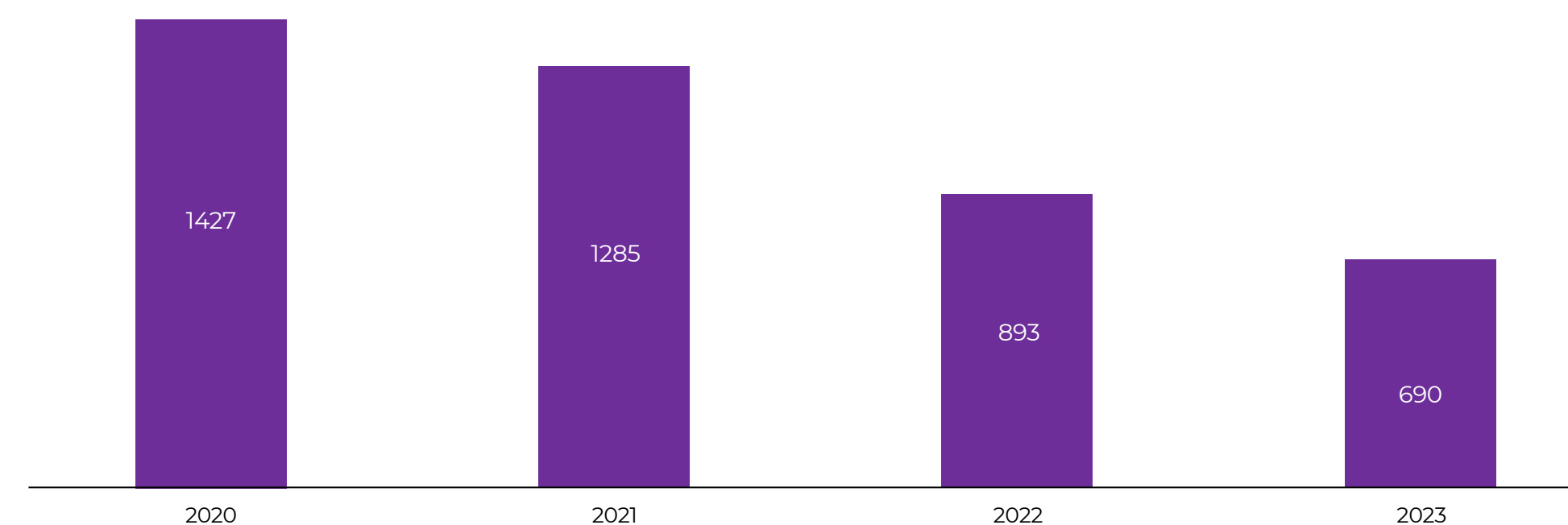
The Electronic Communications Act (ECA) determines the right of the end-user to submit a motion for the resolution of a dispute to HAKOM concerning the amount of the bill, the quality of provided services, the violations of the provisions of subscriber contracts or the violation of the right concerning the protection of open internet access. HAKOM resolves disputes between users and operators based on the opinion of the Complaints Commission, which, in addition to HAKOM's experts, also includes the representatives of consumer protection associations in its work. The statutory precondition for bringing a dispute before HAKOM is to complete a two-instance procedure with the operator, which consists of the submission of an objection and a complaint to the operator. Thus, in case end-users are dissatisfied with the responses of operators to the complaint, they are entitled to initiate a free-of-charge dispute resolution procedure before HAKOM. If users are dissatisfied with HAKOM's

resolution of the dispute, they can also initiate legal proceedings before an Administrative Court. HAKOM uses the results of disputes in the analysis of the situation in the market, which serves as a basis for providing insight into the key issues and proposing and implementing the appropriate measures for improvements. For example, the results of the analysis are a good indicator of the need to change the applicable regulations, the success in the implementation of new provisions, the performance of individual operators' services, the clarity and transparency of the contractual conditions, the familiarity of users with their rights, etc.

In 2023, 690 disputes were resolved, which was a decrease of 22.7 percent from 2022. Since the number of disputes has not increased for six consecutive years, i.e. it has decreased, and taking into consideration that the number of disputes in 2022 decreased by 30.5 percent from 2021, the trend is still significant and in the two years the number of disputes fell by a half.

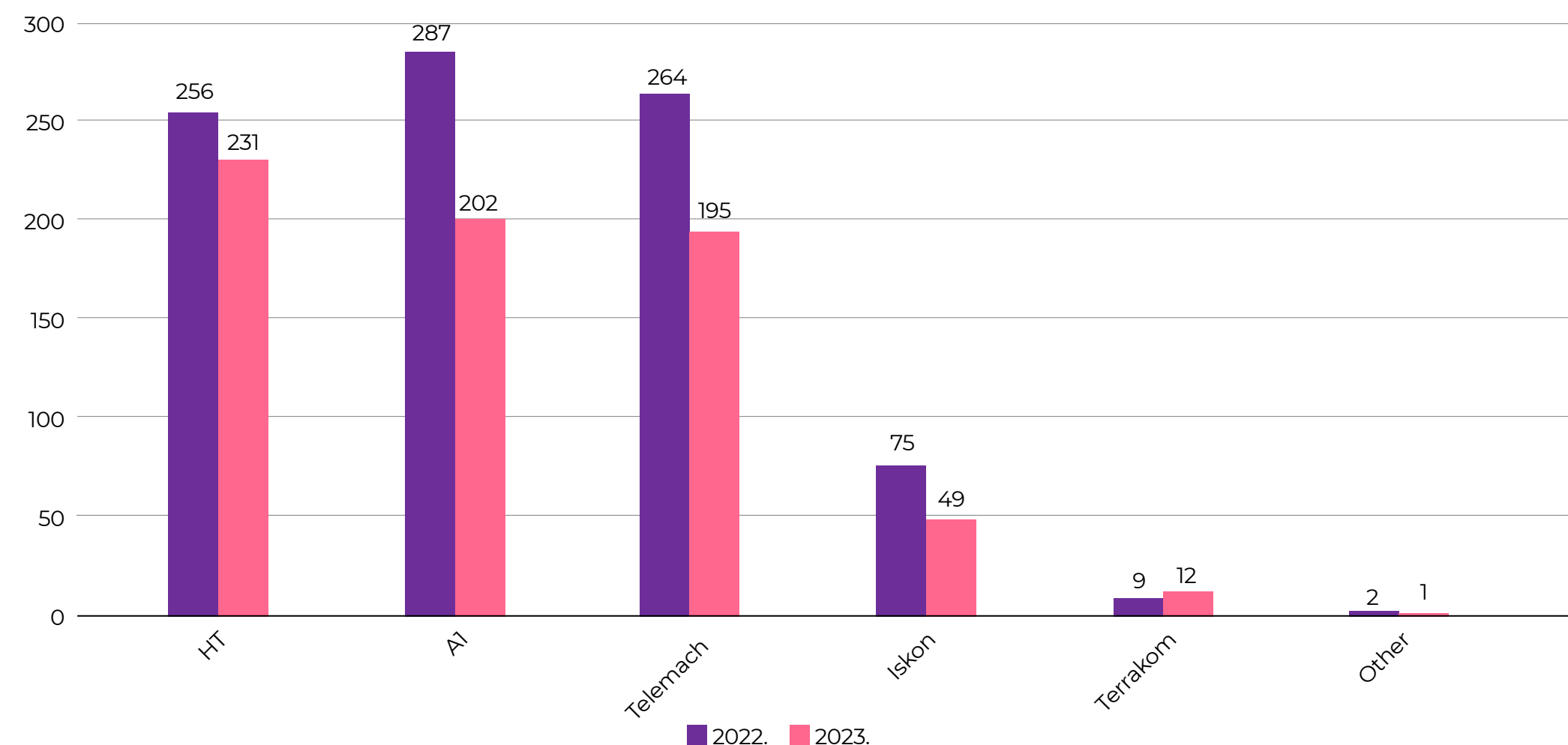
As the number of disputes depends on a significant number of different factors (the number of users, (lack of) information of users regarding their rights, the offer of services, changes in technology for the provision of services, etc.), when evaluating their importance for the situation in the market, it is necessary to take into account the specific circumstances.

Figure 6.1 Number of disputes in electronic communications from 2020 to 2024



One of the key indicators of the analysis is the total number of disputes of each operator and the ratio of the number of disputes to the total number of users of operators. The result of dispute resolution conducted by HAKOM (the ratio of positive to negative decisions adopted by HAKOM) is particularly important because a comparison of these indicators with the previous years' results, among other things, provides the information about the quality of work of the customer support service of the individual operator. A rise in the number of disputes of a specific operator that cannot be correlated with the increase in the operator's user base points to weaknesses in the work of operators' services.

Figure 6.2 Number of disputes by operator in 2022 and 2023



Note: Telemach acquired TotalTV and OT, so that the number of Telemach's disputes for 2022 also contains OT and TotalTV's disputes. HT acquired HT Produkcija, so that the number of HT's disputes for 2022 also contains HT Produkcija's disputes.

Figure 6.3 Average number of disputes per every 10,000 users of each operator

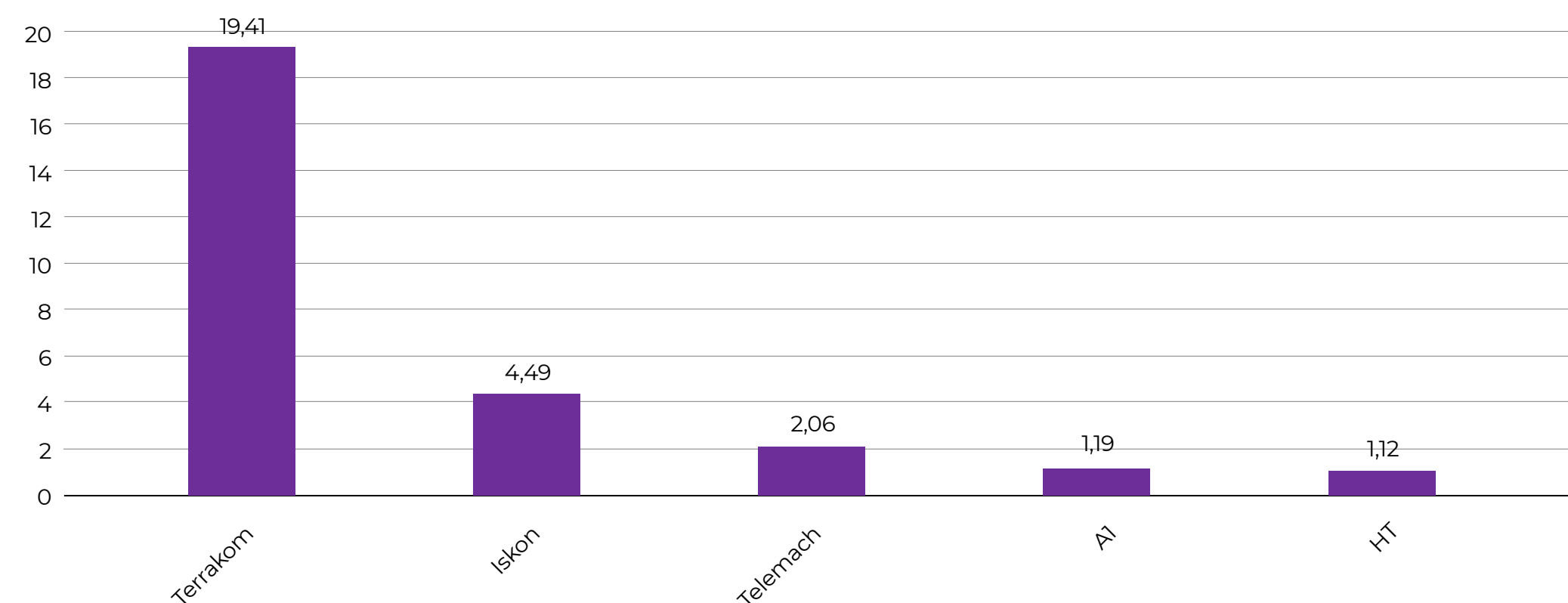


Figure 6.4 Number of disputes by operator in 2023 from 2022

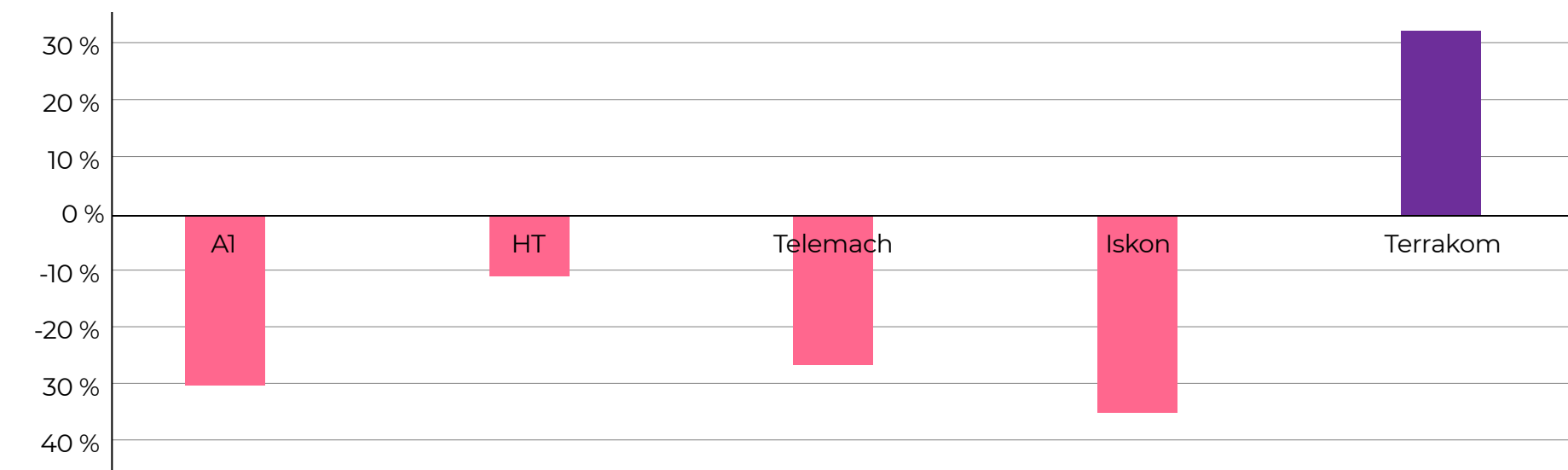
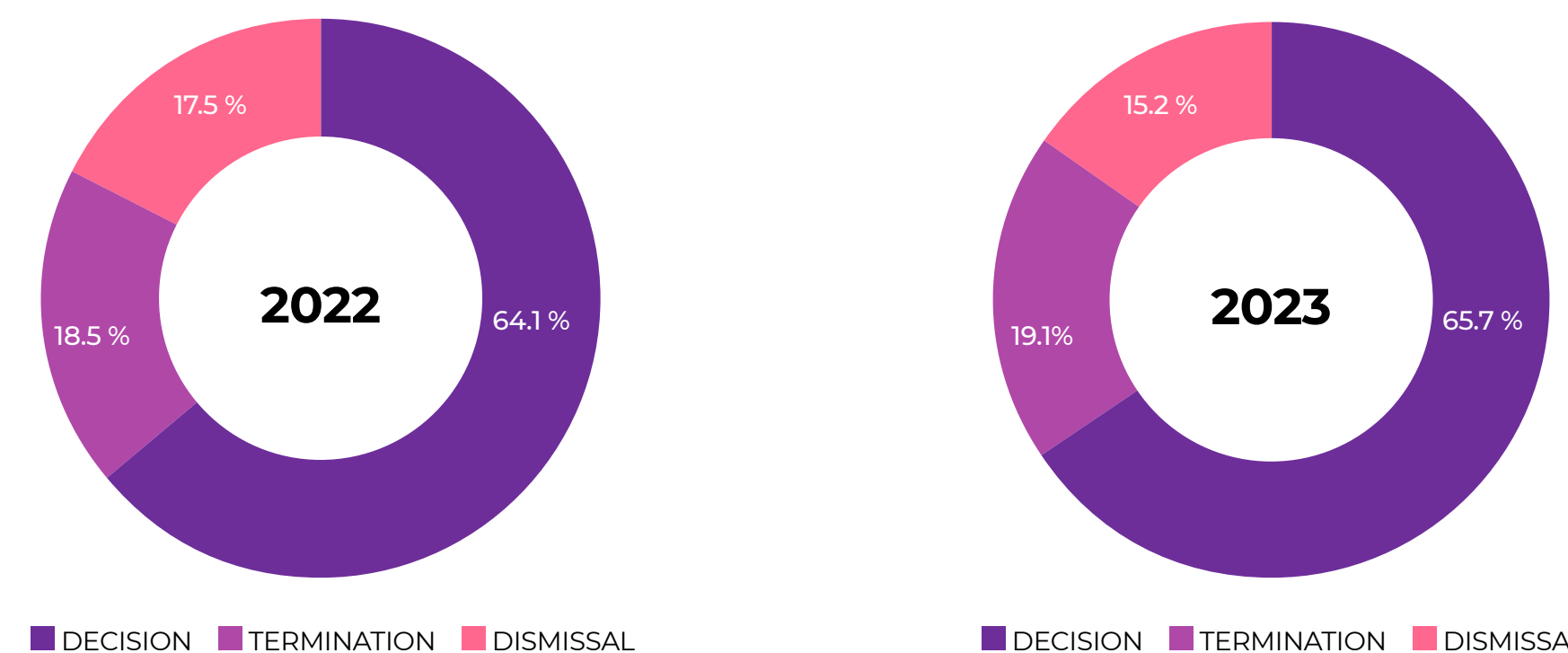
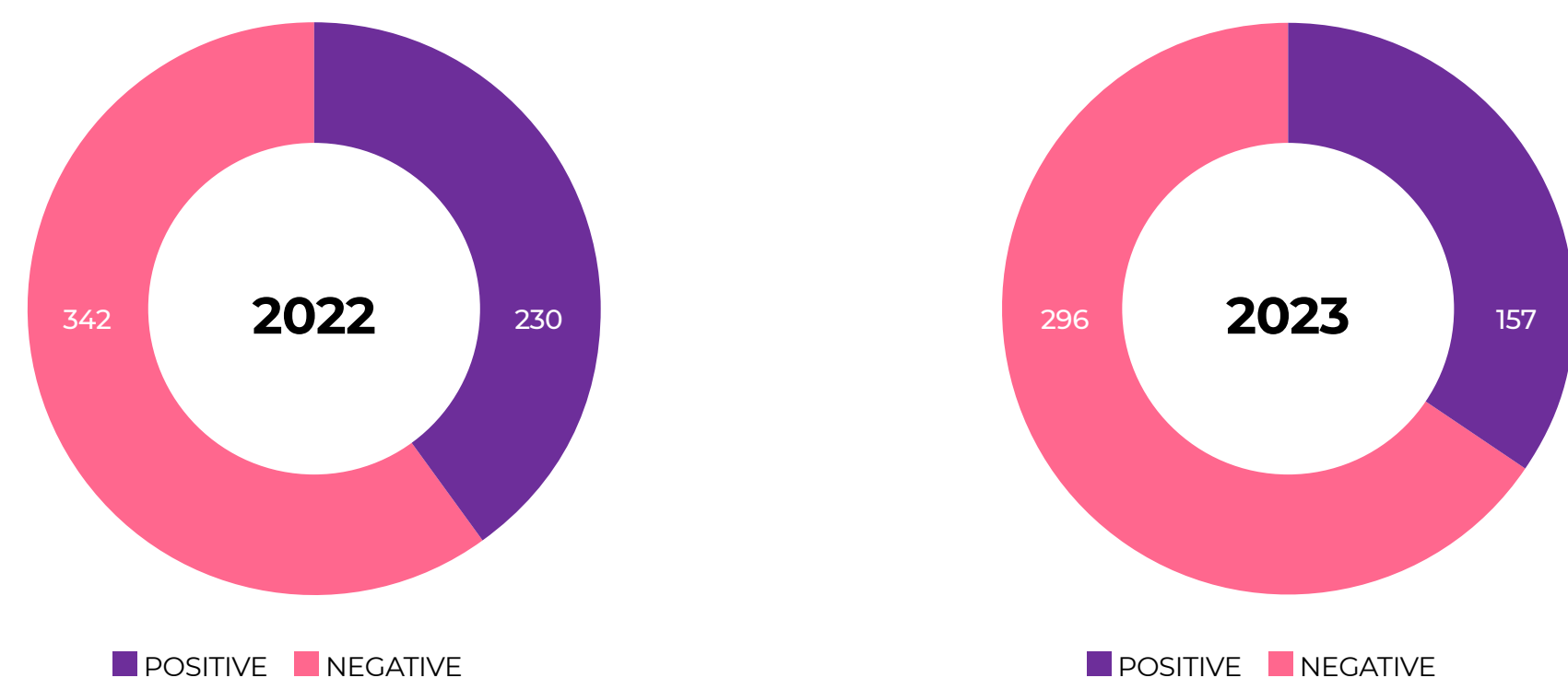


