



ERICSSON



CENTRAL AND EASTERN EUROPE

ERICSSON MOBILITY REPORT

NOVEMBER 2016

MARKET OVERVIEW

Key figures: Central and Eastern Europe

	2016	2022	CAGR 2016–2022
Mobile subscriptions (million)	600	685	2%
Smartphone subscriptions (million)	240	410	10%
Data traffic per active smartphone (GB/month)	1.9	15	40%
Total mobile traffic (EB/month)	0.6	6	50%

The Central and Eastern Europe (CEE) telecommunications market is advancing well, driven by growing smartphone and app usage

The telecom sector focus is shifting from base services such as voice and SMS to instant messaging, internet calling (VoIP), video or music streaming and mobile payments.

Most countries in the region have a high demand and interest in new technologies, as well as online mobile services. For example, around 75 percent of internet users aged 15–69 in Russia and Poland use online services on a daily basis, and every 1 in 3 people uses more than 7 online services per day.¹

Digitalization of everyday activities is increasingly mainstream among internet users, and messaging has moved faster than other services. Viber, Facebook Messenger and WhatsApp are in the top five apps in terms of mobile traffic in the analyzed countries in the chart below.

Video is the second most popular of digitized services. Around 90 percent of internet users in Poland and Russia watch video through the internet, while around 40 percent watch videos and TV through the web rather than via traditional broadcasts.¹ YouTube is in the top two apps in terms of mobile data traffic in all of the analyzed countries shown below.



Growing smartphone ownership is driving higher usage of mobile data across the region. Smartphones are expected to account for around 40 percent of mobile subscriptions by the end of 2016 in CEE.

Top five applications per country by mobile traffic

Bulgaria	Croatia	Slovakia	Hungary	Poland	Romania	Ukraine
Viber	YouTube	YouTube	Gmail	YouTube	YouTube	Viber
YouTube	Viber	Gmail	YouTube	Google Maps	WhatsApp	YouTube
FB* Messenger	Gmail	Google Maps	Google Maps	Gmail	Facebook	Google Maps
Google Maps	WhatsApp	Google Play	FB Messenger	Google Play	Google Maps	Gmail
Facebook	Google Maps	FB Messenger	Viber	FB Messenger	FB Messenger	Google Play

Source: Ericsson analysis of App Annie data for Android smartphone apps (May 2016) in each country, excluding web browsers

*FB is an abbreviation of Facebook

¹ Ericsson ConsumerLab, Analytical Platform (2015)



On average, in CEE, users play games around 2 times a day, access social networks around 7 times a day and check the news 10 times a day



Mobile taking center stage

In most countries, consumers make use of mobile connectivity to fulfill their expectations for “right here, right now” internet access. For example, more than 60 percent of internet users between 15–69 years old in Russia and Poland access the web through mobile broadband.² This trend is now migrating to applications, with around half of internet users increasing their usage of apps for messaging, internet calling, education, news access and video services since last year. One third of smartphone users in Russia and Poland record and share videos over apps, such as Snapchat, Facebook Messenger and Instagram. On average, in CEE, users play games around 2 times a day, access social networks around 7 times a day and check the news around 10 times a day.³