Figure 6.5 Ratio of disputes by type in 2022 and 2023



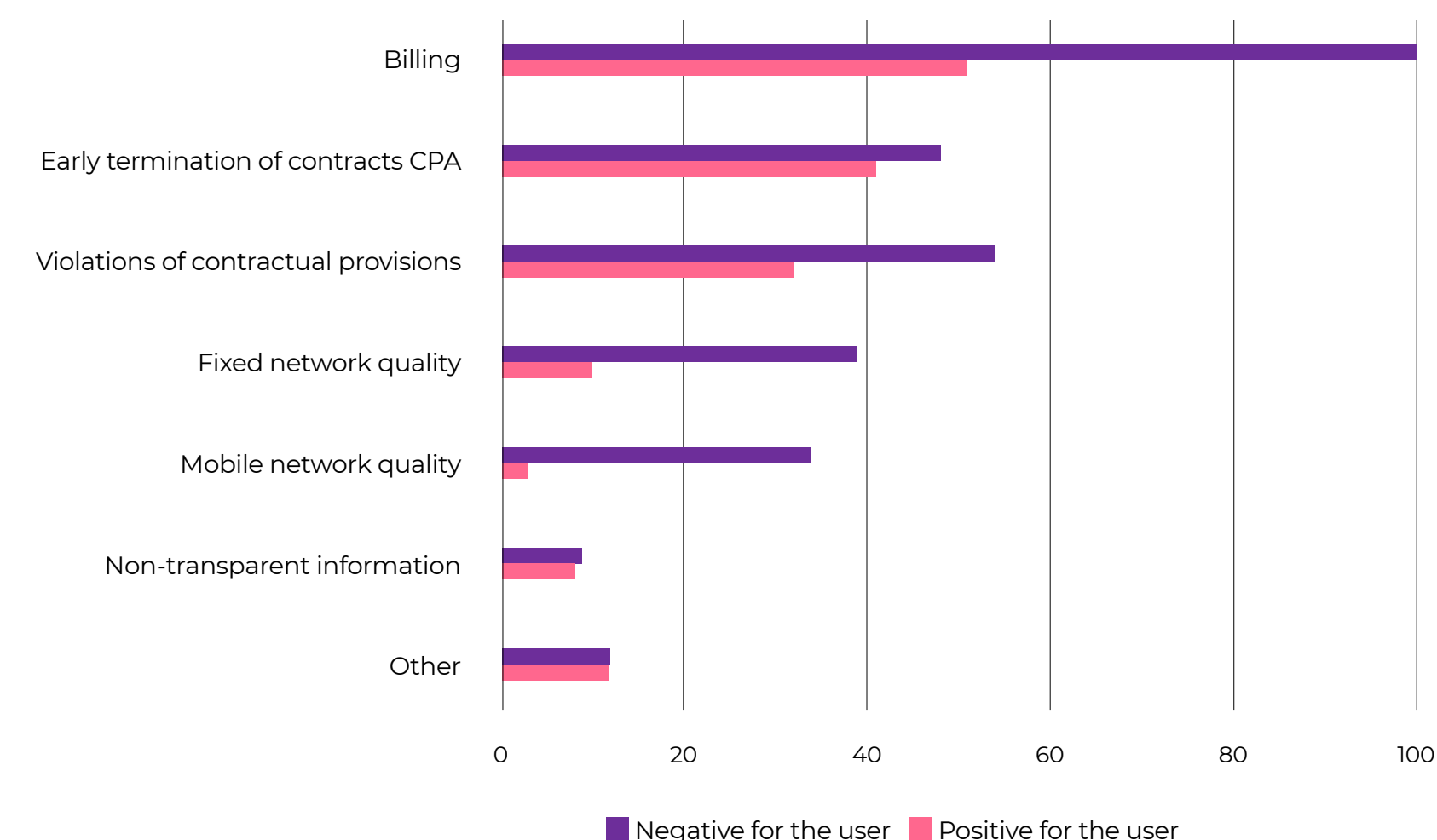
Of the total number of user requests for dispute resolution in 2023, 237 were resolved by adopting a decision on dismissal or termination without the need to deliberate the merits of the case. In 2023, the share of such resolutions in the number of resolved disputes declined moderately, accounting for 34.4 percent, while in the previous year it was 36 percent. The decisions on termination were predominantly reached because the operator subsequently, after the end-user turned to HAKOM, changed its initial decision adopted when resolving complaints and the end-user raised no objections. The decisions on dismissal were predominantly adopted due to the expiry of statutory procedural deadlines for dispute resolution.

Figure 6.6 Ratio of positive to negative decisions for the user in 2022 and 2023



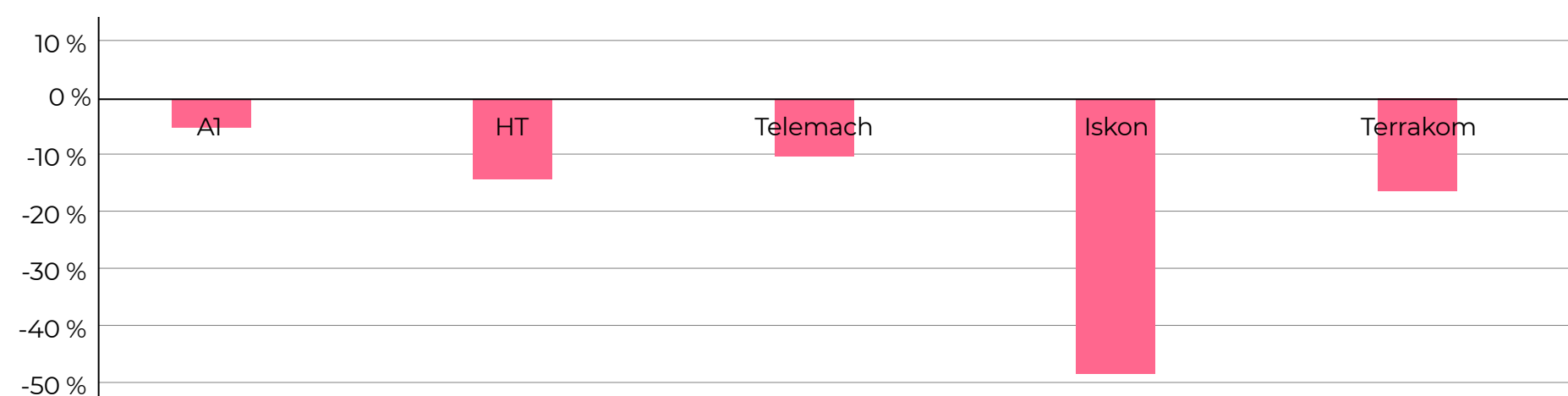
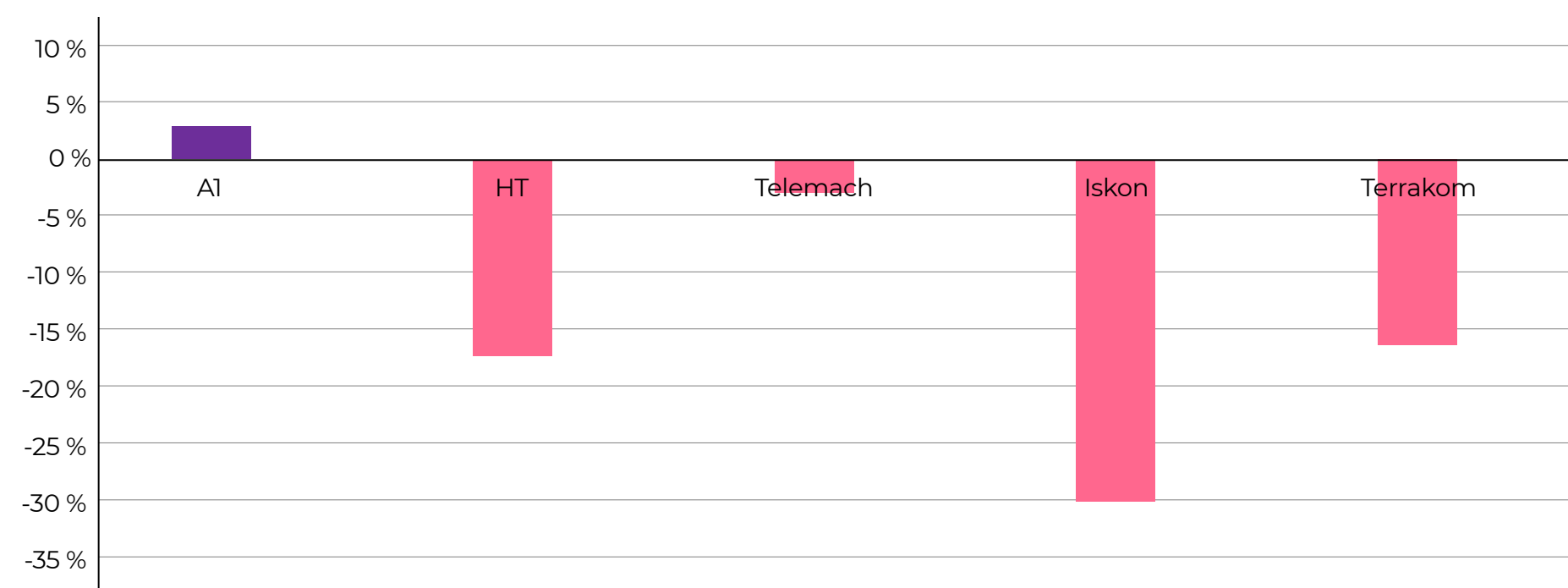
Most disputes between operators and users in 2023, 453 of them, were resolved by a HAKOM's decision. The ratio of decisions in which HAKOM confirmed the second instance decisions taken by operators to decisions in which they were not confirmed is a measure of correct treatment by operators. Specifically, in the cases when operators' services, in particular their consumer complaint commissions, proceed as HAKOM would proceed in a particular case, then the HAKOM's decision in the dispute is negative for the user, i.e. HAKOM confirms decisions taken by operators in such complaints. The fact that 34.7 percent of decisions in 2023 were in favour of the user, while in 2022 that share totalled 40.2 percent, indicates improvement in the work of operators' services in resolving user objections and complaints.

Figure 6.7 Ratio of decisions by reasons for disputes in 2023



The analysis of the reasons why users initiated disputes showed that they were mostly related to bills (billing, consumption and realised traffic), followed by the early termination of the contract due to the violations of contractual provisions.

Monitoring the work of operators in resolving objections and complaints – With an aim of achieving the most efficient resolution of user objections and complaints, i.e. compliance of the work of operators' services and commissions with applicable regulations, in 2023 the practice of publishing the [half-yearly](#) and [annual](#) reports on disputes of end-users in electronic communications was continued, with the reports based on HAKOM's decisions in the closed disputes. In 2023, the trend of a decrease in the number of objections and complaints in the first and second instances was recorded in most of the operators.

Figure 6.8 Number of disputes by operator in the first instance in 2023 relative to 2022**Figure 6.9** Number of disputes by operator in the second instance in 2023 relative to 2022

Cooperation with operators' consumer complaints commissions – Operators' consumer complaints commissions are the last step in which end-users, before turning to HAKOM with the request for dispute resolution, resolve the problem directly with the operator. Therefore, in order to detect and eliminate problems in the work of the mentioned operators' services as efficiently as possible, in 2023, HAKOM continued its practice of holding semi-annual meetings with commission representatives of all operators with significant consumer market shares. At the meetings, operators were acquainted with the results of the analysis of operators' work when resolving user objections and complaints. Based on this analysis and taking into consideration the results of the analysis of HAKOM's decisions in disputes as well as information provided directly by users, operators were proposed specific measures for improving the performance of their services, in particular the work of the commissions when resolving user complaints.

Analysis of general terms and conditions, special conditions and price lists – These documents form part of each subscriber contract. Considering the fact that they should comply with the applicable law and subordinate legislation, as well as the fact that the lack of knowledge or understanding of specific provisions in these documents is one of the most frequent causes for disputes, HAKOM monitored their amendments regularly and, upon need, requested from operators to make certain corrections.

Information and education of users

In 2023, as well as in the previous years, HAKOM paid particular attention to informing and educating users through different communication channels. Relevant information on services, rights and obligations of users and operators and on the manner of resolving problems when using services is available on HAKOM's official website. In addition, HAKOM provides users with all necessary information and **answers to user inquiries** through different communication channels (direct telephone contact with HAKOM's experts, regular mail, e-mail, the "Ask Us" application and social media). One of the popular communication channels among users is the direct telephone contact with HAKOM's experts, who are available to users every working day from 9 a.m. to 11.30 a.m. and from 12.30 to 3.30 p.m.

Users were also informed through direct contacts with users and the representatives of consumer protection associations, appearances of HAKOM's experts on TV and radio shows concerning consumer topics and through cooperation with other authorities competent for consumer protection policies. For instance, in 2023, **in cooperation with consumer protection associations**, HAKOM held nineteen lectures on user rights and operator obligations (e.g. in Bjelovar, Omiš, Opatija, Daruvar, Rijeka, Garešnica, etc.). Furthermore, on 25 September 2023, a round table was held with representatives of consumer protection associations concerning the rights of users and the obligations of service providers in electronic communications, postal and rail services. Since the new Ordinance on the manner and conditions of provision of electronic communications networks and services entered into force on 1 January 2024, the representatives of associations were informed about the most important amendments concerning service users, as well as the novelties introduced by the Digital Services Act and the Products and Services Accessibility Act. In addition, with the aim of achieving an easier and a more efficient resolution of difficulties faced by service users, the participants exchanged their own experiences in consumer protection.

In October 2023, HAKOM organised the jubilee tenth Market Day gathering the representatives of operators, the economy, consumer protection associations and the regulators trying to find the answers to some of the currently topical issues in the market. The conference included a pa-

nel discussion on the topic of improving the user experience in the time of modern technology. Since the timely repair of a malfunction and the speed of responding to user questions are the precondition for achieving consumer satisfaction, emphasis was placed on improving the work of user and technical services of operators.

With the aim of informing and educating users in 2023, a [leaflet](#) was developed containing information that each user should know when using electronic communication services in mobile and fixed networks, which was also published in electronic form. Printed leaflet copies were made available to counselling centres, consumer associations and operators. Also, two educational videos are currently available at [HAKOM's YouTube channel](#) on the quality of services in mobile and fixed networks and three educational video recordings on how to file complaints, enter into distance contracts and child protection on the Internet.

User applications:

In order to facilitate the use of electronic communication services, HAKOM has provided the users, free of charge, with the following applications:

- [HAKOMetar](#) – which serves for measuring internet speeds in fixed networks. Measurement results may be used for all cases of objections to operators and for dispute resolution.
- [HAKOMetar Plus](#) – which serves for measuring internet speeds in mobile/wireless networks. Data traffic usage from the contracted tariff package is not calculated for the first ten measurements in a single month. The application enables a presentation of the statistics of measurement results, a presentation of measurement on a chart and a presentation of the quality of signals of all networks based on user measurements.
- [Cost estimate](#) – which makes it easier for the users of telephone or internet access services to find the most favourable tariff in accordance with their telephone or internet usage habits.
- [Do Not Call Register](#) – which serves to check whether the number is entered in the Register. By entering their telephone number in the Register, users confirm they do not want to be contacted for advertising and sales purposes by merchants. At the end of 2023, there were 74,089 telephone numbers entered in the Register.

PROTECTION OF POSTAL SERVICE USERS

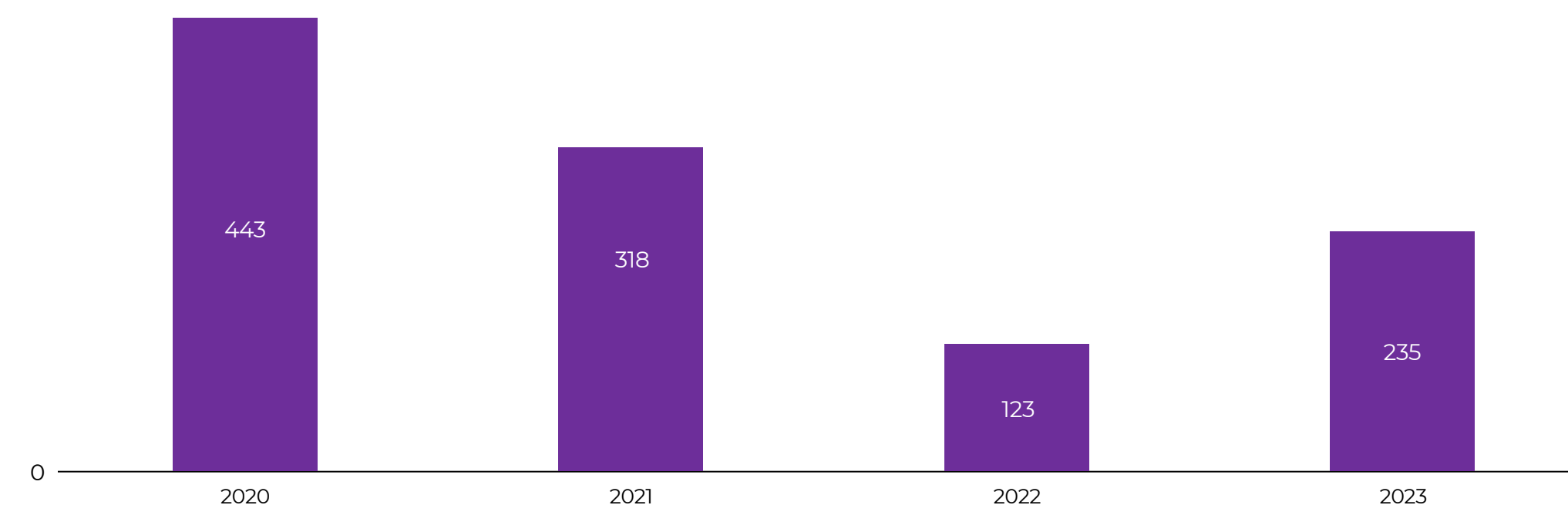
With regard to a significant increase in the number of received user submissions and requests for the resolution of disputes between users and a specific provider, it can be said that 2023 was an exceptionally challenging year for the postal market. In 2023, HAKOM received 91 percent more dispute resolution requests and 173 percent more submissions from the previous years. Through dispute resolution and user submissions important data on potential violations were collected. The data were forwarded to postal inspectors who then regularly went on site. Among other significant activities directly related to users, it is noteworthy that a survey of the satisfaction of postal service business users was conducted and a round table was organised for consumer associations and postal service providers.

According to the provisions of the CPA, a user of postal services may submit a written complaint to a postal service provider in a complaint resolution process in the cases of loss of a postal item, non-compliance with the deadline for transfer and delivery, if the postal service was not provided in part or in full, and in the cases of damage or loss of contents of a postal item. A user has the right to submit a complaint (consumer complaint) to the consumer complaints commission of the postal service provider to a written reply of the service provider. In case of a continued dispute regarding the complaint, the user may submit a request for dispute resolution to HAKOM within the statutory time limit.

Disputes are resolved by decisions adopted based on the opinion of the consumer complaints commission, an advisory body established at HAKOM, which also includes the representatives of consumer protection associations as members.

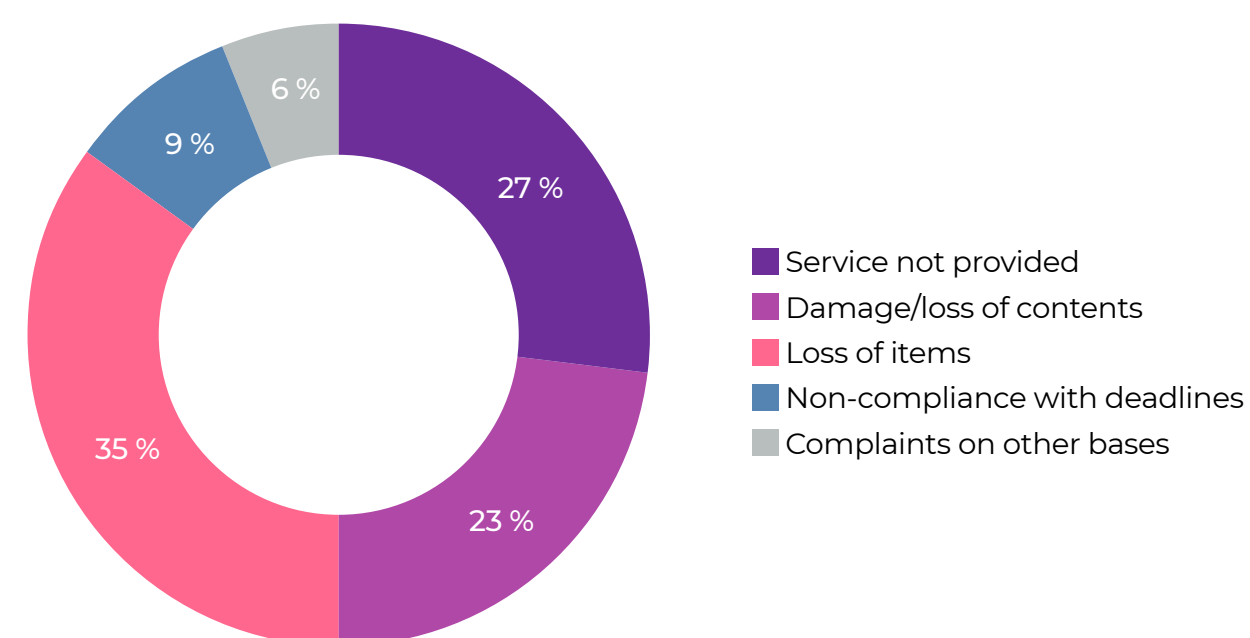
In all, 235 dispute resolution requests were received in 2023. The largest number of the total received requests, 207 or 88 percent of them, were related to disputes with the universal service provider, HP, and twelve percent to other postal service providers.

Figure 6.10 Number of user disputes in the postal services market



According to the type of complaint, the majority of user complaints referred to the loss of a postal item, failure to provide a postal service and damage/loss of contents.

Figure 6.11 Shares of types of complaints in received requests in the postal services market



According to the type of the contracted postal service, the most represented was parcel (24), which belongs to other postal services, with a share of 61 percent (143 requests referred to Paket24), followed by registered mail (53) within the universal postal service. Users also complained more about services in domestic traffic, accounting for three fifths of all requests (62%).

In all, 162 disputes were resolved in 2023, of which 149 were addressed in 2023, while 13 were transferred from 2022. Pursuant to a decision, 89 requests were rejected, and 43 requests were adopted or partially adopted. In twenty cases a decision on termination was reached (at users' requests because they resolved the disputes amicably with postal service providers), while ten cases ended with the adoption of a decision on dismissal because such requests did not refer to complaints referred to in Article 54 of the PSA, were not submitted in a timely manner or were submitted by unauthorised persons.

PROTECTION OF PASSENGERS IN RAILWAY PASSENGER TRANSPORT

Situation in the market – passenger transport

Pursuant to the ARSM, HAKOM is also competent for the protection of passenger rights and for resolving passenger requests against the decisions of the consumer complaints commissions of railway undertakings.

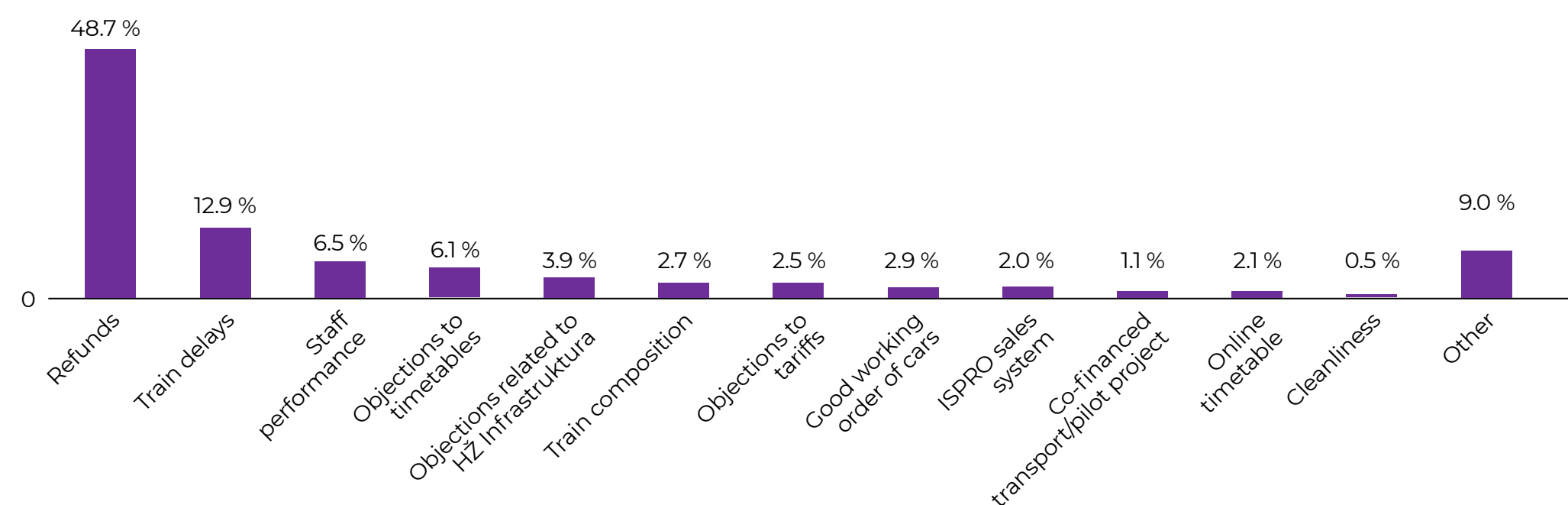
Passengers are entitled to submit a written complaint to a railway undertaking or service facilities operator whose average annual traffic exceeds 10,000 passengers per day for the protection of their rights prescribed by Regulation (EU) 2021/782 of the European Parliament and of the Council on rail passengers' rights and obligations, which entered into force on 7 June 2023, the ARSM and the Act on Transportation Contracts in Railway Traffic, the RA and the General terms and conditions of the passenger transportation contract.

Legal protection is provided in three instances. The first instance is the railway undertaking or the service facilities operator, the second is the consumer complaints commission of the railway undertaking/operator and the third instance of legal protection for passengers is HAKOM. The time limits for submitting complaints and requests to HAKOM are regulated by the ARSM. Eight decisions pursuant to passenger requests were adopted in 2023, of which three cases were dismissed, four were accepted and one was rejected.

The most frequent reasons for passenger complaints referred to the implementation of Regulation 2021/782 and the General terms and conditions of the transportation contract (the tariff for the transport of passengers in domestic traffic – Tariff 101), i.e. to reimbursements for the tickets, the timetable and information on the HŽPP website.

HŽŽP received 8,669 passenger complaints in 2023 in the first instance. Almost half of the complaints referred to the reimbursement of money, followed by train delays, while other complaints referred to staff performance, the train schedule, the 101 Tariff, the good working order of cars, the ISPRO sale system, the online timetable and cleanliness.

Figure 6.12 Passenger complaints



PROTECTION OF PERSONS WITH DISABILITIES

The programme on accessibility for persons with disabilities (PwD) and persons with reduced mobility (PwRM) continually improved activities based on the achieved results from the previous years. In 2023, cooperation between HAKOM and the Faculty of Electrical Engineering and Computing, University of Zagreb (FER) in the development of an inclusive society continued through a project for persons with disabilities. The project included two main components – increase in the accessibility of travel by rail and raising awareness of the society in general on accessibility issues.

The analysis of the accessibility of rail passenger transport was conducted by taking into consideration the report of the Office of the Ombudswoman for Persons with Disabilities and the supervision of the situation at railway stations and on trains was carried out. Performed activities were structured in several phases:

Phase one: the maintenance of a functional and accessible website with information on the project and benefits for the specific groups of users in accordance with information provided by telecom operators and railway undertakings. New offers by telecom operators were published, the website name was changed to Accessible Window to the World of Information on Offers by Telecom Operators and HŽPP, a proposal was made to upgrade network accessibility and the accessibility of documents on the transportation of persons with disabilities and persons with reduced mobility on www.hzpp.hr was tested.

Phase two: a survey of the needs of persons with disabilities before and while travelling by train. Different cooperating associations dealing with the topics on persons with disabilities were included in the survey.

Phase three: the identification of the elements that would have positive effects on persons with disabilities and persons with reduced mobility when using railway services. A number of working meetings were held, regulations and instructions on procedures when transporting persons with disabilities (HŽPP and HŽI) were analysed, the elements that require investing a great effort were identified (e.g. the improvement of infrastructure accessibility, the development of a mobile application designed for passengers according to the prototype developed on the project that would be integrated with the information systems of HŽI and HŽPP), a medium effort (e.g. staff training, the implementation of accessibility into the HŽPP website) and a small effort (the improvement of the pronunciation of speakers at railway stations, the installation of communication panels).

Phase four: the improvement of communication of HŽI and HŽPP staff with persons with disabilities. A survey was conducted and a questionnaire covered 539 employees of HŽPP and HŽI about their views and experiences in communication with persons with disabilities and accessibility. Phase five: a proposal was made to broaden the education of HŽI and HŽPP staff live through online platforms or video recordings, with an active participation of the representatives of persons with disabilities. The objective is to raise awareness, increase sensitivity and improve the understanding of the situations that persons with disabilities experience when travelling by train. Furthermore, the intention is to adopt more efficient methods of communication with different groups of persons with disabilities and reduced mobility.

Phase six: communication panels at railway stations. This review investigates the potential application of communication panels at railway stations and presents proposals for their design. Proposals of a communication panel with questions, the alphabet, symbols and the proposal of a sign for communication accessibility were discussed.

Phase seven: technology for an increased accessibility of passenger transport by train is an extended prototype of a mobile application for rail transport. The purpose of the application is to increase the accessibility of passenger transport by train. The application prototype was developed on the Accessibility 2022 project and was expanded based on the results of the questionnaire administered among the representatives. The prototype may serve to HŽI and HŽPP as a sample of the functionalities that should be included in the mobile application designed for passengers that will be connected with the HŽPP and HŽI information systems.

Brochure and poster

For the purpose of facilitating the implementation of Regulation (EC) 2021/782 on rail passengers' rights and obligations HAKOM revised the brochure for passengers in rail passenger transport based on the analyses of the most frequent questions raised by passengers. In a suitable format, the brochure offers a large number of concise and interesting information with the objective to inform passengers and raise awareness about their rights and obligations in rail passenger transport. The data in the brochure are revised every two years in accordance with the changes in the legislation and on the market. The brochure and the poster are distributed at railway stations, stops, on trains and at public events organised by HAKOM.

Figure 6.13 New brochure for rail passengers



CHILD PROTECTION

In 2023, HAKOM continued the activities on raising awareness about the safe and responsible usage of the internet and mobile devices among children and youth. The Safer Internet Day was marked on 7 February 2023, organised by HAKOM in cooperation with the Primary School Rapska, where the topics of discussion included efficient parental protection and other numerous possibilities based on which parents can have information about the activities of children on the internet. On the occasion of the marking of the Safer Internet Day, HAKOM participated in the Pledge for a Better Internet conference organised by the Partners in Learning association, CARNET and the National CERT. The updated Privacy Calculator application was presented at the conference. The application's main purpose is to inform end-users of access to the internet service about potential threats that may arise by providing personal data on the internet. In 2023, numerous trainings were held in cooperation with the Consumer Protection Association of the Bjelovar-Bilogora County and the Consumer Protection Centre of the Vukovar-Srijem County - Voice of Consumers. Workshops were held for pupils attending the fourth, fifth, sixth and seventh grades at primary schools in Vinkovci, Vukovar, Bilje, Gudovac, Bjelovar, Nijemci, Brešana, Garešnica, Grubišnom Polje, Daruvar, Nedelišće and Babina Greda. Additional education regarding the protection of children on the internet was provided by the appearance on a radio and TV show. In 2023, as in the previous years, the brochure entitled [How to protect yourself in the world of the internet and mobile phones](#), was redesigned and updated with news. The brochure contains practical and useful advice about the dangers of and safety on the internet, the protection of privacy and personal data as well as about responsible behaviour on and use of social networks. It is part of HAKOM's programme of informing children and parents that has been implemented in cooperation with the Ministry of Science and Education since 2016. The brochure has been sent to all primary schools in the HR to be distributed in sufficient quantity to five-grade pupils.



07

HAKOM'S
OTHER
ACTIVITIES

BROADBAND COMPETENCE OFFICE

HAKOM performs the tasks of the Broadband Competence Office (BCO) and, as the Croatian BCO, is a member of an EU-wide Broadband Competence Offices Network ([BCO Network](#)). One of the BCO's main tasks is to encourage demand for very high capacity networks. The BCO also provides support to competent authorities in the implementation of strategies, plans and programmes of broadband access development. Accordingly, HAKOM is designated as the competent authority for the implementation of a comprehensive analysis of potential activities and measures on the demand side that would represent an upgrade of the measures on the supply side and that might have a positive effect on the take-up of very high-speed services. The analysis is part of the activities related to the implementation of strategic objective 3: VHCNs deployed, available, and taken up, from the [Digital Croatia Strategy for the period until 2032](#) (SDH2032).

In 2023, HAKOM conducted the requested analysis taking into consideration the current situation in the market, the availability of high-speed networks and the opinions of users regarding the prices of services and the need for high-speed services. The analysis has established that the measure in the form of allocating vouchers to households would have the largest impact on the increase in the use of high-speed services in the HR considering the mentioned factors. If the necessary means are ensured, the vouchers for households would cover part of the expenses of the internet access service in a specific period (one or two years). The results of the analysis were submitted to the Central State Office for the Development of the Digital Society, responsible for the SDH2032 implementation and to the European Commission, since the use of very high capacity networks is one of the indicators used in preparing the reports on the implementation of the targets of the Digital Decade. According to the values of this indicator, the HR still lags behind the EU average and, within its own capacities, it is expected to improve the segments identified as weak and design measures for their improvement. The possibilities to realise the proposed measures will be considered by the MSTI in the forthcoming period, depending on the available funds from the state budget and/or European funds, primarily from the European Regional Development Fund (ERDF).

To meet the BCO's tasks more efficiently, a new section related to the BCO was developed within the HAKOM website in 2023. It explains the BCO's role and provides the basic information about broadband access. Current issues regarding the development of broadband access are also regularly published at the national and EU level, including the current issues in the area of co-financing and EU funds.

The BCO's Network organises a large number of workshops and meetings with the aim of exchanging knowledge and experiences among Member States in which HAKOM representatives participated regularly in 2023. The workshops address the current issues of broadband access development, ranging from the construction of infrastructure and the RF spectrum use, through co-financing opportunities, to the exchange of the regulatory framework and the development of technologies applied to broadband access.

BCOs Network organizira veliki broj radionica i sastanaka s ciljem razmjene znanja i iskustava između zemalja članica na kojima su predstavnici HAKOM-a redovito sudjelovali tijekom 2023. Radionice su posvećene aktualnim pitanjima razvoja širokopojasnog pristupa od izgradnje infrastrukture i uporabe radiofrekvencijskog spektra, preko mogućnosti sufinanciranja, do izmjena regulatornog okvira i razvoja tehnologija koje se primjenjuju za širokopojasni pristup.

Framework National Programme

The year 2023 was the final year for the absorption of grants allocated for the projects within the [Framework National Programme for the Development of Broadband Infrastructure in Areas Lacking Sufficient Commercial Interest for Investments](#) (FNP). HAKOM, as the Competent Authority for the FNP (CAFP) monitors the implementation of the FNP regarding the built infrastructure, i.e. the covered addresses and households and the number of users in accordance with the signed co-financing agreements. As part of the FNP, funds were granted for 21 projects. However, in 2022, at the request of the competent authority, the agreement for the project that was implemented based on the Broadband Infrastructure Development Plan (BIDP) Donja Voća was terminated. Of the remaining twenty projects, sixteen are being implemented under model A – private DBO (Design, Build, Operate) model and four under model B – public DBO model. These projects cover a total of 118 local and regional self-government units, and with their full implementation 146,000 households, i.e. 197,000 addresses will be covered. The total eligible investment costs of these twenty projects amount to about EUR 149m, of which EUR 82m is allocated through grants from the financial perspective 2014 – 2021.

Table 7.1 Projects agreed within the first call based on the FNP

COMPETENT AUTHORITY	INVESTMENT MODEL	GRANT AGREEMENT SIGNATORY	GRANT (EUR million)	CONTRACTED NUMBER OF HOUSEHOLDS IN THE WHITE AREA	REALISED NUMBER OF HOUSEHOLDS IN THE WHITE AREA
Poreč City (Scope: Poreč City and Municipalities Funtana, Kaštelir-Labinci, Sveti Lovreč, Tar-Vabriga, Višnjan, Vižinada, Vrsar and Tinjan)	A (private)	HT	3.71	5,072	5,072
Rovinj City (Scope: Cities Rovinj-Rovigno and Vodnjan-Dignano and Municipalities Bale-Valle, Kanfanar, Svetvinčenat and Žminj)	A (private)	HT	3.98	4,828	2,759
Kaštela City (Scope: Cities Kaštela, Split and Trogir and Municipalities Lečevica, Marina, Okrug, Prgomet, Primorski Dolac and Seget)	A (private)	AI	6.84	19,410	16,719
Zaprešić City (Scope: City Zaprešić and Municipalities Brdovec, Dubravica, Jakovlje, Luka, Marija Gorica, Pušća)	A (private)	HT	3.57	10,094	10,094
Medulin Municipality (Scope: Municipalities Medulin, Barban, Ližnjan-Lisignano, Marčana)	A (private)	HT	3.03	4,338	4,264
Ivanić Grad City (Scope: Cities Ivanić-Grad and Dugo Selo and Municipalities Brckovljani, Kloštar Ivanić and Križ)	A (private)	AI	4.78	8,203	8,203
Dubrovnik City (Scope: Dubrovnik City, Municipalities Dubrovačko Primorje, Konavle and Župa Dubrovačka)	A (private)	HT	4.73	10,978	9,043
Mursko Središće City (Scope: City Mursko Središće and Municipalities Gornji Mihaljevec, Nedelišće, Selnica, Strahoninec, Sveti Juraj na Bregu, Sveti Martin na Muri, Šenkovec and Štrigova)	A (private)	HT	3.2	9,735	9,716
Vukovar City (Scope: Cities Vukovar and Ilok, Municipalities Bogdanovci, Borovo, Lovas, Negoslavci, Nuštar, Tompojevci, Tovarnik, Trpinja)	A (private)	HT	3.95	15,079	14,216
Sveta Nedelja City (Scope: Cities Samobor and Sveta Nedelja, Municipality Stupnik)	A (private)	HT	4.32	9,014	7,035

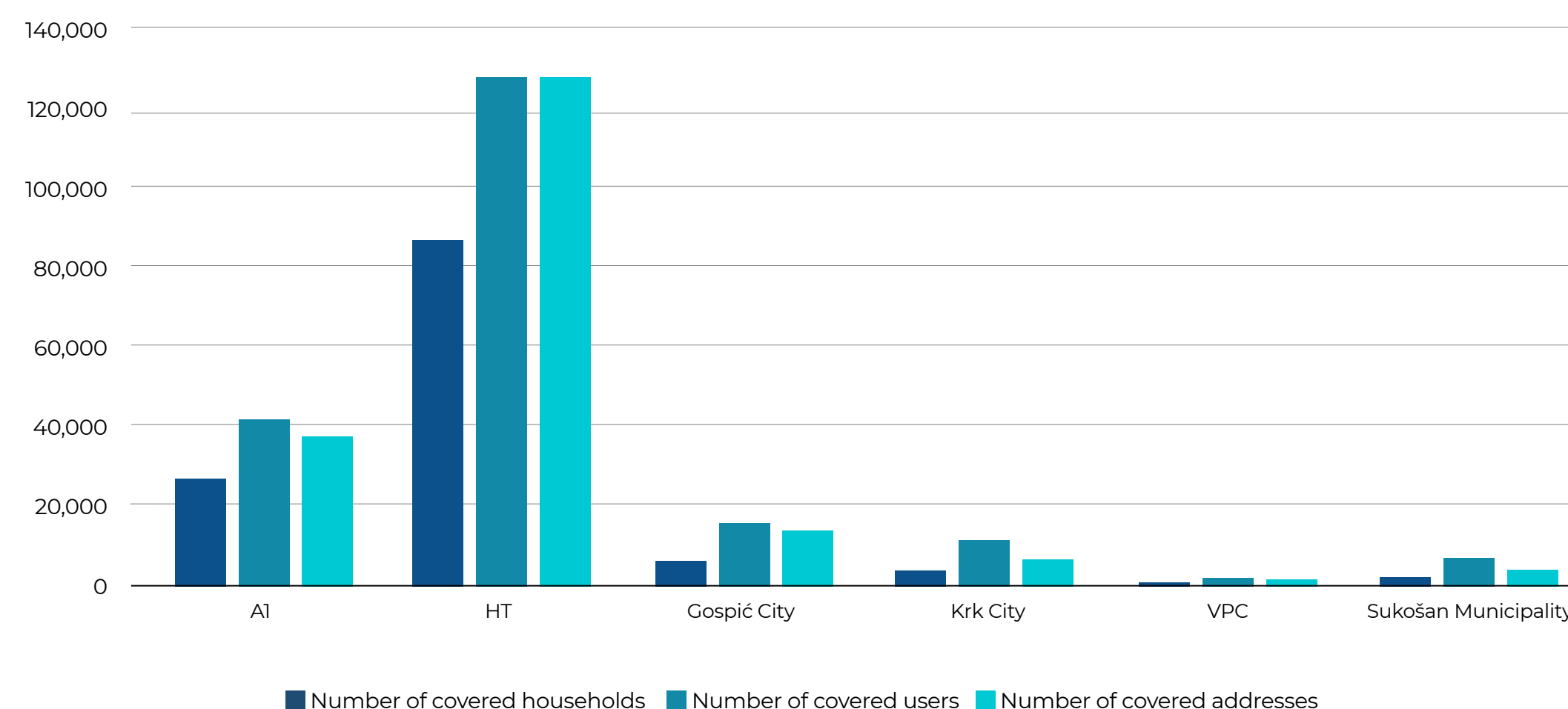
COMPETENT AUTHORITY	INVESTMENT MODEL	GRANT AGREEMENT SIGNATORY	GRANT (EUR million)	CONTRACTED NUMBER OF HOUSEHOLDS IN THE WHITE AREA	REALISED NUMBER OF HOUSEHOLDS IN THE WHITE AREA
Ludbreg City (Scope: City Ludbreg, Municipalities Mali Bukovec, Martijanec, Sveti Đurđ and Veliki Bukovec)	A (private)	HT	1.84	2,595	2,178
Solin City (Scope: Solin City)	A (private)	AI	1	1,965	1,965
Gospić City (Scope: Cities Gospić and Otočac, Municipality Plitvice Lakes)	B (public)	Gospić City	9.97	6,885	6,835
Brod-Posavina County (B) (Scope: Municipalities Donji Andrijevi, Garčin, Gornja Vrba, Gundinci, Klakar, Oprisavci, Sikirevci, Slavonski Šamac, Velika Kopanica, Vrpolje)	A (private)	HT	2.4	6,791	5,273
Krk City (Scope: City Krk, Municipalities Baška, Dobrinj, Malinska-Dubašnica, Omišalj, Punat and Vrbnik)	B (public)	Krk city	7.65	3,997	3,942
Virovitica-Podravina County (Scope: Municipalities Crnac, Čačinci, Čadavica, Mikleuš, Nova Bukovica, Sopje, Vočin and Zdenci)	B (public)	Virovitica-Podravina County	4.74	3,209	1,149
Sukošan Municipality (Scope: Municipalities Sukošan, Galovac, Sveti Filip i Jakov and Škabrnja)	B (public)	Sukošan Municipality	4.75	2,711	2,699
Grad Omiš Omiš City (Scope: Omiš City, Municipalities Dugi Rat, Podstrana and Zadvarje)	A (private)	HT	2.67	5,260	4,311
Đurmanec Municipality (Scope: City Krapina, Municipalities Đurmanec, Jesenje, Petrovsko and Radoboj)	A (private)	HT	2.92	7,058	7,058
Osijek-Baranja County (C) (Scope: Municipalities Antunovac, Čepin, Erđut, Ernestinovo, Šodolovci)	A (private)	HT	2.57	8,828	6,345
Donja Voća Municipality* (Scope: City Lepoglava and Municipalities Bednja, Cestica, Donja Voća, Klenovnik, Marušćevec, Petrijanec and Vinica)	B (public)	Donja Voća Municipality	8.57	9,422	0
UKUPNO			91.19	155,472	128,876

*Municipality Donja Voća withdrew from the project.