 Smartphone subscriptions are expected to reach 410 million by 2022

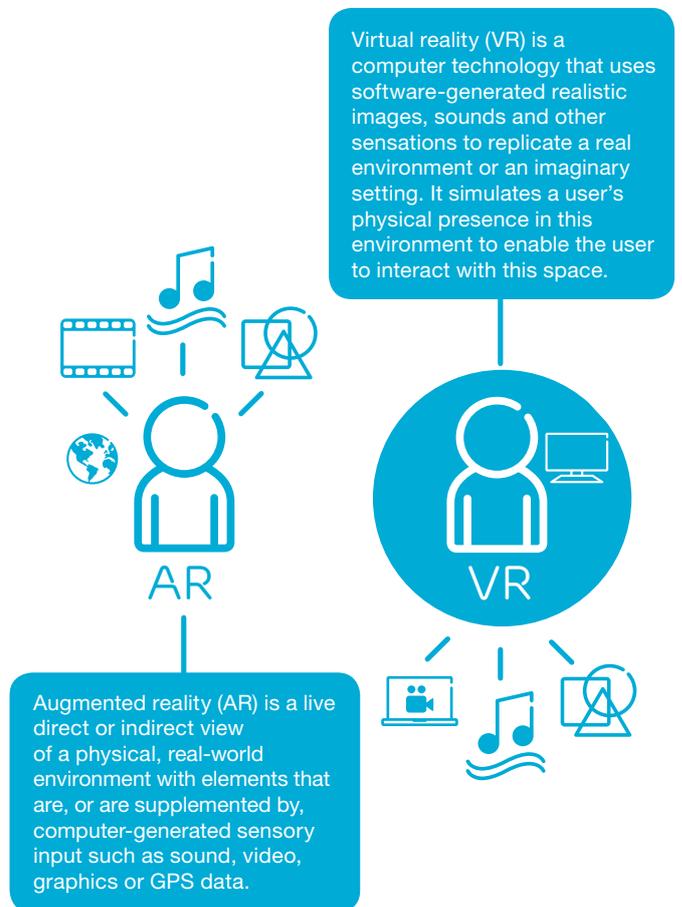
Games on mobile devices increasingly popular

Mobile games on smartphones and tablets are becoming more popular than online PC games. While about 40 percent of the population play games on a PC or games console, 2 out of 3 users do so on mobile phones, smartphones or tablets.²

Gaming on Android phones has increased by 20 percent over the last 2 years, while average traffic per user per month generated by gaming apps has increased fivefold.⁴ This increase is further fueled by the usage of augmented reality (AR) and virtual reality (VR) in games. AR/VR allow mobile games on-the-go to provide a truly immersive experience for customers. Consequently, however, the demands on network coverage and data rates are high.

61 percent of Muscovites think games that offer a 360-degree view on a smartphone will be mainstream within 3 years.⁵

Growing interest in apps and mobile games, together with mobile broadband development, presents an exciting future for the region’s gaming and ICT industries.



² Ericsson ConsumerLab, Analytical Platform (2015)

³ Ericsson analysis of App Annie data for 10 top apps in each category by monthly active users across countries (May 2016)

⁴ Ericsson analysis of App Annie data for top 10 Android gaming apps by MAU across countries (May 2014–May 2016) excluding Wi-Fi

⁵ Ericsson ConsumerLab, 10 Hot Consumer Trends (2015)

MOBILE SUBSCRIPTIONS

WCDMA/HSPA networks are deployed in every CEE country and most countries have also deployed LTE networks. Some operators that want to be perceived as being technology leaders have also started early 5G testbeds. The mobile subscription base will continue to grow, and is expected to reach 685 million subscriptions in 2022. Of these, 70 percent will be LTE

Smartphone penetration growing fast

The number of smartphone subscriptions is forecast to reach around 240 million by the end of 2016, accounting for around 40 percent of total mobile subscriptions.

By the end of 2018, it's estimated that every second mobile phone in CEE will be a smartphone, while by the end of 2022, the uptake of smartphones is forecast to reach 410 million subscriptions; this means that more than 60 percent of mobile subscriptions will be for smartphones. The number of mobile PCs, tablets and mobile routers will also grow over the next 6 years, maintaining a 5 percent share of total mobile subscriptions.



4G subscriptions will surpass 3G by 2020

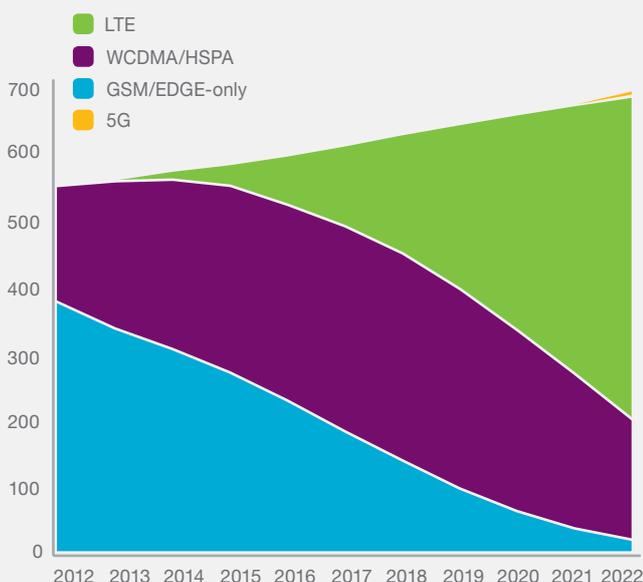
LTE subscriptions are spreading throughout Europe