The target value of the coverage of households to be realised by the implementation of these projects initially included 131,445 households, in accordance with the [Operational Programme Competitiveness and Cohesion 2014-2020](#) (OPCC). In October 2023, at the meeting of the OPCC Monitoring Committee, this indicator was reduced to 118,300 households

In accordance with the data submitted by operators and project owners, at the end of Q4 2023, 128,876 households, 207,225 users and 172,542 addresses were covered within the BIDP scope. This has resulted in the coverage of almost 83% households (82.5% of users) and approximately 81% of addresses in the covered areas.

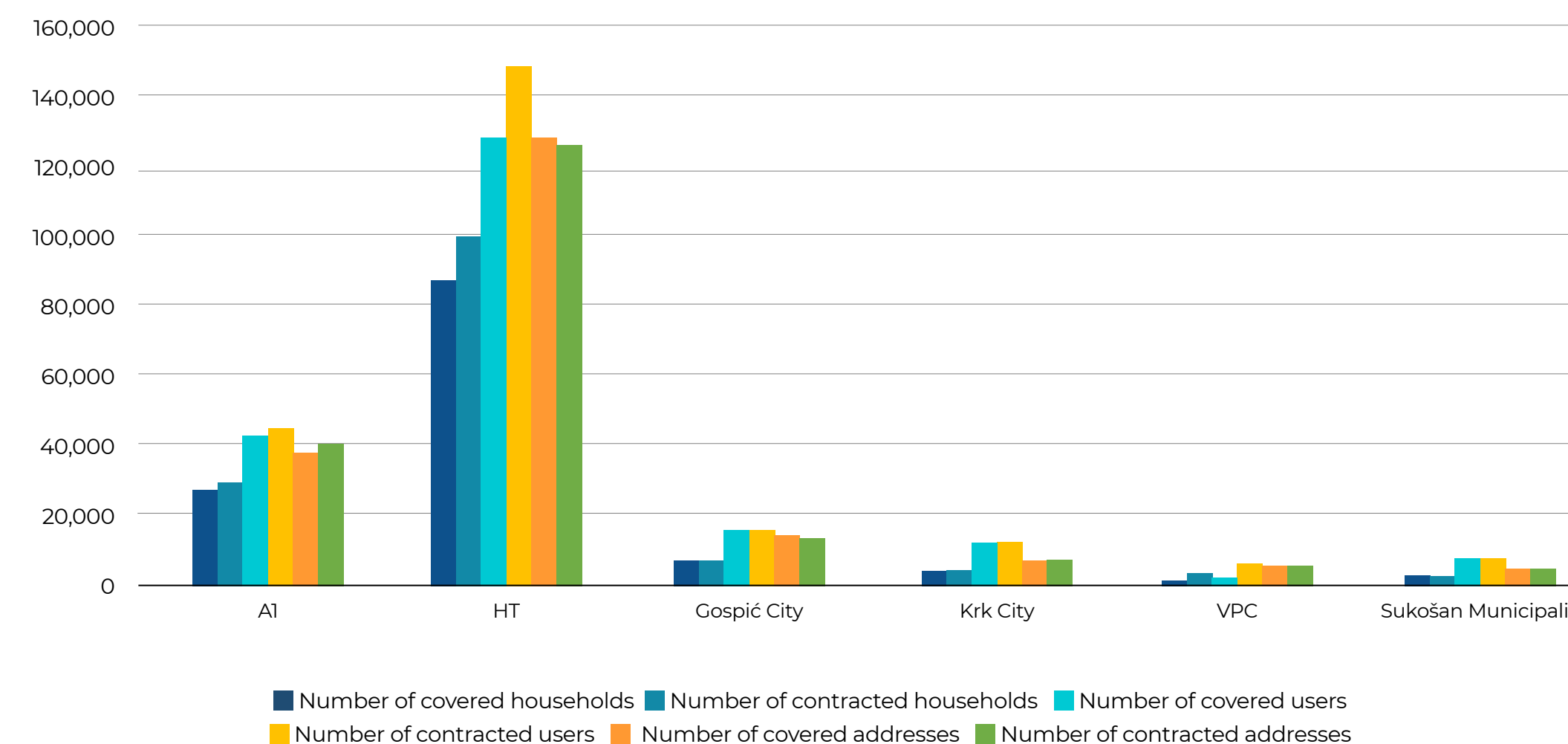
Figure 7.1 Implementation of FNP projects at the end of 2023



According to the data, at the end of 2023, the new targeted value from the BIDP was achieved and the whole programme can be considered to have been successful.

In all, six projects were completely finalised: BIDP Solin (A1), BIDP Ivanić Grad (A1), BIDP Poreč (HT), BIDP Đurmanec (HT), BIDP Zaprešić (HT) and BIDP Mursko Središće (HT). The implementation of the remaining projects will continue in 2024 using operators' own funds in projects under model A and using L(R)SU funds in projects under model B.

Slika 7.2 Comparison of contracted and realised indicators at the end of 2023.



Since most of the projects are in a high level of completion, they are expected to be completed in accordance with the signed contracts. The only exception is the BIDP of Virovitica-Podravina County that has the poorest implementation of approximately 35% according to all indicators and there is a real threat that this project is not going to be completed.

National Recovery and Resilience Plan

Under the National Recovery and Resilience Plan from 2021 to 2026 (NRRP) additional grants in the amount of EUR 106m are ensured for the continuation of the implementation of the FNP. These funds will enable the co-financing of a certain number of projects for the development of the broadband access infrastructure to the units of local and regional self-government, which were not co-financed in the financial perspective 2014 to 2020. In order to enable the continuation of the implementation of the FNP, in 2023, the CAFP continued its work on the verification and granting of the BIDPs. Eight BIDPs were granted (following the 38 of those already granted in 2022) for which certificates of their conformity with FNP structural rules were issued. In June

2023, the Directorate for EU Funds of the Ministry of the Sea, Transport and Infrastructure published the call for grants under the NRRP. All BIPDs with a valid CAFP statement had the right to participate in the procedure, 46 of them. Thirty-two BIPDs were accepted in the last round of the call and in the first quarter of 2024 co-financing agreements were signed for 21 projects, with a total share of EUR 104,744,021 of the grant. The objective of the financing of this second set of FNP projects is to ensure the availability of VHCNs for 100,000 additional households.

COOPERATION

Cooperation with international and domestic authorities is an important part of HAKOM's daily activities. Below is a presentation of key activities during 2023, divided into international and domestic cooperation. For more individual activities visit HAKOM's website.

International cooperation

HAKOM actively participates in the work of institutions and bodies of the European Union and relevant international organisations in electronic communications, postal and rail services.

European Union

HAKOM regularly monitors the procedure for the adoption of EU regulations in the EU Council preparatory bodies, in particular in the Working Party on Telecommunications and Information Society, the Working Party on Postal Services and the Working Party on Land Transport, as well as in other working parties that discuss legislative proposals within the scope of HAKOM's activity. HAKOM participates as a co-author of the national position or as a body providing comments in the EU legislative procedure.

The key legislative procedures in which HAKOM participated in 2023 include negotiations on the proposal of the Gigabit Infrastructure Act (GIA) and the proposal of the Regulation on harmonised rules on fair access to and use of data (Data Act). HAKOM participated in these procedures in the preparation of national positions. The adoption of these acts is planned in the course of 2024. HAKOM's representatives participated in the work of the following **committees of the European Commission:**

The Radio Spectrum Committee (RSC) – assists the EC in developing technical implementation decisions that ensure harmonised conditions for the availability and efficient use of the RF spectrum in the EU. The RSC also addresses measures that ensure accurate and timely delivery of spectrum usage information. Participation in the work of this Committee enables the communication of national regulators with the EC on proposals before the adoption and implementation of decisions in order to take into consideration real specificities in the RF spectrum of the member states, despite the growing harmonisation at the EU level.

The Communications Committee (COCOM) – assists the EC in the implementation of projects with the objective of building, developing, modernising and completing trans-European networks in the transport, energy and digital sectors and facilitating cross-border cooperation in the area of renewable energy.

CEF Coordination Committee

As a member of the CEF Digital Committee, HAKOM regularly monitors and participates in the implementation of work programmes within the CEF programme and provides supports to potential applicants. Within the second Call for grants under the CEF Digital programme, two project proposals were submitted and selected for co-financing, which cover the territory of the Republic of Croatia. In the area of 5G infrastructure, the feasibility study of a Croatian and Slovenian consortium was selected on the cross-border road TEN-T corridor: 5G Cross-border Deployment Study between Slovenia and Croatia on the Mediterranean Corridor. Telemach Hrvatska d.o.o. and Oiv odašiljači i veze d.o.o. are the Croatian consortium partners. HAKOM provided support to the consortium partners before and after the submission of the project proposal. As the Croatian National Broadband Competence Office (BCO), HAKOM set up regular communication with the Slovenian BCO, attempting to connect Croatian and Slovenian partners in a consortium. When applying for the project, HAKOM, as the competent body for the implementation of cybersecurity requirements, granted approval to the Croatian partners in the consortium for the purpose of applying to the Call. In the area of the 5G community the SmartPortPloče – Enhancing Public Services of Ploče Port Authority via Implementing 5G Connectivity project of the consortium of Markoja d.o.o. and the Port of Ploče was selected. For the purpose of submitting the project for co-financing, HAKOM, as the competent authority for the implementation of cybersecurity requirements approved security requirements to the Markoja d.o.o. company.

Postal Directive Committee (PDC) – monitors the application of EU postal legislation (Postal Directive and other acts) in Member States and steers the regulation of the single postal services

market. In 2023, two regular PDC meetings were held at which, in addition to the usual reports on activities in the postal sector, specific topics of discussion included sustainable operations in postal activity, declaring goods in postal parcels for customs clearance with regard to the IOSS system and the digital customs declaration as well as the need for the standardisation of the basic definitions of postal services with the objective of the single regulation of the postal market.

HAKOM's representatives were active in the work of the **expert working groups of the European Commission**, consultative bodies set up to provide the European Commission with expertise in the specific fields of work, and in particular in the work of **RSPG, HLIIG, EG112** and **ENRRB**:

Radio Spectrum Policy Group (RSPG) – a high-level advisory group assisting the EC in the development of RF spectrum policy – in particular regarding the coordination of approaches, coordinated conditions of availability and efficiency of the RF spectrum use and establishing and functioning of the internal market. The RSPG adopts opinions, positions and reports, and advises the EC at the strategic level. In accordance with the work programme, which in principle refers to the period of two years, work is organised in several sub-groups dealing with specific topics. HAKOM has been actively participating in the work of the Good Offices Sub-Group for cross-border cooperation, considering the interest of the Republic of Croatia to address several-years long Italian radio and television interferences.

Based on the request submitted by HAKOM, in accordance with Article 28, paragraph (3) of the European Electronic Communications Code (EECC), and the RSPG opinion (RSPG21-029) adopted on its basis on eliminating Italian cross-border interferences in TV networks within the 470-694 MHz band and 5G mobile communication networks within the 700 MHz, from June 2022 to June 2023, HAKOM carried out measurements and based on the (RSPG23-022) RSPG Good Offices Sub-Group for cross-border cooperation report confirmed that the mentioned UHF interferences had been eliminated.

In 2022, by using the above-mentioned good offices in resolving Italian harmful UHF interferences through EU institutions and mechanisms, in this case, applying the provisions of recital (72) and Article 45 of the EECC, with its request for good offices and the issuance of an RSPG opinion, HAKOM requested proposing a coordinated solution of cross-border harmful FM interferences caused by the Italian Republic. The above request is primarily based on the EECC provisions “that radio spectrum is a public good that has an important social, cultural and economic value, Member States shall ensure the effective management of radio spectrum for electronic communications networks and services in their territory in accordance with Articles 3 and 4 of the EECC. They shall ensure that the allocation of, the issuing of general authorisations in respect of, and the granting of individual rights of use for radio spectrum for electronic communications

networks and services by competent authorities are based on objective, transparent, pro-competitive, non-discriminatory and proportionate criteria. In applying the above, Member States shall respect relevant international agreements, including the ITU Radio Regulations and other agreements adopted in the framework of the ITU applicable to radio spectrum, such as the agreement reached at the Regional Radiocommunications Conference of 2006, and may take public policy considerations into account.” Therefore, the same obligation also refers to compliance with the provisions of the GE84 agreement for the FM radio band 87.5 MHz – 108 MHz. In 2023, the RSPG Good Offices Sub-Group on cross-border coordination worked intensively on creating preconditions for the development of the action plan with the accompanying time frame for the resolution of the mentioned issue. However, due to the delay of the Italian administration, i.e. their internal working group, to finalise the report that will serve as a basis for taking action for the resolution of the problem of cross-border harmful interferences, in addition to the guidelines of the mandatory application of European and internal rules governing the use of the radiofrequency spectrum in Italy, in 2023 no progress was recorded in the individual resolution of Italian FM interferences or in the development of plans for their systematic resolution.

HLIIG – HAKOM continued to represent the HR in the work of the High Level Group on Internet Governance (HLIIG) at the European Commission. The main task of the HLIIG is the coordination of positions of EU Member States in matters of internet governance, with a special emphasis on public interest. Participation enables a fast exchange of information and coordination with other Member States. The main topics discussed included WSIS 20+, Global Digital Compact (GDC), as preparation for the Summit of the Future, to be held in New York in autumn 2024. The main topics that were discussed included cybersecurity, the strengthening of the Internet Governance Forum (IGF), the strengthening of the multistakeholder internet governance model, the issues of human rights in the digital world, the allocation of new .eu domains and other issues with the aim of achieving a common European position for a coordinated approach of the representatives of EU Member States in the GAC Committee at the ICANN, at the IGF, in discussions that are opened within the ITU and other relevant institutions. Where necessary, for certain topics of the HLIIG, information was distributed within the HR to relevant ministries and other authorities.

EG112 – Commission Delegated Regulation 2023/444 was adopted with the goal to ensure effective access to emergency services through emergency communications to the single European emergency number ‘112’ and it entered into force on 5 March 2023. In accordance with the Regulation, HAKOM, together with the competent authorities for emergency services, prepared a national roadmap for the upgrade of capabilities of the national PSAP system to answer, handle and process emergency communications provided through packet-switched technologies. HAKOM has the obligation to regularly report to the Commission on the performance of the routing to the most appropriate PSAP. In addition, in 2023, within this expert group HAKOM experts par-

participated in EENA's workshop on the EU code on emergency communications and addressing the issue of access to emergency services through communication channels gathering around a hundred stakeholders from different institutions. Discussions were held on how to best implement the provisions of the Delegated Regulation (of 16 December 2022) supplementing the European Electronic Communications Code, which contains new rules aimed at improving the functioning and management of emergency communications in Europe.

ENRRB

The EC advisory body, which discusses issues and practices in the area of regulation of the rail services market of importance for the work of regulatory authorities. For the purposes of the work of the ENRRB, a database of cases conducted by regulatory bodies (DAREBO) was established for the purpose of the exchange of regulatory practice. In 2023, HAKOM participated in the 24th ENRRB meeting at which relevant events in the rail sector in Member States were presented.

RMMS

The European Commission has a working group responsible for monitoring the conditions in the single European market and for the collection of data on market conditions. Member States collect and submit data to the European Commission in accordance with Commission Implementing Regulation (EU) 2015/1100 of 7 July 2015 on the reporting obligations of the Member States in the framework of rail market monitoring.

By 31 December each year, Member States submit to the EC the data specified in the rail market monitoring questionnaire (TRAMOS), and every two years the EC submits the report to the European Parliament and to the Council. Thus, in September 2023, the eighth report on development of the rail market was presented, which is available at the following link: https://transport.ec.europa.eu/transport-modes/rail/market/rail-market-monitoring-rmms_en. The collected data also serve as the basis for the adoption of and amendments to the legislative framework. The obligation for HAKOM to collect and submit these data to the European Commission is prescribed in the national legislation.

Single European Railway Area Forum (SERAF)

The Single European Railway Area Forum (SERAF) is an expert group of the European Commission whose role is to give advice and provide input to the Commission during the preparation of the delegated acts/legislative acts foreseen in Directive 2012/34/EU on a Single European Railway Market, support the Commission in the general implementation and follow-up of Directive 2012/34/EU and of the related legislative acts, as well as coordination and cooperation with Member States and stakeholders in that regard and to prepare legislative proposals and policy initiatives. Three sub-groups will be active within the SERAF that will address the following specific

topics in which group members have expressed most interest: Proposal on the use of railway infrastructure capacity: how infrastructure and ENIM managers should organise consultations with stakeholders, Commercial terms and fees and the Report on the implementation of Directive 2012/34/EU, under Article 63 of the Directive.

Network of regulators (BEREC, ERGP, IRG Rail)

The EU regulatory framework for the field of electronic communications, post and rail foresees the connecting of competent national regulatory authorities in the network of European regulatory bodies, which through their activities aim at assisting the EC to harmonise the implementation of the regulatory framework.

HAKOM thus participates in the work of the following:

1. **BEREC** – the network of regulators for electronic communications
2. **ERGP** – the network of regulators for postal services
3. **IRG Rail** – the network of regulators for rail services.

BEREC – BEREC is the Body of European Regulators for Electronic Communications and acts as a forum for cooperation among national regulatory authorities and between national regulatory authorities and the EC in the exercise of the full range of their responsibilities under the Union electronic communications regulatory framework. It is a technical body with expertise on electronic communications, composed of representatives from national regulatory authorities and the Commission, with the objective to provide expertise, act independently and transparently and through its activity ensure the consistent implementation of the regulatory framework for electronic communications, within the powers governed by the BEREC Regulation ((EU) 2018/1971).

BEREC is assigned tasks such as delivering opinions on the proposals of national measures as regards market regulation, providing the necessary guidelines to national regulatory authorities and other competent authorities to ensure common criteria and a consistent regulatory approach, and keeping certain registries, databases and lists at the Union level.

In 2022, the President of the HAKOM Council, Tonko Obuljen, was elected BEREC Chair in 2024, as a result of which, in 2023, HAKOM took over the role of the Incoming Chair and was actively involved in the work and organisation of BEREC's planned activities throughout the year. As the Incoming Chair, HAKOM was responsible for organising the Stakeholder Forum (annual conference gathering market stakeholders) and for the preparation of the BEREC's Annual Work Programme 2024.

HAKOM's experts actively participated in the work of the working groups, the Contact Network, the Board of Regulators and the Management Board. In 2023, BEREC adopted about forty documents in accordance with its annual work programme.

ERGP - In 2023, HAKOM continued to participate in the work of the European Regulators Group for Postal Services (ERGP). HAKOM's experts participated in the work of various working groups that discussed and addressed the issues related to the universal service, regulatory accounting, the prices of postal services, the situation and indicators of developments in the postal services market, the quality of services, consumer satisfaction and protection, the cross-border traffic of postal items, green transition and other issues. A number of experts participated in the work as drafters, i.e. on the preparation of reports originating as a result of the work of individual working groups. In parallel, the ERGP also provided support to the EC through technical assistance and consultations that addressed future challenges in the field of the European postal system, such as the initiative to amend the Postal Directive, trends, challenges and strategic directions for the forthcoming period, and the application of new knowledge and technologies in the postal industry.

In addition to the above, HAKOM's representatives also actively participated in ERPG's plenary sessions held in Larnaca (Cyprus) in June 2023 and in Bucharest (Romania) in November 2023.

IRG Rail – jRG Rail – The IRG Rail is an organisation for cooperation, information exchange and the sharing of best practices between national railway regulators in order for them to efficiently face current and future regulatory challenges in the railway market and promote a consistent application of the European regulatory framework.

HAKOM's rail experts actively participate in the work of six working groups – Access, Access to Service Facilities, Charges, Charges for Service Facilities, Market Monitoring and Emerging Legislative Proposals and in the special Multimodality Group. In 2023, they attended more than 35 meetings, plenary meetings and network meetings and reported to the IRG-Rail's representatives concerning the situation on the rail services market in the HR.

The Report on regulation of the rail market in freight terminals and the Second Report on the Principles for the Calculation of Fees were adopted at the plenary meeting. The Spanish regulator, CNMC, was elected Vice-President of the IRG Rail for 2024.

Emerging Legislative proposals Working Group (ELP WG) – On 11 July 2023, the European Commission published the Proposal for a Regulation of the European Parliament and of the Council on the use of railway infrastructure capacity in the single European railway area, amending Directive 2012/34/EU and repealing Regulation (EU) No 913/2010. Given the comprehensiveness and importance of this proposal, the ELP WG conducted work related to the analysis of this pro-

posal and for this purpose set up a special group at the level of the whole IRG Rail. As a result of the analysis of the mentioned proposal, the document entitled General Remarks on EC Proposal for a Regulation on the Use of Railway Infrastructure Capacity in the Single European Railway Area was published in November 2023. The document entitled Views on the European Commission Initiative to Better Manage and Coordinate European Rail Capacity and Traffic Management was adopted at the plenary meeting of the IRG Rail held in May. The documents were a response to the EC's intentions with regard to the amendments to Regulation 913/2010/EU and the intention of a different regulation of the allocation of capacity and management, which would mean that these provisions should be deleted from Directive 2012/34/EU and the then published EC policy options.

Access to Service Facilities Working Group, in 2023, held nine meetings and, within the work programme for 2023, prepared a report on the scope of the regulatory framework of the railway market on port areas. The report was based on regulatory practice and certain criteria in determining the scope of influence. The group also prepared a document entitled Guidelines for the Development of Descriptions of Service Objects, which was translated into Croatian and published on HAKOM's official website.

Access Working Group held five meetings in 2023. The group's work focused on the Proposal for a Regulation on the use of railway infrastructure capacity in the single European railway area, amending Directive 2012/34/EU and repealing Regulation (EU) No 913/2010. The proposal changes the rules for rail infrastructure capacity and traffic management, for monitoring the performance of rail transport, for stakeholder coordination and for the allocation of capacity to rail traffic as part of an intermodal transport chain.

Charges Working Group held ten meetings in 2023 together with the Charges for Service Facilities Working Group. The Charges Working Group focused on the work on international rail freight services with emphasis on the differences in charges at borders, the analysis of other obstacles in cooperation with the Access Working Group, as well as the analysis of obstacles related to the charges for undertakings in order to get good TAC assessments for cross-border traffic. Among other things, the Charges for Service Facilities Working Group continued its work on updating the document on the Economic approach of charging principles referred to in Article 31, paragraph (7) and Article 31, paragraph (8) of Directive 2012/34/EU and the document on electric power for train haulage.

Market Monitoring Working Group held, in all, five meetings in 2023. The main topic at all meetings was the preparation of the twelfth annual market monitoring report. At the meetings, individual phases for the preparation of the annual report were agreed, e.g. the phase of defining the

questionnaire for the collection of data, the collection of data, data processing, determining the authors of individual chapters and the drafting of the annual report. Thus, this year, the representative of the Rail Services Sector was in charge of drafting the chapter on the rail freight market. The publication of the twelfth annual market monitoring report is expected in the beginning of April 2024. The report will at the same time be available at the following link: <https://irg-rail.eu/irg/documents/market-monitoring>.

TAIEX project the Republic of North Macedonia

At the initiative of the Postal Regulatory Agency of the Republic of North Macedonia, organised by **TAIEX (Office of the EC for Technical Assistance and Information Exchange)** as part of expert mission 84540, in October 2023, HAKOM's experts in the field of postal services held a mission with the representatives of the regulatory agency and the Ministry of Transport and Communications of North Macedonia with the objective/mission of expert technical assistance and the transfer of knowledge with regard to the transposition, implementation and practical application of Regulation (EU) 2018/644 on cross-border parcel delivery services in the national legislation.

Electronic Communications Committee (ECC) – the Electronic Communications Committee is the umbrella organisation within CEPT responsible for the adoption of decisions and recommendations in the field of electronic communications important for the management of the RF spectrum and numbering space. The ECC also cooperates closely with the European Commission in preparing the technical basis of EC decisions related to the field of electronic communications. The ECC oversees the work of the WGFM, WGSE, ECC PT1, CPG and NaN working groups. In 2023, HAKOM regularly monitored the work of the ECC and implemented a series of adopted decisions and recommendations in national regulations. CEPT activities in 2023 focused on the final preparations for the World Radiocommunication Conference (WRC23). Before the conference itself, in 2023, at the CPG working group two sets of common European positions (ECP) were adopted by which European countries defined their input positions for the WRC23.

Working Group Frequency Management (WGFM) – The task of the working group is the harmonisation of the utilisation of the RF spectrum to enable a constant development of its use in the areas of mobile, fixed, maritime, aviation (including unmanned aerial vehicles), satellite and short range communications. In 2023, HAKOM regularly participated in this working group's meetings.

FM22 Project Team for RF spectrum monitoring – The FM22 Project Team is part of the WGFM Working Group and deals with the topic of control and monitoring of the RF spectrum. HAKOM's representatives participated in developing harmonised measurement techniques and procedures for the monitoring of the RF spectrum in 2023.

FM44 Project Team for satellite communications – The FM44 Project Team is part of the WGFM and deals with the issues of satellite communications. Given the intensified development of new satellite systems, HAKOM participated in the work of this project team having in mind the impact of new satellite systems on the existing microwave and satellite connections in the HR. From 9 to 11 May 2023, HAKOM successfully hosted the 73rd FM44 Project Team meeting in Zagreb. As part of the event, the meeting of EU countries was held at which the latest version of the draft administrative agreement USC/IRIS2 (Union Secure Connectivity programme/Infrastructure for Resilience, Interconnectivity and Security by Satellite) was presented through which the EU intends to implement a safe satellite communication backbone among EU Member States.

SRD/MG Project Team (Short Range Devices/Maintenance Group) – The SRD/MG is another project team within the WGFM responsible for managing the use of the radiofrequency spectrum for the needs of a large number of short-range devices (SRD). Short-range devices (SRD) are present everywhere in different professional activities or used for private purposes, so that new types are constantly appearing in the market or the existing ones are changing. The importance of the SRD industry for the European Union has also been recognised by the European Commission, which charged the CEPT with a regular updating of SRD devices regulation, and Member States are regularly required to implement these regulations in their national frameworks. Therefore, HAKOM's participation in the work of this project team was also one of the priorities in 2023.

Working Group Spectrum Engineering (WGSE) – The ECC working group is responsible for the technical issues of RF spectrum management. HAKOM also participated in two meetings held in 2023. The working group is tasked with the analysis of the possibilities of sharing and a joint use of the RF spectrum between the mobile, fixed and satellite services and short-range devices.

SE19 Project Team for fixed service – The Project Team, which is part of the WGSE, is responsible for the development of channel arrangements for the fixed service, the issues of sharing the spectrum in the bands allocated to this service, the issues of new technologies in the fixed service and the development of new methodologies for the assessment of the level of interference on the fixed service from other radiocommunication services. HAKOM also participated in the work of this project team in 2023.

SE21 Project Team for the issues of unwanted interferences – The Project Team is responsible for the issues of unwanted and spurious SE21 emissions and, among other things, it is also responsible for the issues of measurements of adaptive antenna systems on site, i.e. outside laboratory conditions. Adaptive antenna systems are part of the 5G mobile network base stations. Given the

importance of the topic, HAKOM continued to follow the work of this project team in 2023.

HCM Agreement – HCM (Harmonized Calculation Method) is an international agreement for the coordination of radio frequencies in the mobile and fixed services, also signed by the HR. In 2023, HAKOM participated in the work of the HCM TWG working group, tasked with the adjustment and amendments in the agreement in accordance with the development of radio technologies of microwave connections and mobile systems.

Conference Preparatory Group (CPG) – In 2023, this working group within CEPT held its three last meetings before the World Radiocommunication Conference (WRC23). HAKOM also participated in its work. The group's main task was preparing common European positions for the WRC23 representing CEPT's compromising position regarding 35 topics for the WRC23 from all areas of radio communications. The positions were prepared in two sets – at the group's meetings held in May and in September.

CPG PTD (CEPT) – Within the preparations for the 2023 World Radiocommunication Conference as one of the key topics HAKOM has recognised the topic on the agenda under which the future of the UHF frequency band (470 – 694 MHz) in Region 1 should be agreed. This band is currently used for broadcasting in the ITU Region 1, including Croatia, and the possibility of introducing a mobile service, i.e. the IMT, into the band was discussed at the World Radiocommunication Conference. Given the importance of the topic, HAKOM also participated in the work of this project team in 2023.

CPG PTB (CEPT) and ITU WP4A – The B (PTB) project team within the CPG working group is responsible for satellite communications, as the ITU's WP4A working group also deals with the equitable use of satellite orbits and the RF spectrum for the fixed-satellite service and the broadcast satellite service. HAKOM actively participated in the work of both groups, in particular following topic E under item 7 of the agenda of the WRC-23. Under this topic and the item on the agenda HAKOM advocated for the amendments to the provisions of Appendix 30B to the ITU Radio regulations to be made so that countries that so far have not had a geostationary-orbital position assigned for national coverage in the fixed-satellite service should have minimum satisfactory technical parameters in the international harmonisation. The positions advocated for by HAKOM were confirmed at the WRC-23.

WG NaN – HAKOM monitored and participated in the work of the ECC Numbering and Network Working Group (WG NaN), which is responsible for the development of policies in numbering,

appointments and addressing, and for providing advice on technical regulatory matters to provide incentives and support innovations and competition in electronic communications.

Cooperation among Member States

ADCO RED – European cooperation on market surveillance takes place through informal groups of market surveillance authorities, called Administrative Cooperation Groups (AdCos). EU Member States appoint the members of these groups who represent national authorities competent for market surveillance. ADCO RED deals with surveillance in relation to the Radio Equipment Directive and HAKOM's representative regularly participates in the work of this group.

European Network and Information Security Agency (ENISA) – In 2023, HAKOM became the Co-Chair of the European Competent Authorities for Secure Electronic Communications (ECASEC), which serves as a platform for collaboration and exchange of information among the national authorities supervising electronic communication security in Europe.

NIS Cooperation Group – In the Network and Information Systems (NIS) Cooperation Group, with the assistance of the EC and ENISA, the Member States monitored the implementation of a Toolbox with a common set of measures that can mitigate the main cybersecurity risks of 5G networks (5G Toolbox), as well as new activities in the area of network security and resilience initiated based on the call from Nevers.

NEB – HAKOM is a member of the network of national authorities for the enforcement of the Regulation on Rail Passengers' Rights and Obligations, which, once a year and under the auspices of the EC, exchange experiences with the aim to establish best practices for the protection of rail passenger rights, their harmonisation and propose changes to the legislative framework. HAKOM participated in the Plenary meeting at which EC representatives presented proposals for the amendments to the legislation in the area of obligations and rights of passengers in the air, road, maritime and rail transport with the aim of strengthening and unifying passenger rights.

ITU

The International Telecommunication Union (ITU) is the umbrella international organisation in the area of information and communication technologies and services as well as the oldest specialised agency within the United Nations. In 2023, through remote access, HAKOM participated in the second WRC-23 Conference Preparatory Meeting (CPM), in particular following topic E under item 7 of the agenda of the WRC-23. Under this topic and the item on the agenda HAKOM advocated for the amendments to the provisions of Appendix 30B to the ITU Radio regulations to be made so that countries that so far have not had a geostationary-orbital position assigned for

national coverage in the fixed-satellite service should have minimum satisfactory technical parameters ensured in the international harmonisation. The positions advocated for by HAKOM were confirmed at the WRC-23. In addition, in 2023, HAKOM's experts also participated in the work of the working groups within the ITU (for example, WP4A, TG 6/1).

Also, ITU BR (Radiocommunication Bureau) organised periodic multilateral radiofrequency coordination meetings among Italy, France, Croatia, Malta, Slovenia and Switzerland, to continue work with the aim to resolve the several-year long problem of Italian interferences to radio and television networks of the above mentioned countries. With a confirmation of the solution to TV interferences, unfortunately, FM radio interferences to the neighbouring countries were still not eliminated.

ICANN (GAC)

As a representative of the HR, HAKOM continued to participate in the work of the Governmental Advisory Committee (GAC) within the Internet Corporation for Assigned Names and Numbers (ICANN) organisation. The GAC is an advisory committee with the main task to ensure the protection of public interest in matters of internet governance. The main topics in 2023 related to the issues of privacy in the WHOIS service, improvements in the governance processes used at the ICANN and the issues of the protection of human rights in such processes as well as the issues of the protection of geographical and other protected names in the TLD domains assignment processes. In 2023, HAKOM coordinated the proposals of HR positions with relevant ministries and with CARNet as the .HR top-level domain manager.

EMERG

The European Mediterranean Regulators Group (EMERG) is a body that through its activities attempts to apply BEREC's manner of work to the broader Mediterranean region. It mostly comprises the Mediterranean countries, as well as other countries (23 in total). HAKOM has been a full member of EMERG since 2015, and it has participated in the plenary sessions, workshops and meetings organised by EMERG.

NATO

HAKOM participated in NATO's international exercise "Cyber Coalition 2023", represented by the Cyber Command on behalf of the Republic of Croatia. The goal of the exercise is a continued improvement of coordination and collaboration among nations and strengthening cyber defence capacity, preparing cyber experts for real-life cyber challenges, such as increasingly frequent attacks on critical infrastructure.

OECD

In January 2022, the OECD Council decided to open the accession process with the Republic of Croatia, and in June 2022 adopted the Accession Roadmap. A Negotiating Group for the accession of the Republic of Croatia to the OECD was formed. Representatives of all relevant bodies of state administration, including HAKOM, participate in its work. In 2022, HAKOM participated in the process of preparing the initial memorandum and in 2023, in the technical survey procedures conducted by the relevant OECD committees, in particular the Committee on Consumer policy, Competition Committee, Regulatory Policy Committee, Committee on Financial Markets and Committee on Digital Economy Policy.

Domestic cooperation

Ministry of the Sea, Transport and Infrastructure – In 2023, following held public consultations, HAKOM agreed the signing of the common European positions with the MSTI for the World Radiocommunication Conference WRC-23. HAKOM and the MSTI also jointly participated in the WRC-23.

The MSTI leads a Working Group established as part of the project for the establishment of a hybrid mobile virtual operator Mission Critical in the ownership of the Republic of Croatia. A series of meetings were held within the Working Group about the drafting of the proposal of the Ordinance on the conditions of provision of access and precedence in the use of electronic communications services. The ordinance should enable the implementation of the critical communications system for the needs of state administration bodies responsible for the tasks of defence and national security, internal affairs and civil protection tasks, competent security and intelligence agencies, legal entities competent for the security in air traffic, maritime traffic and inland waterway shipping and emergency services.

HAKOM also continually cooperates with the MSTI in the area of the railway market. Thus, meetings of the working groups for the preparation of the Draft proposal of amendments to the RA and the ARRSM were also held in 2023. Amendments to the ARRSM are in the procedure of public consultations. The main reason for the amendments was the new Implementing Regulation (EC) No 782/2021 on rail passengers' rights and obligations.

In 2023, HAKOM's representatives were included in the working group for the preparation of the draft proposal of the Ordinance on the assessment of security risk of producers and suppliers of the equipment for electronic communications networks.

Ministry of Health – HAKOM continued cooperation with the Ministry of Health on the issues of electromagnetic fields. Measure M3 of the National Plan for Broadband Development concerns

the information and education of the public on electromagnetic fields. Both HAKOM and the Ministry of Health are responsible for its implementation. Within the implementation of the activities defined by measure M3, long-term activities have been agreed that will result in the common system for the collection of data of authorised companies and a larger number of publicly available information of improved quality. In 2023, HAKOM prepared educational materials (animations, infographics, video materials) to be used in the communication with the public in the future.

Ministry of the Interior –

CERT – In 2023, HAKOM cooperated with the National CERT with regard to computer security incidents reported by operators in 2023. Operators continue to report computer security incidents to the PiXi Platform in a timely manner, in accordance with the Ordinance on the manner and time limits for the protection of security and integrity of networks and services, based on the criteria described in the National taxonomy for computer security incidents.

Consumer protection associations – For years, HAKOM has cooperated with consumer protection associations and shared knowledge and experiences with all interested parties, which, in addition to regular dialogues with the associations also includes lectures/consultations for consumers. In 2023, noteworthy was the cooperation with the Croatian Consumer Protection Association (HUZP), the Consumer Association (*Potrošač* in Croatian), Međimurje Consumer, the Association of the Consumers of Međimurje (ROZP), Varaždin Consumer, the Consumer Protection Association of the City of Samobor, the Association for the Protection of the Consumers of Croatia (*Potrošačica* in Croatian), the Consumer Protection Association of the County of Bjelovar-Bilogora, the Consumer Centre Association Rijeka, the Consumer Protection Centre of the Vukovar-Srijem County - Voice of Consumers, the Dalmatian Consumer Association, the Split Consumer Association and the Association for Consumer Education, Protection and Information e-ZIP.

Ministry of the Economy and Sustainable Development – HAKOM cooperates with the Ministry of the Economy and Sustainable Development in the area of consumer protection and has its representative in the National Consumer Protection Council. A part of this cooperation also refers to the “Do not Call” Register.

Croatian Railway Safety Agency and Air, Maritime and Railway Traffic Accidents Investigation Agency

HAKOM has several-year long cooperation with the Croatian Railway Safety Agency, the body responsible for the safety and interoperability of the railway system with the aim of preventing

distortion of competition or for traffic safety, as well as with the Air, Maritime and Railway Traffic Accidents Investigation Agency. On 18 April 2023, the two agencies co-organised the conference entitled Ten Years since the Liberalised Railway Transport Market in the HR, and on 26 October 2023 the conference entitled Impact of Infrastructure Quality on Rail Transport.

Government Legislation Office – Cooperation mostly related to the project “Strengthening the capacity for the implementation of regulatory impact assessment”, which enables the Government Legislation Office of the Republic of Croatia and HAKOM to perform practical regulatory impact assessment, develop better regulations and make optimal decisions in the interest of citizens and the economy. The project was successfully closed in November 2023.

CSODDS - Cooperation between the Central State Office for the Development of the Digital Society (CSODDS) and HAKOM was very intensive and productive in 2023. Having in mind the digital transformation of the society, close links between electronic communications and digital transformation and numerous legislative activities of the EC (Gigabit Infrastructure Act, Data Act, Digital Markets Act, Artificial Intelligence Act, etc.), HAKOM assisted CSODDS as the central state authority in charge of EU digital acts. Cooperation also included numerous other activities, such as the preparation of the national report for the first Digital Decade report.

PUBLICITY OF HAKOM'S OPERATIONS

HAKOM tries to be as transparent as possible in its work by ensuring the availability of information in accordance with the regulations in effect in the HR. Public access is only restricted in the cases of the protection of privacy and official or business secrets. All relevant information, including HAKOM's decisions and rulings, was regularly published on the website. Information on administrative acts and court decisions are also updated regularly. Consultation with the public is always conducted for the decisions that might have a significant impact on the market. A total of eighteen consultations were initiated in 2023. News and press releases on important events and regulations were published on nineteen occasions. HAKOM regularly cooperates with the media, through participation in shows that inform the public on the topics of protection of the users of electronic communications. During the year there were 89 queries submitted by the media, of which 29 were requests for appearances in shows or making statements. Direct contact for citizens is enabled by phone, the internet application and e-mail. However, HAKOM also uses social media, such as Facebook, LinkedIn and YouTube for communication and provision of useful information. In 2023, eighteen requests for access to information were received and resolved and the implementation report was submitted to the Information Officer.

COURT PROCEEDINGS

Court proceedings include administrative disputes initiated against HAKOM's decisions, misdemeanour proceedings initiated by HAKOM against natural and legal persons due to the violations of legislative provisions within HAKOM's competence, enforcement proceedings against legal and natural persons for the non-payment of fees for the right of use of addresses, numbers and the RF spectrum (State Budget) and for HAKOM's work as well as procedures where HAKOM applied for its claims against a debtor upon whom pre-bankruptcy or bankruptcy proceedings have been initiated.

Administrative disputes

No appeal is allowed against HAKOM's decisions adopted in administrative proceedings, but judicial protection is provided as part of an administrative dispute. An administrative dispute is initiated by filing a lawsuit with the competent administrative court.