The share of LTE subscriptions in CEE is expected to account for around 10 percent of all mobile subscriptions by the end of 2016. That is two times more than at the end of 2015. LTE growth is expected to be fast, with LTE subscriptions surpassing GSM/EDGE-only subscriptions by 2018 and overtaking WCDMA/HSPA subscriptions by 2020 – accounting for almost half of total subscriptions.

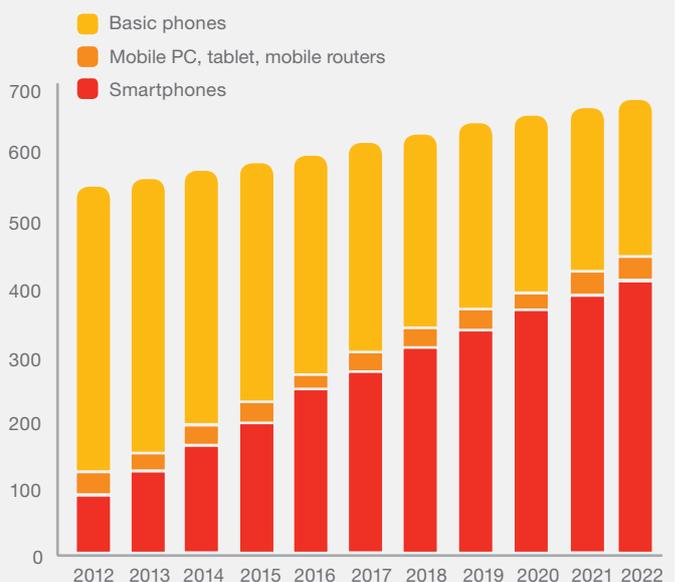
People's experience of high network performance positively impacts on their willingness to upgrade to LTE.⁶ With higher data throughputs and lower latency, LTE technologies improve data and mobile app experience and contribute to providing seamless video streaming services.

The number of LTE subscriptions is expected to rapidly grow to reach 480 million subscriptions by the end of 2022, equating to around 70 percent of all mobile subscriptions. The development of 5G is only expected to start by 2021, reaching around 5 million subscriptions in 2022.

Mobile subscriptions, Central and Eastern Europe (million)



Mobile subscriptions split per device, Central and Eastern Europe (million)



⁶ Ericsson ConsumerLab, Rethink Smartphone Usage (2016)

MOBILE TRAFFIC

Mobile data traffic is continuing to rise steadily, and by the end of 2016 it is expected to have grown by around 50 percent compared to 2015. It is expected to rise by a compound annual growth rate (CAGR) of around 45 percent between 2016 and 2022, reaching almost 6 ExaBytes (EB) per month. Mobile voice traffic is forecast to slightly increase in the coming years, but should have close to no impact on total mobile traffic volumes

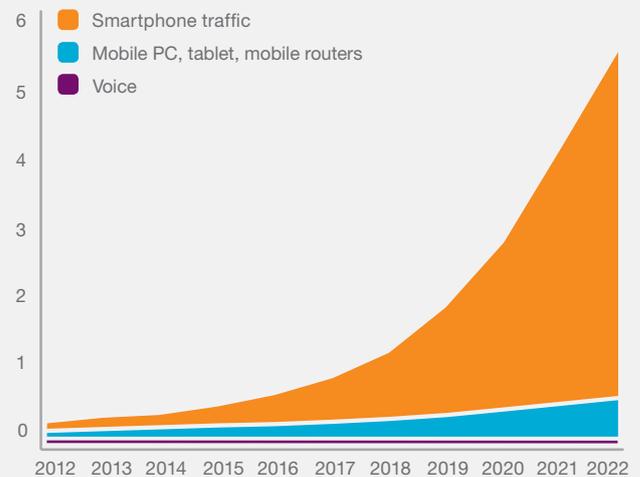
CEE increasingly utilizes mobile data

In 2016, the volume of data traffic generated by active smartphones is around three times more than the mobile data traffic generated by other devices such as PCs, tablets or routers. Operators offer a wide range of price plans to make usage of mobile data and services accessible. Bundles including a set of data traffic, voice minutes and SMS are the most popular offerings, whilst price plans where subscribers can share data through all owned devices, or with friends and relatives, are also proving popular.