The High Administrative Court of the Republic of Croatia is competent for administrative disputes initiated against decisions adopted by the Council of HAKOM in the field of electronic communications, postal and rail services, and against decisions adopted by HAKOM's inspectors in the cases of very serious and serious violations of the ECA and serious violations of the PSA.

First instance administrative courts (Zagreb, Osijek, Rijeka and Split) are competent for administrative disputes initiated against decisions adopted in disputes between the users of electronic communications services and postal services and operators (service providers) and regarding the protection of passengers' rights, as well as against the decisions of HAKOM's inspectors for other violations of the ECA and the PSA, as well as the violations of the ARSM.

Figure 7.3 Statistics on administrative complaints

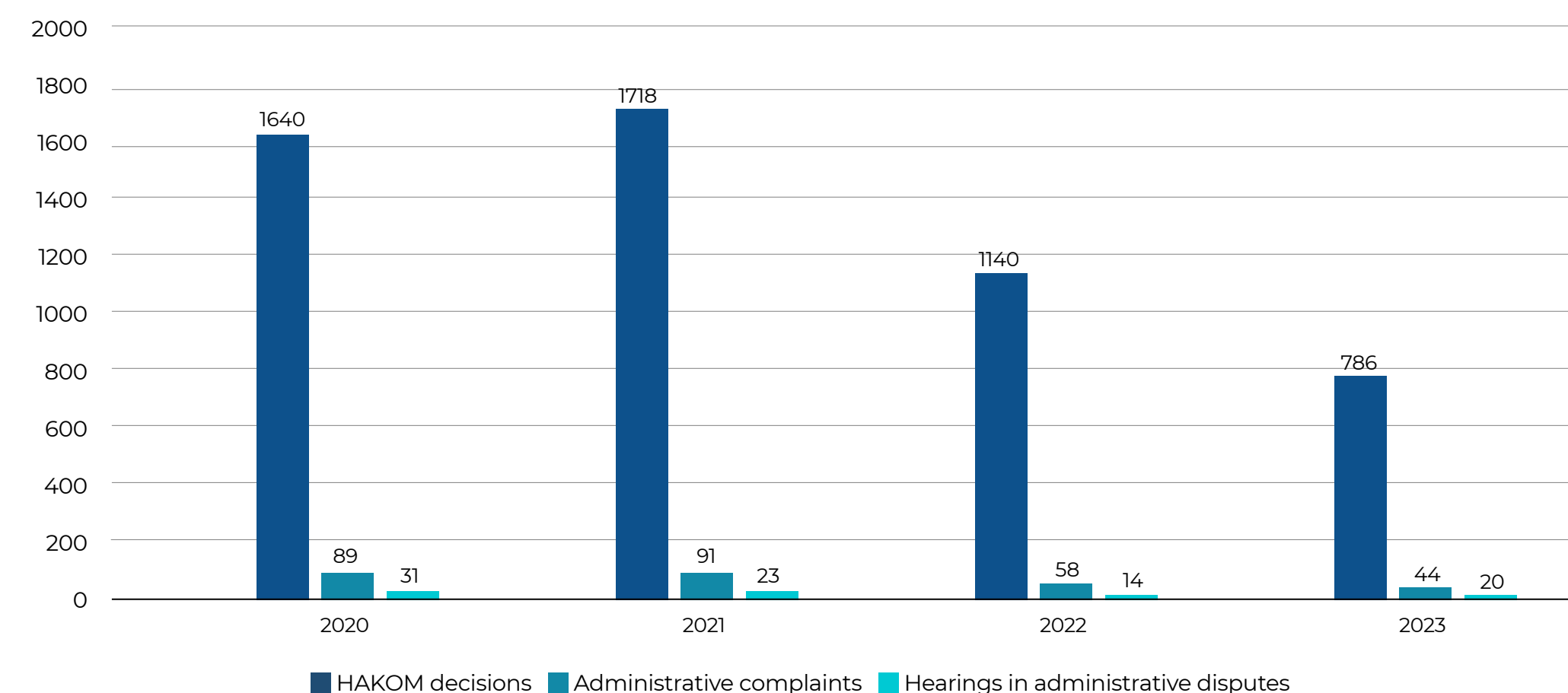
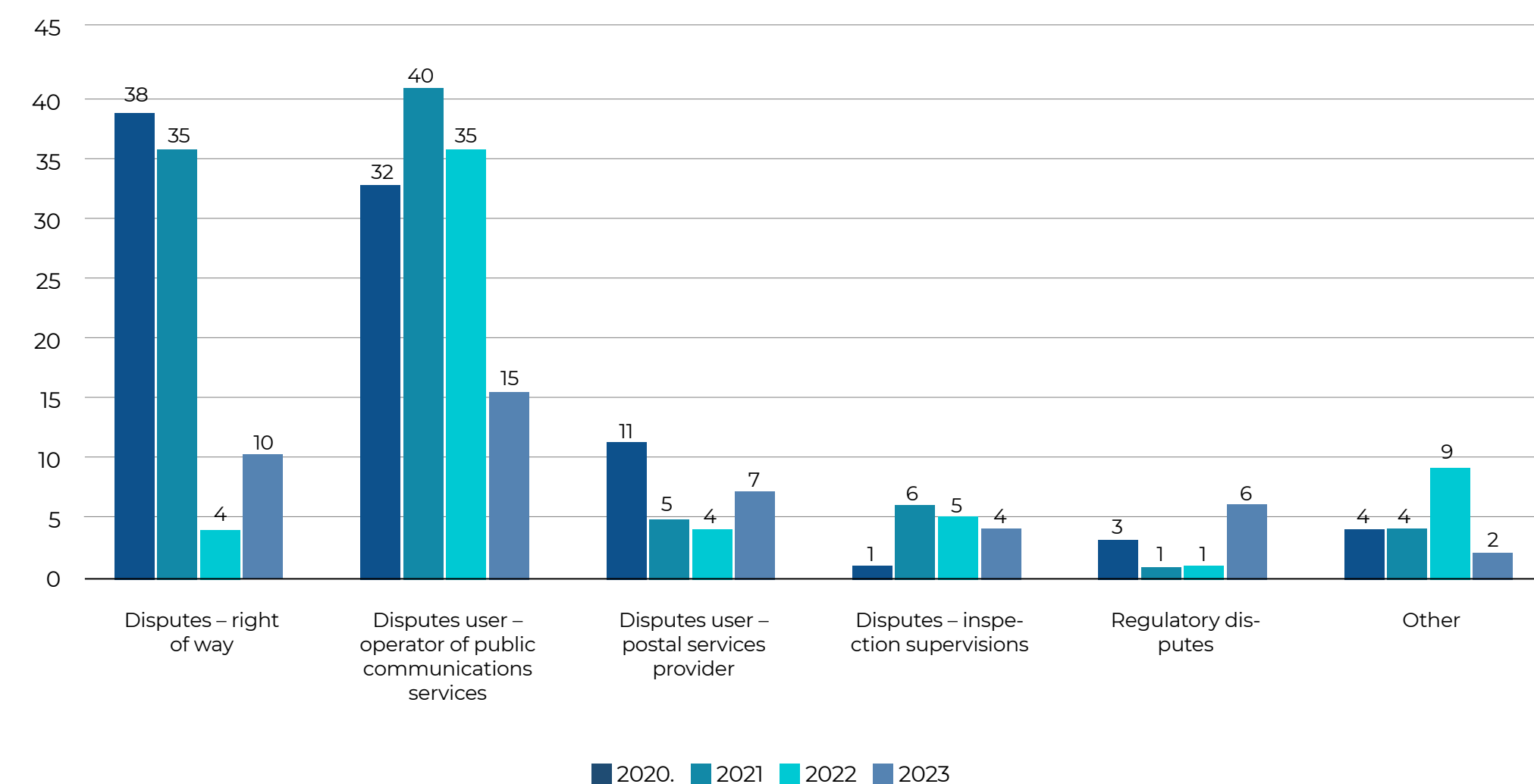


Figure 7.4 Number of administrative complaints by type of decision



The largest number of administrative complaints, 15 (34 percent), was filed in the cases of resolving disputes between users and operators of public communications services. In 2023, HAKOM resolved 690 disputes between users and operators of public communications services, so that the number of filed complaints relative to the number of resolved disputes was merely 2 percent. In the cases for determining the infrastructure operator and the right of way fee there were ten complaints (23 percent) filed, six more than in the previous year. The remaining 19 complaints (43 percent) were filed in the cases of inspection supervision (four), in the disputes between users and postal service providers (seven), in regulatory disputes (six) and in other cases (two).

In total, 55 (86 percent) HAKOM's decisions were confirmed, while nine (14 percent) HAKOM's decisions were annulled. The majority of the confirmed (32) and annulled (7) decisions refer to the cases for resolving disputes between users and operators of public communications services. It is important to mention that the HR, with the average duration of court proceedings conducted by applying the ECA of around 530 days, is ranked the 14th in the [EU Justice Scoreboard](#) statistics according to the efficiency of proceedings.

A comparative detailed overview of the duration of court proceedings conducted by the national courts of the EU Member States is shown in the figure below.

Figure 7.5 Statistics on judgements in administrative disputes

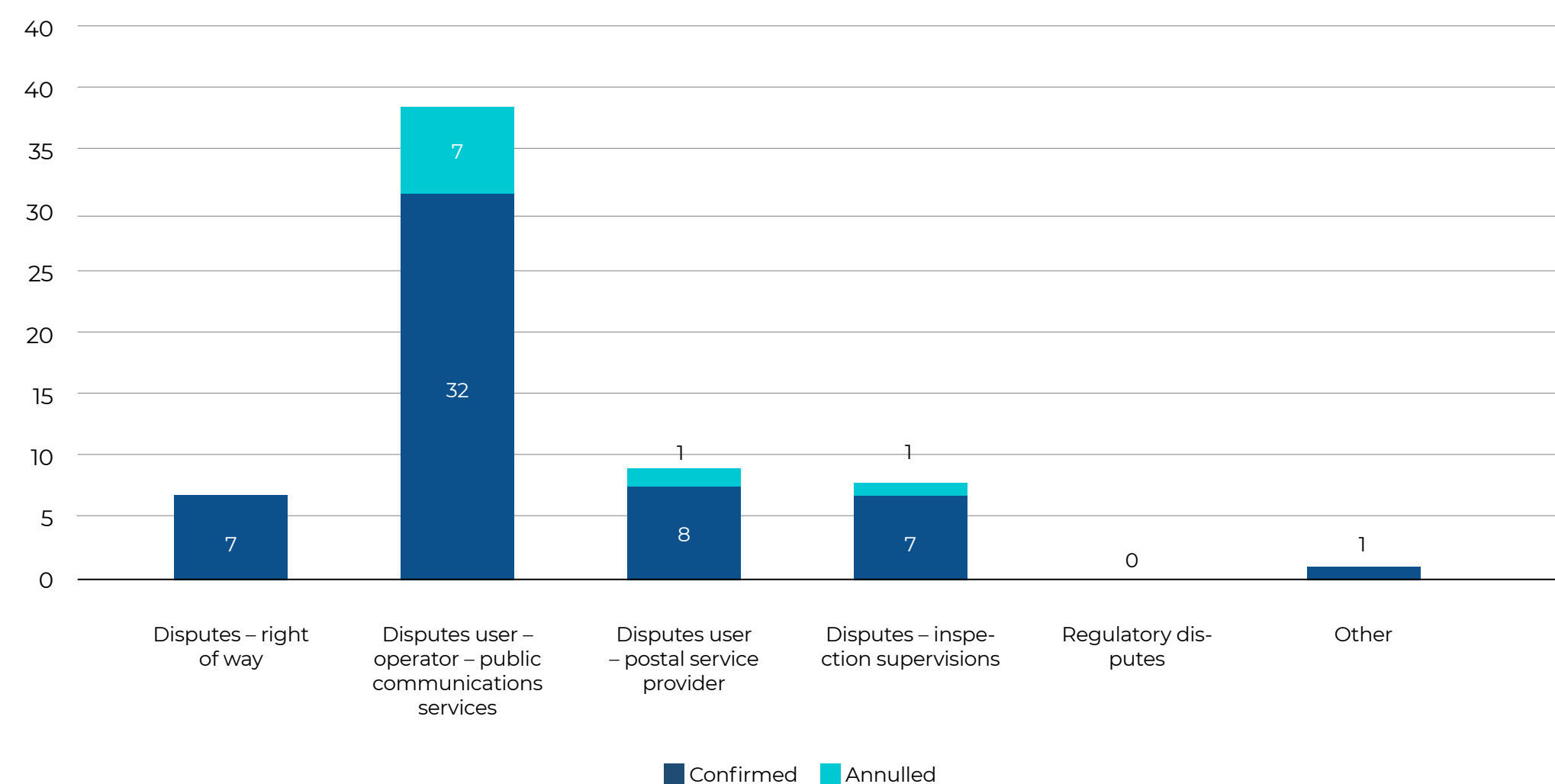
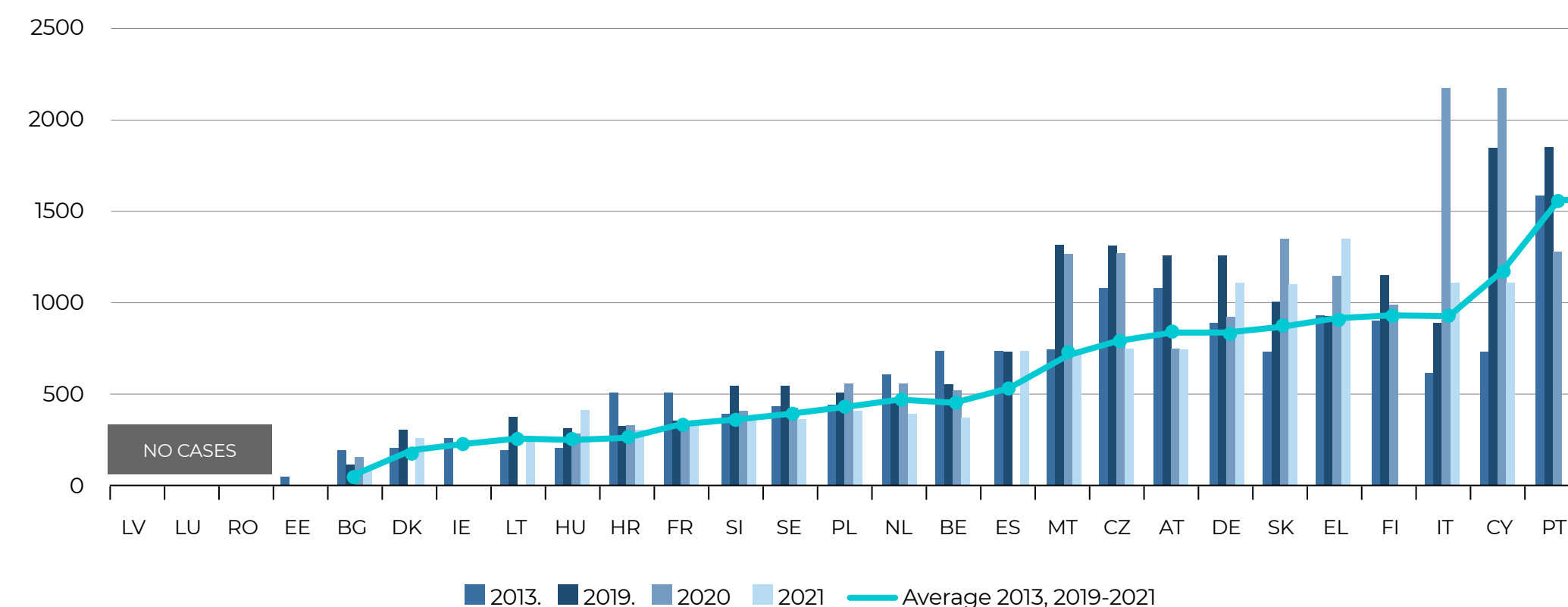


Figure 7.6 Duration of court proceedings in electronic communications



(Source: The 2023 EU Justice Scoreboard)

Misdemeanour proceedings

In 2023, five judgements were adopted, two of which were final. Three procedures are still ongoing before the High Misdemeanour Court of the Republic of Croatia. Of all the adopted judgements, noteworthy is the first instance judgement of the Municipal Misdemeanour Court in Zagreb, reference number: Pp-13927/2022, by which HT was found guilty and fined with the amount of EUR 5,978,713.25 for the violation of regulatory obligations, but the proceedings in question were suspended because the misdemeanour prosecution became statute-barred.

Four other proceedings for the violation of regulatory obligations are still ongoing. Other procedures are conducted for the following misdemeanours: failure to provide postal services in the prescribed manner, breach of the obligation to report a security incident, violation of regulations on the minimum agreed speed of broadband Internet and the use of the ECI without a contract. A settlement was reached in one case in which the operator admitted guilt and was imposed a fine in the amount of EUR 22,000.00.

In 2023, HAKOM filed seven motions for indictment in the field of electronic communications and post.

Enforcement proceedings

In 2023, based on enforcement proceedings initiated in the total amount of EUR 2,066.25, the amount of EUR 673.60 was collected, while for the remaining amount, the enforcement collection is still pending.

In 2023, the amount of EUR 1,334.81 was also collected based on enforcement proceedings initiated in the previous years.

e-AGENCY

The e-Agency programme is based on the digitalisation of operation, which requires numerous application systems. Application systems are designed for external and internal users and are especially important for HAKOM's operations. HAKOM is constantly working on improving and modernising the existing application systems and introducing new ones. Continuous investments are also made in the maintenance and upgrading of the IS/IT infrastructure to enable the operation and development of all application systems.

In 2023, the e-Licences system was upgraded, fully modernised with three new services for the users of HAKOM's services set up, i.e. three types of e-Licences: for mobile, fixed and amateur radio stations.

The new ERP system was also implemented. For the purpose of improving organisational and financial efficiency, HAKOM implemented the new ERP system, which also includes the integration of a new accounting programme. Thus, the efficiency of the posting and financial reporting process has been raised, which will result in improved employee performance and a more efficient financial management and control.

In developing the e-Agency, HAKOM carried out a number of activities and measures in 2023 with the aim of increasing cybersecurity and reliability of its external and internal services, wishing to respond well to the growing security threats in the cyberspace. Actions were frequently implemented with the objective to raise awareness among employees of the importance of cybersecurity and check the current situation of the cybersecurity of HAKOM's information system.

In-house trainings of employees on information security were held as part of operation in the digital environment of the e-Agency. The aim of the education was to raise awareness of information security, strengthen the knowledge and perception of the importance of ensuring the security of data and information and other information assets, with special emphasis on the new working environment (remote working...).

COMPETENCE AND BUSINESS DEVELOPMENT

In order to fulfil its key strategic goal, achieve business and operational excellence and foster organisational growth and development, in 2023, HAKOM continued the implementation of its several-year long project of the development of organisational culture. The main objective of this project is to promote constructive organisational culture that motivates employees for learning and development to be able to face current and future challenges and be competitive in the EU and domestic electronic communications, postal and rail services markets.

The project Strengthening the Capacity for the Implementation of Regulatory Impact Assessment was completed in 2023, enabling HAKOM, the Government Legislation Office of the Republic of Croatia and government administration bodies to perform practical regulatory impact assessment, develop better regulations and make optimal decisions in the interest of citizens and the economy. The objective of HAKOM's part of the completed project was to develop a practical methodology and a toolbox for a systematic assessment of regulatory activity in the mar-

kets of electronic communications, postal services and rail transport and to ensure a systematic approach to the assessment of potential impacts of the proposed regulation or policy prior to its implementation. Through the implementation of this project HAKOM has joined currently rare regulatory authorities in the European Union that systematically use the Regulatory Impact Assessment (RIA) in the process of adopting important decisions.

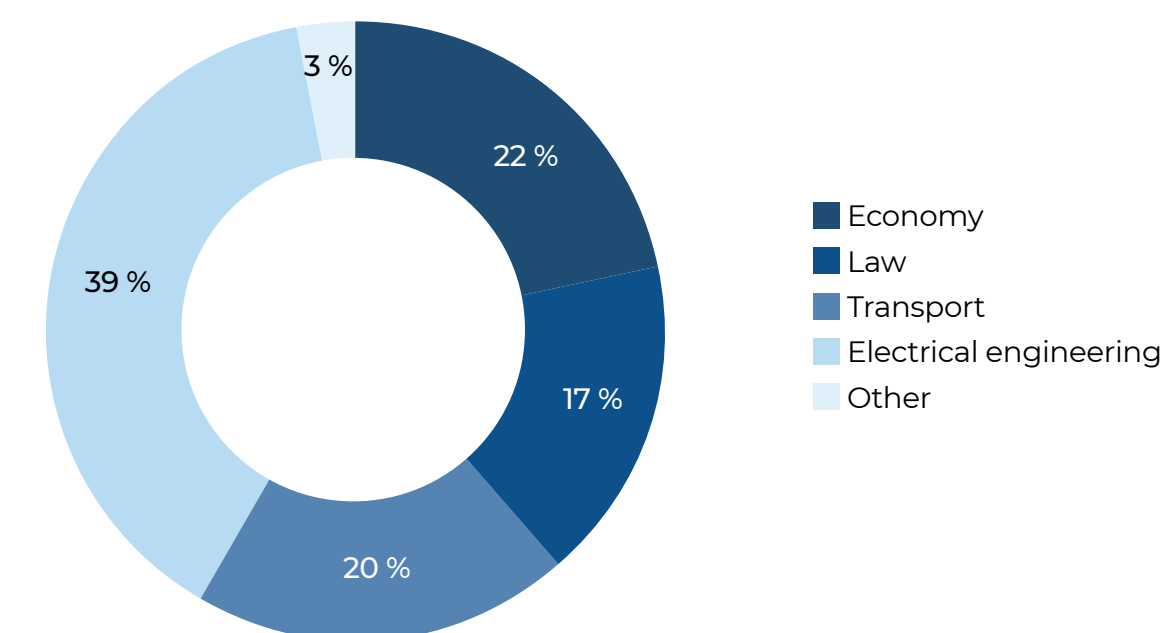
During the year, HAKOM continued to invest in its employees' gaining new knowledge and skills and implemented a systematic approach to the development of competences.

Work was continued on the improvement and upgrading of the employee performance assessment management process, which represents the key step in improving human resources management within HAKOM, as well as on upgrading the catalogue of personal, general and specific competences of HAKOM.

STAFF

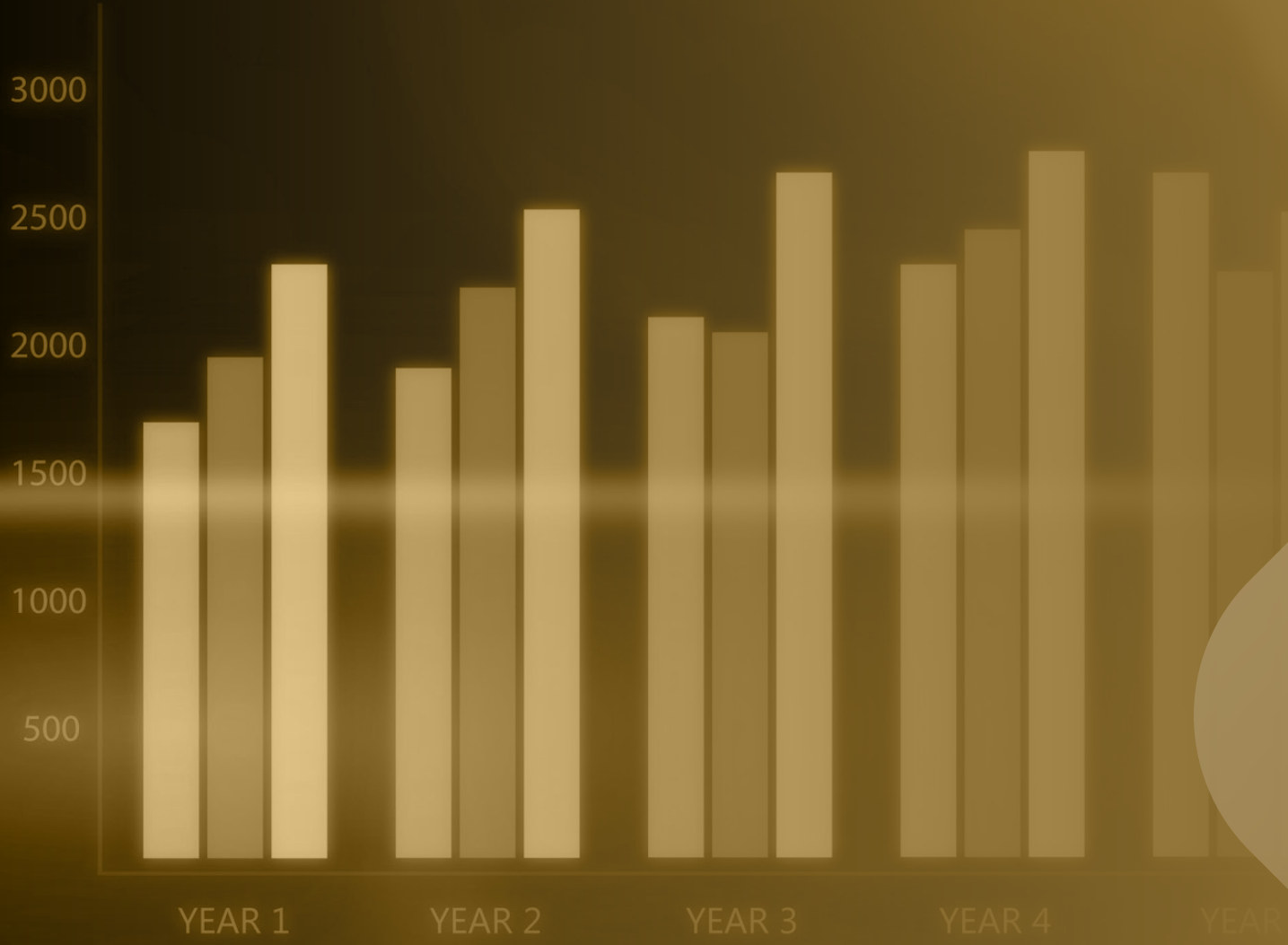
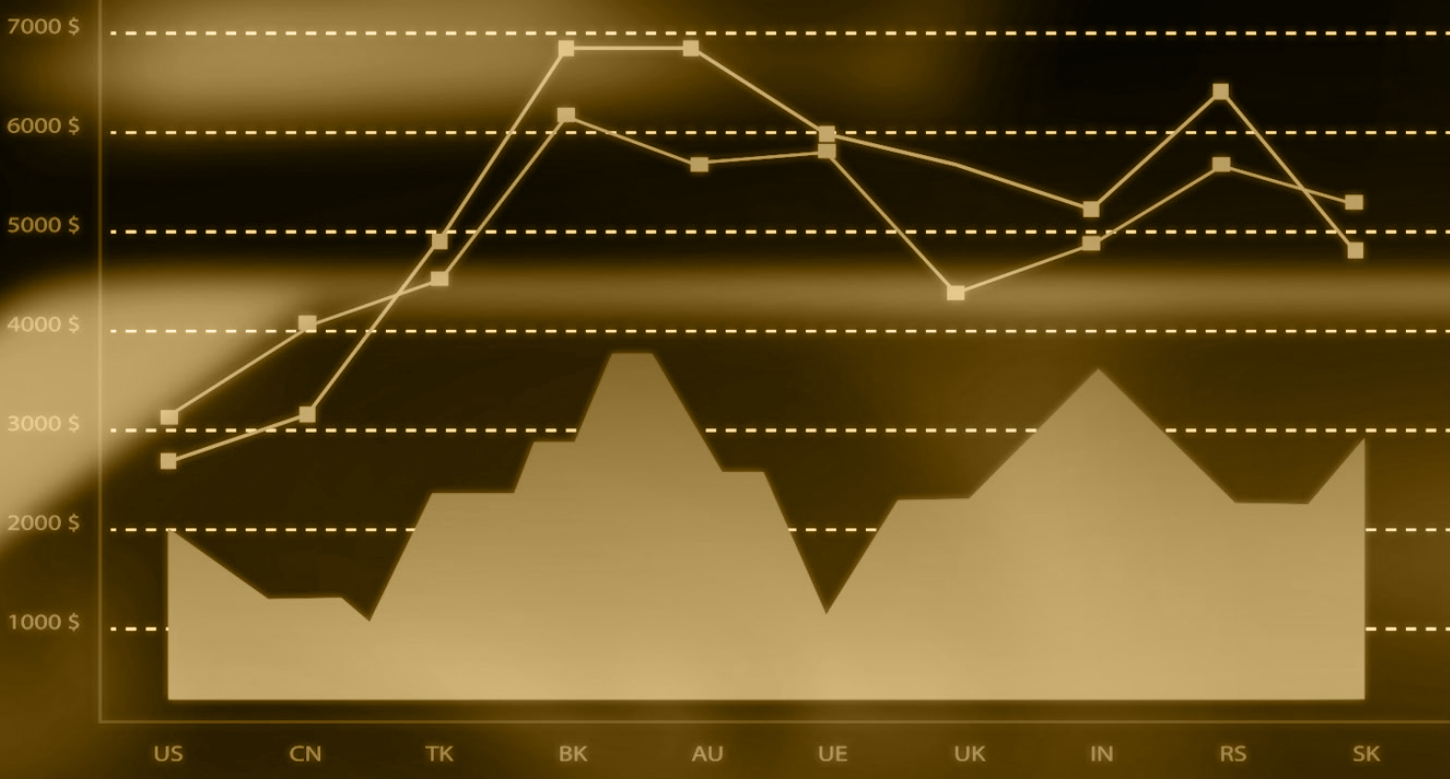
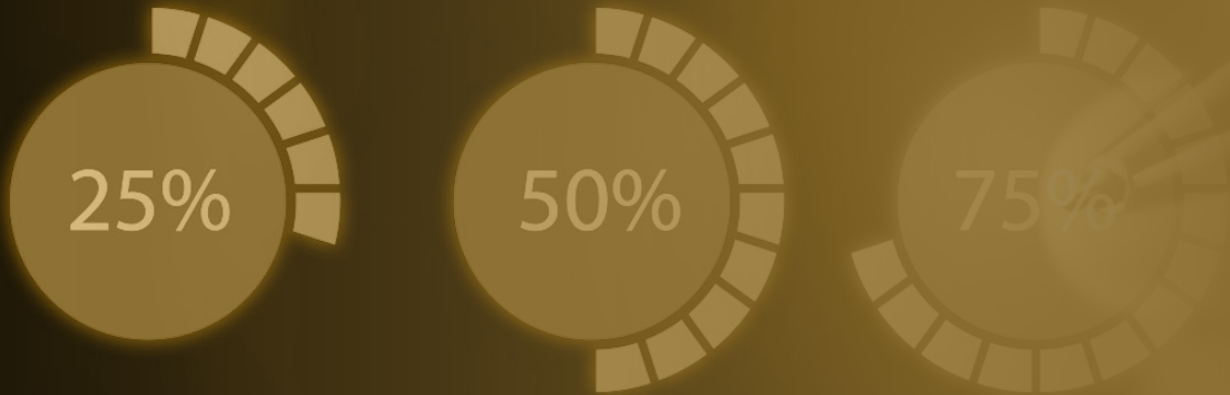
HAKOM is managed by the Council consisting of five members, while the administrative service is governed by the Executive Director who is accountable to the Council for his work. The administrative service carries out expert, administrative and technical tasks and is organised in accordance with the Statute and other HAKOM's internal rules. At the end of 2023, HAKOM had 188 employees, of which 139 had completed university or specialist graduate studies. Of this number, 4 percent of employees have completed postgraduate university doctoral studies, 12 percent of employees hold postgraduate master of science degrees, and 29 percent of employees have completed postgraduate professional studies. Since HAKOM is the national regulatory authority for the performance of regulatory and other tasks in the field of the electronic communications, postal and rail services, HAKOM is primarily represented by engineering professions and experts in the legal and economic fields. Thirty-nine percent of employees have higher education in the field of electrical engineering, 22 percent in economy, 20 percent in the field of transport engineering, and 17 percent in law. The rest of the employees have other professions. Twenty-seven employees have completed university and specialist undergraduate studies, and 22 employees have completed secondary education.

Figure 7.7 Structure of employees according to fields



08

FINANCIAL STATEMENT



INTRODUCTION

The Croatian Regulatory Authority for Network Industries (hereinafter: HAKOM), pursuant to Article 20, paragraph (1), sub-paragraph (6) of the Electronic Communications Act (Official Gazette 76/2022 and 14/2024; hereinafter: ECA) and Article 10 of the Statute of HAKOM (Official Gazette 40/2024), submits to the Croatian Parliament and the Government of the Republic of Croatia the Financial Report for the year 2023. This report is an integral part of the HAKOM 2023 Annual Activity Report.

HAKOM is an independent and autonomous legal entity with public authority within the scope and competences prescribed by the ECA, the Postal Services Act (Official Gazette 144/2012, 153/2013, 78/2015 and 110/2019; hereinafter: PSA) and the Railways Act (Official Gazette 32/2019, 20/2021 and 114/2022; hereinafter: RA).

The founder of HAKOM is the Republic of Croatia, and the founding rights are exercised by the Croatian Parliament and the Government of the Republic of Croatia. HAKOM is responsible for its work to the Croatian Parliament.

In accordance with the ECA, HAKOM is governed by a five-member Council, appointed and dismissed by the Croatian Parliament on the proposal of the Government of the Republic of Croatia. Members of the Council are appointed for a period of five years with the possibility of reappointment. On 21 April 2023, the Croatian Parliament adopted the Decision on the appointment of the President and members of the Council of HAKOM (Official Gazette 46/2023).

HAKOM's expert, administrative and technical affairs are performed by the Administrative Service headed by the Executive Director of HAKOM.

HAKOM is a budget user of the state budget, representing the third organisational level and belongs to only one division. HAKOM is within the scope of work of the Ministry of the Sea, Transport and Infrastructure, as the line ministry, that is, the central body of state administration. In accordance with the Act on Execution of the State Budget of the Republic of Croatia for 2023 (Official Gazette 145/2022, 63/2023 and 129/2023), HAKOM plans the assigned revenues and receipts in the state budget, while the obligation to pay these revenues into the state budget does not apply to HAKOM. The generation and expenditure of the assigned revenues and receipts are reported on a monthly basis in the State Treasury system.

HAKOM's Financial Plan for 2023 was adopted in accordance with budget regulations as part of the budget of the Ministry of the Sea, Transport and Infrastructure.

Register of budget users: 45902

Level: 11 – State budget user and division within the line ministry

Chapter: 06565

Activity: 8413 Regulation of and contribution to more efficient operation of businesses

In 2023, HAKOM generated assigned revenues, EU aid, revenues from the sale of non-financial assets and other revenues in the total amount of EUR 13,886,642, which were not fully sufficient to cover all expenditures of HAKOM in the amount of EUR 13,980,057. The total deficit in revenues in 2023 was recorded in the amount of EUR 93,415, so that the surplus of revenues carried forward from the previous years was partially used. The remaining surplus of revenues carried forward is planned to be used in the coming period for the financing of part of the expenditures for additional investments in non-financial assets.

REVENUES

Table 1. Revenue overview (in EUR)

Account from Acc. Plan	HAKOM revenues	Realised in 2023
63	Aid from abroad and from entities within the general budget	42,715
632	Aid from international organisations and EU institutions and bodies	42,715
64	Revenues from assets	5,306
641	Revenues from financial assets	5,306
65	Revenues from oper. and admin. fees, fees pursuant to special legislation and fees	13,785,179
652	Revenues under special regulations	13,785,179
68	Penalties, administrative measures and other revenues	13,764
683	Other revenues	13,764
6	Operating revenues	13,846,964
72	Revenues from the sale of produced long-term assets	39,678
722	Revenues from the sale of plant and equipment	528
723	Revenues from the sale of transport equipment	39,150
7	Revenues from the sale of non-financial assets	39,678
	HAKOM TOTAL REVENUES	13,886,642

HAKOM's revenues are ensured on the basis of HAKOM's annual financial plan, in compliance with the ECA, the PSA and the RA, from the following sources:

1. from the fee for the radiofrequency spectrum management;
2. from the fee for the addressing and numbering space;
3. from the fee for the performance of other activities of HAKOM in the percentage of the total annual gross revenues generated by operators in the previous calendar year in the activities of electronic communications networks and services on the market, except broadcasters broadcasting their radio or television programmes through their own electronic communications networks, which they use solely for this purpose;
4. from postal services fees, as a percentage of total annual gross revenues generated by postal service providers in the previous calendar year;
5. from the fee for performing activities in the field of rail market regulation, as a percentage of the total annual gross revenues generated by infrastructure managers in the previous calendar year.

In addition to the assigned revenues, HAKOM may also generate revenues from other sources in accordance with special laws, and these revenues may be used in accordance with the act governing the planning, preparation, adoption and execution of the budget.

The calculation and amount of fees and the manner of payment of fees for the financing of HAKOM's activities are laid down in the Ordinance on the payment of fees for the performance of HAKOM's activities, adopted by the Council of HAKOM.

The fees are established pursuant to the principles of objectivity, transparency, proportionality and non-discrimination. Before adopting the Ordinance, a public consultation procedure is carried out.

Revenues pursuant to special legislation constitute the most significant revenues for the performance and development of HAKOM's activities. Revenues pursuant to special legislation in 2023 amounted to EUR 13,785,179, up by 61% from the performance in 2022. The increase in revenues was mostly the result of the increase in certain fees based on the Ordinance on the payment of fees for business operations of HAKOM (Official Gazette 154/2022), applied as of 1 January 2023.

The following rates were increased:

- the fee for the performance of other activities of HAKOM in the field of electronic communications, from 0.20% to 0.45% of the total annual gross revenues generated by operators in the previous calendar year in the activities of electronic communications networks and services on the market;
- the fee for performing HAKOM's activities in the field of rail market regulation, from 1.80% to 2.65% of the total annual gross revenues generated by infrastructure managers in the previous calendar year from performing rail services.

The above-mentioned fees were raised because HAKOM significantly reduced the fees for the

radiofrequency spectrum management in the previous year to use the generated surplus revenues from the previous period. Consequently, the above-mentioned fees were increased, while the fees for radiofrequency spectrum management remained reduced.

The most significant part of revenues under special legislation include revenues from the fees for the performance of other activities of HAKOM in the percentage of the total annual gross revenues of the operators in the previous calendar year in the activities of electronic communications networks and services on the market, except broadcasters broadcasting their radio or television programmes through their own electronic communications networks, which they use solely for this purpose and the fees for the radiofrequency spectrum management.

Table 2. Revenues from operating and administrative fees, fees pursuant to special legislation and fees (in EUR)

	Revenues from operating and admin. fees, fees pursuant to special legislation and fees	Realised in 2023
1.	Revenues from the fees for the radiofrequency spectrum management	5,546,264
2.	Revenues from the fees for the addressing and numbering space management	896,385
3.	Revenues from the fees for the performance of other activities of HAKOM in the percentage of the total annual gross revenues of the operators in the previous calendar year in the activities of electronic communications networks and services on the market, except broadcasters broadcasting their radio or television programmes through their own electronic communications networks, which they use solely for this purpose	6,062,073
4.	Revenues from the fees for the performance of HAKOM's activities in the field of postal services as a percentage of total annual gross revenues generated by postal service providers in the previous calendar year	744,005
5.	Revenues from the fees for performing HAKOM's activities in the field of rail market regulation, as a percentage of the total annual gross revenues generated by infrastructure managers in the previous year	469,507
6.	Other revenues from operating and administrative fees	66,945
	TOTAL	13,785,179

Aid from abroad and from entities within the general budget consists of current aid from EU institutions and bodies in the form of refunds for official travel expenses, which amounted to EUR 42,715 in 2023. Of the total amount of EU aid, EUR 33,647 related to refunds for official travel expenses from BEREC and EUR 9,068 from other EU bodies. The increase in revenues from current aid from EU institutions and bodies, relative to the previous year, is the result of increased foreign official travel for the purpose of participation in the meetings of EU institutions and bodies in

2023, compared with 2022 when it was restricted in the first half of the year due to the COVID-19 crisis. In addition, in October 2022, President of the Council of HAKOM Mr Obuljen was elected BEREC Chair for 2024, as a result of which HAKOM took over the role of the Incoming Chair. As a result, HAKOM's experts were required to make a significant contribution by participations in a large number of BEREC meetings, thus increasing the number of foreign official travels for which refunds of costs were realised.

Revenues from financial assets relate to interest income on demand deposits, income from default interest and foreign exchange gains totalling EUR 5,306. Guarantee deposits agreed in euro and given to the lessor Officium partner d.o.o. as guarantee for the regular payment of the lease and common costs are expressed as the midpoint rate of the Croatian National Bank as at 31 December 2022, where unrealised foreign exchange differences are shown (D 122111/P 964151). In 2023, due to the changeover to the new currency, the euro, revenues from foreign exchange gains in the amount of EUR 551 were recognised for the above-mentioned.

Other revenues, in the amount of EUR 13,764, were largely accounted for by the reimbursement of funds for the financing of studies from employees who had not met their obligations under the tuition contract.

Revenues from the sale of produced long-term assets were recorded in 2023 in the amount of EUR 39,678 and were largely generated from the sale of a twelve-year old official vehicle. The sale of the official vehicle was conducted based on the public tender by collecting sealed written offers, and the criterion for the selection of the offer was the highest offered selling price. The vehicle was sold at the price of EUR 39,150.

EXPENDITURES

HAKOM's expenditure in 2023 amounted to EUR 13,980,057.

Table 3 shows HAKOM's expenditure by area. HAKOM's expenditure consists of the expenditure for the electronic communications sector, expenditure for the postal services sector and expenditure for the regulation of rail services market.

HAKOM in its accounts registers operating expenditure (class 3) and expenditure for the acquisition of non-financial assets (class 4).

In 2023, financial resources were spent on the following:

1. operating expenditure (class 3)

a) *employee expenditure (group 31)* in the amount of EUR 7,356,346, which relate to the payment of salaries and other employee expenses. The increase in employee expenditure of 8.8% from the previous year is the result of the increase in the total amount of the length-of-service allowance cost and the adjustment of salaries to inflation.

b) *material expenditure (group 32)* in the amount of EUR 4,867,313

I. Compensation of expenses to employees (sub-group 321) were mostly accounted for by official travel expenses, employee transport costs and professional development of employees. Official travel expenses increased significantly from the previous year as a consequence of the larger number of foreign official trips after they were restricted in the first half of 2022 due to the COVID-19 crisis. In 2023, HAKOM employees also participated in a large number of foreign meetings and conferences (meetings of BEREC, EU Council, ERGP, RSC, PDC and other EU bodies, participation in the World Radiocommunication Conference WRC-23, etc.).