Over the last two years data traffic in mobile networks has doubled. Monthly traffic generated per user by applications increased threefold.⁷ Adoption of video-capable applications drives mobile data usage. Consequently, heavy users of video applications have data plans with higher data buckets, and more than a third already have plans with at least 4 GB per month.⁸

The volume of data traffic generated by smartphones in CEE on mobile networks increases every year, and will continue to grow over the next 6 years with a CAGR of 40 percent. The amount of data used on each active smartphone subscription should increase substantially; from an average of 1.9 GB per month in 2016, to a forecast average of around 15 GB per month in 2022. Traditional voice traffic will form a negligible part of overall traffic development, as customers transition to online and mobile apps for personal communication.

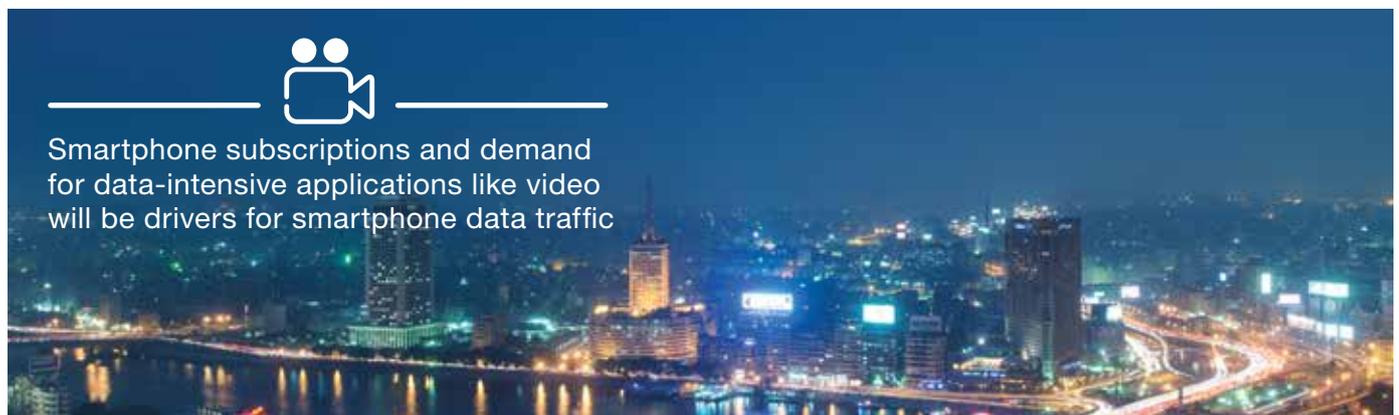
Mobile traffic, Central and Eastern Europe (EB/month)



X12 Smartphone data traffic will grow by 12 times in the next 6 years



Smartphone subscriptions and demand for data-intensive applications like video will be drivers for smartphone data traffic



⁷ Ericsson analysis of App Annie data for Android smartphone top 10 apps by MAU (May 2014–May 2016) excluding Wi-Fi

⁸ Ericsson ConsumerLab, Rethink Smartphone Usage (2016)

APP PERFORMANCE

The perceived network experience when using mobile apps is a key factor for customer satisfaction and loyalty towards mobile service providers

Video usage everywhere

Over the past two years, many new mobile video apps have been launched, and existing apps have been enriched with new video capable features. The ability to watch live broadcasts of user generated content on existing apps, like Facebook, has also increased the appeal of live streaming. In 2016, such applications are among the most popular in CEE.

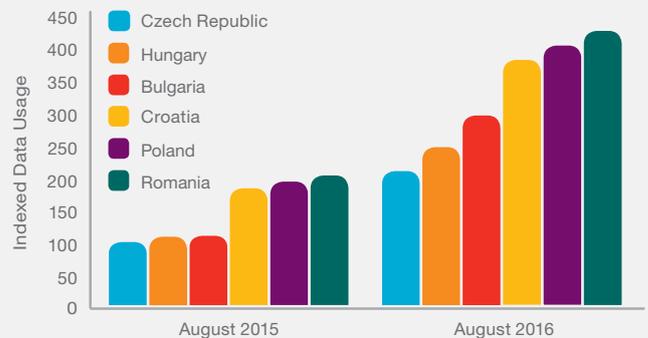
While Wi-Fi is the preferred connection for streaming services, video streaming on mobile networks has also increased, as consumers use both access technologies to perform this activity. For example, monthly traffic generated by YouTube customers almost doubled, both over Wi-Fi and mobile networks.⁹ The growing utilization of apps and video on mobile networks has made YouTube, and other mobile streaming apps, the top app in terms of mobile data consumption in several CEE countries.

Seamless usage for a smooth experience

Evolving smartphone usage expectations mean that users evaluate their experience in new ways. In fact, smartphone users have developed their own implicit mental index to measure mobile broadband performance from their operator, with customers in CEE using, on average, two to three mental indexes to judge network performance.

Mobile broadband performance in people's minds is represented by tangible app experiences. For the majority of people, time-to-content is the most important factor. Other mental indexes include uploading pictures on social networks or downloading email attachments.

Average YouTube monthly data traffic per user on Android phones (indexed data traffic)



Source: Ericsson analysis of App Annie data for Android smartphone apps in each country (August 2015–August 2016)

The time taken to load video content on mobile apps is another mental index adopted by a third of consumers, making optimal mobile video viewing a key category to secure user satisfaction.

Seamless connectivity that offers a smooth and immersive video and mobile games experience positively impacts on customer loyalty. At the same time, mobile broadband and app usage experience has twice the impact on customer loyalty compared to voice experience.¹⁰

User satisfaction, loyalty and advocacy can be addressed by continuous updates on the ICT infrastructure, leveraging on high performing and flexible networks, while relying on agile support systems to effectively manage customer experience.

Share of people who use the following mental indexes to rate performance in Central and Eastern Europe



51%
Time taken to open a web page on a browser



36%
How quickly pictures upload on social media sites



31%
Time taken for email attachments to download



27%
Time taken for video to load



22%
Time taken to transfer files on chat apps



22%
Time taken to download apps

Source: Ericsson ConsumerLab, Smartphone experience study (2016)

Base: All 3G/4G users, aged 18–69, using apps on mobile broadband at least weekly in Russia, Ukraine and Poland

⁹ Ericsson analysis of App Annie data for Android smartphone apps in each country (May 2016)

¹⁰ Ericsson ConsumerLab, Rethink Smartphones Usage (2016)

IOT DRIVING LIFESTYLE

The number of connected devices in CEE is rapidly increasing as the Internet of Things (IoT) becomes a reality. By the end of 2016, around 5.6 billion IoT connections are projected worldwide, of which, around 300 million will be in CEE – 35 percent more than at the end of 2015. Rapid growth of IoT is forecast in the region, with 1.3 billion IoT connected devices expected by 2022, which corresponds to a CAGR of around 27 percent between 2016 and 2022

The IoT market in CEE is in an early phase of development, with around 7 percent of all IoT devices connected to cellular networks.

Networked lifestyle

Digital transformation of many industries in CEE drives growth of new services and interaction channels. Connected devices are part of a networked lifestyle in which people wear, for example, devices to track their health.¹¹ Although current wearable penetration is low in the region, interest in health and wellness apps is high. In fact, while less than 3 percent of the population used wearable fitness bands in 2015¹², around half of Russians are interested in wearable blood pressure monitors or smart weight scales in the home.