The professional development of employees in 2023 stood at EUR 114,937. It mostly referred to the training of the employees of the RF Spectrum Control Department for the work on the Rohde & Schwarz ARGUS system, foreign language courses, participation in conferences, the development of competences for project coordinators and managers, education on information security and expert seminars and consultations.

II. Expenditures for materials and energy (sub-group 322) refer to electricity and thermal energy, fuel, office material and other material expenses, car tyres, etc.

III. Expenditure for services (sub-group 323) mostly consists of rents and leases, intellectual and personal services, computer services, regular and investment maintenance services and other services.

In 2023, relative to 2022, rents and leases were reduced because in the second half of 2022 a new lease agreement for the business premises in Zagreb was concluded at more favourable prices than under the previous agreement.

In 2023, intellectual and personal services included the audit of the regulatory accounting system of Hrvatski Telekom d.d., the audit of the regulatory report of the universal service provider, the service of the price cap calculation for the 2023 – 2025 period, consultation services for the preparation, implementation and evaluation of the electronic auction procedure for the RF spectrum allocation for 5G mobile communication networks, the service of the development of the cost model for ERT, the services of checking the accuracy of the calculation of universal service provider's net cost, consultation services and the provision of regulatory information, a survey of the satisfaction and needs of postal services users (business users), consultation services in updating the Cost Model to determine new wholesale fees, etc.

Computer services refer to software maintenance – CABP, GIS, CHIRplus, HRNet, Navision, network applications, e-Licences, e-Operator, Do Not Call Register application, Centrix, HAKOMetar Plus, market analysis system (SAT), etc.

Regular and investment maintenance services consist of the maintenance of control and measuring centres and stations, the leased business premises in Zagreb, equipment and official vehicles.

In 2023, other services referred to the cleaning service and the costs of common consumption in the leased business premises in Zagreb, the service of microwave links decommissioning and installation, the services of archiving, media coverage of releases, the 2023 Accessibility Project, etc.

IV. Other unmentioned operating expenditure (sub-group 329) mostly refer to premiums for the insurance of vehicles, other property and employees, representation expenses (15th and 16th round table of rail services stakeholders, 5G Day, Round table with consumer protection associations, Electronic Communications Market Day, meeting of BEREC Miniboard members, etc.).

c) *financial expenditure (group 34)* in the amount of EUR 6,572 mostly refers to banking services, payment operations services and negative exchange rate differences.

2. expenditure on the acquisition of non-financial assets (class 4)

a) *expenditure on the acquisition of produced long-term assets (group 42)* in the amount of EUR 1,384,214, which refer to the business facility (construction of Bilogora CMS and power facilities for the purpose of connecting Bilogora CMS to the electricity distribution grid), expenditure for the acquisition of computers and computer equipment (computer network equipment, computer servers, a photocopier, scanners, etc.), communication equipment, measurement instruments and devices for Bilogora CMS and antennas for a measuring vehicle, two official vehicles were purchased and investments in the Business Central accounting programme and in the identity management and user access system were recorded;

b) *expenses for additional investments on non-financial assets (group 45)* in the amount of EUR 365,612 include additional investments on other non-financial assets (upgrading of Navision, e-Licences, e-Operator, GIS system, HRNet, Cisco ISE Plus system, CABP application, time recording application, etc.), additional investments on vehicles (upgrading of a measuring vehicle), additional investments in buildings (installation of solar panels on Rijeka CMS) and additional investments in equipment (upgrading of the disk system and the disaster recovery system).

Table 3. Expenditure overview (in EUR)

Account from Acc. Plan	HAKOM expenditure	HAKOM	Electronic communications area	Postal services area	Railway market regulation services area
	Expenditure total	13,980,057	12,857,250	688,601	434,206
3	Operating expenditure	12,230,231	11,109,660	687,260	433,311
31	Employee expenses	7,356,346	6,714,468	389,453	252,425
311	Salaries (gross)	5,499,730	5,031,046	285,358	183,326
312	Other employee expenses	948,425	853,167	56,748	38,510
313	Contributions on salaries	908,191	830,255	47,347	30,589
32	Material expenditure	4,867,313	4,389,258	297,455	180,600
321	Compensations of expenses to employees	614,008	553,661	38,896	21,451
322	Expenditures for materials and energy	457,582	407,104	29,349	21,129
323	Expenditure for services	3,614,279	3,264,594	223,255	126,430
329	Other unmentioned operating expenditure	181,444	163,899	5,955	11,590
34	Financial expenditure	6572	5934	352	286
343	Other financial expenditure	6572	5934	352	286
4	Expenditure on the acquisition of non-financial assets	1,749,826	1,747,590	1,341	895
42	Expenditure on the acquisition of produced long-term assets	1,384,214	1,381,978	1,341	895
421	Buildings	204,864	204,864	0	0
422	Plant and equipment	879,356	877,120	1,341	895
423	Transport vehicles	63,393	63,393	0	0
426	Intangible produced assets	236,601	236,601	0	0
45	Expenses for additional investments on non-financial assets	365,612	365,612	0	0
451	Additional investments in buildings	16,437	16,437	0	0
452	Additional investments in plant and equipment	7633	7633	0	0
453	Additional investments in transport vehicles	74,614	74,614	0	0
454	Additional investments in other non-financial assets	266,928	266,928	0	0

The most represented expenditure in HAKOM's total expenditure is employee expenditure, amounting to EUR 7,356,346, while material expenditures are the second most represented group of expenditure, amounting to EUR 4,867,313 in 2023. The most significant material expenditure is related to the expenditure for services, of which the expenditure for rents and leases is the most represented expenditure, followed by the expenditure for intellectual and personal services, computer services, regular and investment maintenance services, other services, etc.

Table 4. Representation of individual types of expenditure in total expenditure (in %)

Account from Acc. Plan	HAKOM expenditure	HAKOM	Electronic communications area	Postal services area	Railway market regulation services area
31	Employee expenses	52.6	52.2	56.5	58.1
32	Material expenditure	34.8	34.1	43.2	41.6
34	Financial expenditure	0.1	0.1	0.1	0.1
42	Expenditure on the acquisition of produced long-term assets	9.9	10.8	0.2	0.2
45	Expenses for additional investments on non-financial assets	2.6	2.8	0.0	0.0
	TOTAL	100	100	100	100

SURPLUS REVENUE

On 1 January 2023, HAKOM had surplus operating revenue of EUR 3,353,768 and deficit in revenues from non-financial assets of EUR 1,384,257 recorded in the basic accounts of sub-group 922 in the Balance Sheet. In March 2023, the Decision on the distribution of results was adopted, by which the deficit in revenues from non-financial assets was fully covered by surplus operating revenues. The remaining surplus operating revenue stood at EUR 1,969,511.

In 2023, an operating revenue surplus was recorded, amounting to EUR 1,616,733 and deficit in revenues from non-financial assets amounted to EUR 1,710,148. In order for the result at the end of the budget year to reflect a more realistic balance of results by activities, results were adjusted for the situations prescribed by the Ordinance on budget accounting and the accounting plan.

After the conducted adjustment in 2023, an operating revenue surplus was recorded, amounting to EUR 1,656,411 and deficit in revenues from non-financial assets amounted to EUR 1,749,826. At the end of 2023, total surplus operating revenue amounted to EUR 3,625,922 and deficit in revenues from non-financial assets amounted to EUR 1,749,826.

In March 2024, the Decision on the distribution of results was adopted, by which the deficit in revenues from non-financial assets in the amount of EUR 1,749,826 was fully covered by surplus operating revenues. Following the implementation of the Decision on the distribution of results, in the basic accounts of the Balance Sheet sub-group 922, surplus operating revenue totalled EUR 1,876,096, available in the coming period.

BUDGET EXECUTION

Budget execution is defined in the Act on Execution of the State Budget of the Republic of Croatia. HAKOM's financial resources were spent in accordance with the planned activities. The generation and expenditure of assigned revenues and receipts are reported on a monthly basis in the State Treasury system.

Table 5. Budget execution (in EUR and %)

	Execution 2022 (EUR)	Plan 2023 (EUR)	Execution 2023 (EUR)	Index execution 2023/plan 2023	Index execution 2023/2022
3107 Development of the postal services and electronic communications markets	12,563,603	15,893,724	13,762,107	87	110

Table 6. Budget execution – analytics (in EUR and %)

	ITEM	Plan	Realised	%
3 + 4	EXPENDITURE TOTAL	15,893,724	13,762,107	87
3	Operating expenditure	13,566,558	12,024,636	89
31	Employee expenses	7,835,741	7,292,685	93
32	Material expenditure	5,705,822	4,725,695	83
34	Financial expenditure	16,341	6,256	38
38	Other expenditure	8654	0	0
4	Expenditure on the acquisition of non-financial assets	2,327,166	1,737,471	75
41	Expenditure on the acquisition of non-produced long-term assets	109,762	0	0
42	Expenditure on the acquisition of produced long-term assets	1,683,265	1,371,207	81
45	Expenses for additional investments on non-financial assets	534,139	366,264	69
6 + 7	TOTAL INCOME	13,735,085	13,886,091	101
6	Operating revenues	13,733,758	13,846,413	101
63	Aid from abroad and from entities within the general budget	39,817	42,715	107
64	Revenues from assets	14,732	4755	32
65	Revenues from administrative and operating fees	13,664,610	13,785,179	101
68	Penalties, administrative measures and other revenues	14,599	13,764	94
7	Revenues from the sale of non-financial assets	1327	39,678	2990
72	Revenues from the sale of produced long-term assets	1327	39,678	2990

In the preparation of financial plans and monitoring budget execution, modified accrual basis is not applied, but revenues and expenditures are reported exclusively on a cash basis. For this reason, the data in Table 6 Budget execution – analytics differ from the data in Table 1 Revenue overview and Table 3 Expenditure overview. There is a difference in revenue of EUR 551 representing unrealised exchange rate differences for the guarantee deposit on 31 December 2022, which, due to the changeover to the euro in 2023 were recognised as revenues from foreign exchange gains. The above is not shown in the monthly record order within the state treasury system.

The Budget Act gives flexibility in the execution of assigned revenues and receipts so that it prescribes the possibility of their execution in amounts higher than planned, and the limit is set at the level of revenue generation, that is, up to the amount paid.

In order to ensure liquidity for HAKOM's proper operations, it is necessary to generate a certain surplus of revenues at the end of each business year carried forward for the purpose of financing current expenditures in the first four months of the following year as they are higher than current revenues in the relevant period.

ANNUAL FINANCIAL STATEMENTS OF HAKOM FOR 2023

Entities subject to budget accounting and preparing financial statements within the budget system prepare and submit their financial statements for 2023 in accordance with the provisions of the Ordinance on financial reporting in budget accounting (Official Gazette 37/2022).

The Annual Financial Statements of HAKOM for 2023 were submitted on 30 January 2024 through the web application of the Ministry of Finance (Financial reporting within the budget system and the Register of budgetary and extra-budgetary users – RKPFI) and the line ministry.

Copies of the signed HAKOM's Annual Financial Statements for 2023 are published on [HAKOM's website](#):

1. Budget statements, budget and extra-budgetary user statements for the period: 1 January 2023 – 31 December 2023 – Reference page
2. Statement of revenue and expenditure, receipts and expenses for the period: 1 January 2023 – 31 December 2023 – Form: PR-RAS
3. Balance Sheet as of 31 December 2023 – Form: BALANCE SHEET
4. Statement of expenditure by functional classification for the period: 1 January 2023 – 31 December 2023 – Form: RAS-functional
5. Statement of changes in the value and volume of assets and liabilities for the period: 1 January 2023 – 31 December 2023 – Form: P-VRIO
6. Statement of liabilities for the period: 1 January 2023 – 31 December 2023 – Form: LIABILITIES
7. Notes to the financial statements of HAKOM for the period 1 January 2023 – 31 December 2023

Abbreviations

A1 – A1 Hrvatska

ADSL – Asymmetric Digital Subscriber Line

AEM – Agency for Electronic Media

ARRSM – Act on the Regulation of Rail Services Market

BCO – Broadband Competence Office

BEREC – Body of European Regulators for Electronic Communications

CADPN – Central Administrative Database of Ported Numbers

CAFP – Competent Authority for the Framework Programme (for the development of broadband internet access)

CEPT – European Conference of Postal and Telecommunications Administrations)

CERP – European Committee for Postal Regulation

CPG – Conference Preparatory Group (WRC preparatory group)

DAB+ – Digital Audio Broadcasting

DVB-T – Digital Video Broadcasting –Terrestrial2

EC – European Commission

ECA – Electronic Communications Act

ECC – Electronic Communications Committee

ECI – Electronic Communications Infrastructure

EECC – European Electronic Communications Code

EMF – electromagnetic field

ENISA – European Network and Information Security Agency

ENRRB – European Network of Rail Regulatory Bodies

ERGP – European Regulators Group for Postal Services

EU – European Union

FER – Faculty of Electrical Engineering and Computing, University of Zagreb

FM – Frequency Modulation

FNP – Framework National Programme (for the development of broadband internet access)

FTTB – Fiber To The Building

FTTDP – Fiber To The Distribution Point

FTTH – Fiber To The Home

HAKOM – Croatian Regulatory Authority for Network Industries

HCM Agreement (Harmonized Calculation Method) – an international agreement for the harmonisation of frequencies for mobile and fixed terrestrial systems

HP – Hrvatska pošta d.d.

HR – Republic of Croatia

HRT – Hrvatska radiotelevizija

HT – Hrvatski Telekom d.d.

HŽI – HŽ infrastruktura

HŽPP – HŽ putnički prijevoz

IoM – (Railway) Network Report

IoT – Internet of Things

IPTV – Internet Protocol Television

IRG-Rail – Independent Regulators Group – Rail

ISP – Internet Service Provider

ITU – International Telecommunication Union

LSU – local self-government unit

M2M – Machine to Machine

MMS – Multimedia Message Service

MPP – minimum access package in the rail services market

MSTI – Ministry of the Sea, Transport and Infrastructure

MVNO – Mobile Virtual Network Operator

NATO – North Atlantic Treaty Organization

OECD – Organisation for Economic Co-operation and Development

OTT – Over-the-top service

PAY TV – Television programmes with payment

BIDP – Broadband Infrastructure Development Plan

PSA – Postal Services Act

PSAP – Public Safety Answering Point

PWD – Persons with disabilities

RA – Railway Act

RF – Radiofrequency

RFI – Regulatory Financial Statement

RIA – Regulatory Impact Assessment

RSC – Radio Spectrum Committee

RSPG – Radio Spectrum Policy Group

CSODDS – Central State Office for the Development of the Digital Society

SGA – State Geodetic Administration

SMS – Short Message Service

T-DAB – Terrestrial Digital Audio Broadcasting

Telemach – Telemach Hrvatska

TV – Television

UPU – Universal Postal Union

VDSL – Very-high-bit-rate Digital Subscriber Line

VHCN – Very High Capacity Network

WIFI – Local wireless network within the 2.5/5 GHz frequency band

WLAN – Wireless Local Area Network

CRA – County roads administration

Figures and tables:

ELECTRONIC COMMUNICATIONS

Figure 2.1 Basic electronic telecommunications market data

Figure 2.2 Number of registered operators per type of activity

Figure 2.3 Total revenues of the electronic communications market (in EUR million)

Figure 2.4 Operator revenue shares in the fixed network market and fixed network revenue shares in total revenues

Figure 2.5 Operator revenue shares in the mobile network market and mobile network revenue shares

Figure 2.6 Total investments by electronic communications operators in the HR (in EUR million)

Figure 2.7 VHCN investments (in million EUR)

Figure 2.8 Total revenues of the broadband internet access market (in EUR million)

Figure 2.9 Number of service packages

Figure 2.10 VHCN coverage (% of households)

Figure 2.11 5G coverage (% of households)

Figure 2.12 Connections by the technology of access networks

Figure 2.13 Number of VHCN connections

Figure 2.14 Number of fixed connections by contracted access speed

Figure 2.15 Data traffic

Figure 2.16 Total revenues from telephone services in the mobile network (in EUR million)

Figure 2.17 Distribution of users by the type of subscriber relationship

Figure 2.18 Revenues from and the duration of roaming calls made by foreign users in national networks

Figure 2.19 Pay-TV connections by technology

Figure 2.20 Revenues from the Pay-TV service by technology (in EUR million)

Figure 2.21 Total revenues from and the number of users of the telephone service in the fixed network (in EUR million)

Figure 2.22 Number of M2M connections

Figure 2.23 Number of ported numbers in the fixed and mobile networks

Figure 2.24 Results of the survey of user habits and experiences

Figure 2.25 Internet access speeds measured by HAKOMetar Plus

Figure 2.26 HAKOMetar Plus and HAKOMetar measurement statistics

Figure 2.27 Number of users of optical fibre distribution networks – notices of intent to build

Figure 2.28 Number of defined special building conditions and issued main project certificates

Table 2.1 Address and/or number allocation – number of decisions

Table 2.2 Number allocation requests

Table 2.3 Numbers and the remaining capacity available for primary assignment

Table 2.4. Number of LSU and CRA requests for the regulation of property-law relations by year

Table 2.5 Projects within the FNP for which HAKOM issued opinions on conditions and fees

POSTAL SERVICES

Figure 3.1 Basic data on postal services market

Figure 3.2 Total revenues from postal services (in EUR million)

Figure 3.3 Providers' shares in total revenues

Figure 3.4 Total number of postal services (in million)

Figure 3.5 Shares of postal services by types of traffic

Figure 3.6 Provider market shares by number of provided services

Figure 3.7 Shares of types of postal services

Figure 3.8 Number of postal services by type (in million)

Figure 3.9 Share of postal services by type

Figure 3.10 total number of services within the scope of the universal service

Figure 3.11 Shares of services provided within the scope of the universal service by type

Figure 3.12 Total number of other postal services (in million)

Figure 3.13 Shares of services realised within the scope of other postal services by type

Figure 3.14 Measuring the quality of universal service in domestic traffic

RAILWAY SERVICES

Figure 4.1 Basic information on the railway infrastructure and operation of railway undertakings at the end of 2023

Figure 4.2 HR rail services market in 2023

Figure 4.3 Service facilities operators

Figure 4.4 Market shares by goods transported in railway freight transport

Figure 4.5 Shares in tonne-kilometres in railway freight transport

Figure 4.6 Number of transported passengers (in thousands)

Figure 4.7 Total realised tkm

Figure 4.8 Shares of infrastructure use by freight undertakings in train-kilometres

Figure 4.9 Charges for MAP in EU Member States in 2022 (EUR/tkm)

Figure 4.10 HŽI revenues from railway services (in EUR)

Figure 4.11 Shares in revenues by type of HŽI rail services

RF SPECTRUM MANAGEMENT

Figure 5.1 Basic data on radio stations

Figure 5.2 Number of base stations

Figure 5.3 Transfer capacity of microwave links over the years

Figure 5.4 Control and measuring station Bilogora

Figure 5.5 New antenna pole at the control and measuring centre Split

Figure 5.6 New measuring vehicle

Figure 5.7 New solar energy station at the control and measuring centre Rijeka

Figure 5.8 Interferences reported to the Italian Republic in line with the ITU procedure

Table 5.1 RF spectrum management – documents issued

CONSUMER PROTECTION

Figure 6.1 Number of disputes in electronic communications from 2020 to 2024

Figure 6.2 Number of disputes by operator in 2022 and 2023

Figure 6.3 Average number of disputes per every 10,000 users of each operator

Figure 6.4 Number of disputes by operator in 2023 from 2022

Figure 6.5 Ratio of disputes by type in 2022 and 2023

Figure 6.6 Ratio of positive to negative decisions for the user in 2022 and 2023

Figure 6.7 Ratio of decisions by reasons for disputes in 2023

Figure 6.8 Number of disputes by operator in the first instance in 2023 relative to 2022

Figure 6.9 Number of disputes by operator in the second instance in 2023 relative to 2022

Figure 6.10 Number of user disputes in the postal services market

Figure 6.12 Passenger complaints

Figure 6.13 New brochure for rail passengers

HAKOM'S OTHER ACTIVITIES

Figure 7.1 Implementation of FNP projects at the end of 2023

Figure 7.2 Comparison of contracted and realised indicators at the end of 2023

Figure 7.3 Statistics on administrative complaints

Figure 7.4 Number of administrative complaints by type of decision

Figure 7.5 Statistics on judgements in administrative disputes

Figure 7.6 Duration of court proceedings in electronic communications

Figure 7.7 Structure of employees according to fields

Table 7.1 Projects agreed within the first call based on the FNP

FINANCIAL STATEMENT

Table 1 Revenue overview (in EUR)

Table 2 Revenues from operating and administrative fees, fees pursuant to special legislation and fees (in EUR)

Table 3 Expenditure overview (in EUR)

Table 4 Representation of individual types of expenditure in total expenditure (in %)

Table 5 Budget execution (in EUR and %)

Table 6 Budget execution – analytics (in EUR and %)