Connected world

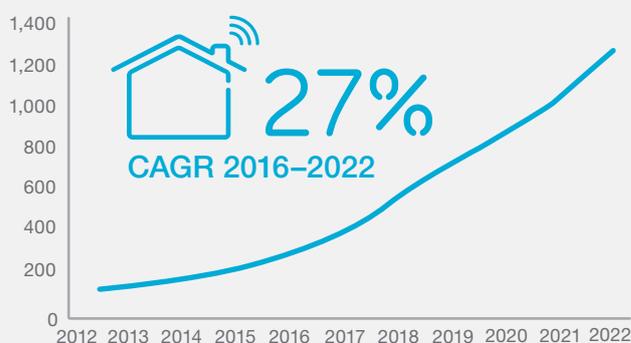
In CEE, people also show high interest in connecting home alarms, cameras, cars and home electricity meters. Connecting the TV to the internet for access to on-demand services is top of people's wish lists. For example, two out of three users in Romania perceive the internet as a natural part of TV/video consumption.¹³

Consumers believe connectivity offers additional advantages when using different types of devices, such as improved efficiency and enhanced functionality. Connected devices are also expected to increase personal productivity and enhance safety in cars.

As shown in the graph on the right, home electricity meters could also be drivers of IoT in CEE, as smart meters allow consumers to adapt electricity usage to their needs and save money using electricity at off-peak times. Poland, Russia, Hungary, Romania and the Czech Republic, among other countries, have already launched smart grid projects.

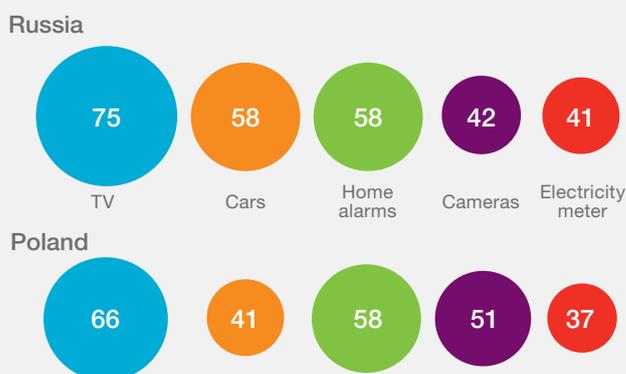
At the same time, the intelligent transport system segment has a high potential for IoT growth in CEE. Government programs like HeERO, and the pan-European in-vehicle emergency call service "eCall" have already been launched in Bulgaria, Croatia, Czech Republic and Romania. Other programs, like ERA-GLONASS in Russia, are expected to stimulate an evolving range of services that will need cellular IoT connectivity.

IoT connections in Central and Eastern Europe: cellular and non-cellular (million)



To increase the share of cellular IoT connections, service providers would benefit from support systems that provide better flexibility, rapid implementation of new applications and data collection. Cellular networks can be upgraded with new standards to meet the emerging range of new massive IoT use cases. These technologies¹⁴ complement each other in terms of underlying technology availability, use case requirements and deployment scenarios. They enable reduction of IoT module cost, up to 10 years battery lifetime and extended network coverage.

Share of customers that believe connected devices would give additional advantages to the user (percent)



Source: Ericsson ConsumerLab, Analytical Platform (2015)
Base: Internet users aged 15–69 in Poland and Russia

¹¹ Ericsson ConsumerLab, Connected Homes (2015)

¹² Ericsson ConsumerLab, Analytical Platform (2015)

¹³ Ericsson ConsumerLab, TV and Media Report (2016)

¹⁴ Such as EC-GSM-IoT, Cat-M1 and NB-IoT

Ericsson is the driving force behind the Networked Society – a world leader in communications technology and services. Our long-term relationships with every major telecom operator in the world allow people, businesses and societies to fulfill their potential and create a more sustainable future.

Our services, software and infrastructure – especially in mobility, broadband and the cloud – are enabling the telecom industry and other sectors to do better business, increase efficiency, improve the user experience and capture new opportunities.

With more than 115,000 professionals and customers in 180 countries, we combine global scale with technology and services leadership. We support networks that connect more than 2.5 billion subscribers. Forty percent of the world's mobile traffic is carried over Ericsson networks. And our investments in research and development ensure that our solutions – and our customers – stay in front.