GSMA

The Mobile Economy Eurasia 2025

GSMA

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Contents

Executive summary

Governments in Eurasia are increasingly using mobile connectivity as a platform to transform their countries into modern digital economies. This shift is driven by the recognition that robust digital infrastructure, particularly mobile networks, improves public services and unlocks economic growth. Across the region, mobile connectivity is enabling citizens to engage with e-government systems and access education, healthcare and emergency services, even from remote and mountainous regions. By the end of 2024, two thirds of Eurasia's population used mobile internet, equating to 164 million users. Progress has been made in extending mobile connectivity to underserved areas, with the coverage gap narrowing considerably in recent years. The usage gap remains significant, although it varies across the region, ranging from over 50% in Tajikistan and Turkmenistan to less than 25% in Russia.

In 2024, mobile technologies and services generated 7.7% of GDP across Eurasia, a contribution that amounted to $220 billion of economic value. By 2030, the contribution of mobile technologies to economic output in the region is expected to rise to $270 billion, equivalent to 8.3% of GDP. 4G is the dominant mobile technology in Eurasia, accounting for around three quarters of mobile connections, but this is expected to peak in 2025 before gradually declining over the next few years as 5G deployments begin to gather speed. To date, eight operators from four countries in Eurasia have launched commercial 5G services, while an additional nine operators have announced plans to roll out 5G in the coming years.

Key trends shaping the mobile ecosystem

Still early days for 5G but momentum is building

The 5G landscape in Eurasia presents a mixed picture. Although commercial 5G services have been available in Tajikistan and Uzbekistan for over four years, the technology is still in pre-commercial stages in several countries, including Belarus, Kyrgyzstan and Russia. In the countries where 5G is available, the initial emphasis has been on enhancing mobile broadband services, especially in urban areas, to increase 4G capacity in densely populated locations. However, there is a case to leverage 5G fixed wireless access (FWA) to meet the growing demand for enhanced connectivity in homes and enterprises across Eurasia.

Energy efficiency becomes a top priority

In Eurasia, fossil fuels have historically been a cheaper energy source to provide electricity in rural areas. However, operators are increasingly aligning with global trends by adopting the latest technologies to enhance energy efficiency. Many are integrating renewable energy sources such as solar and wind power to reduce dependency on traditional fossil fuels. These advancements not only improve operational sustainability, but also ensure more reliable telecoms services in remote areas and help operators to overcome the use of diesel.

AI opens up new opportunities to serve enterprises

The telecoms industry has been at the forefront of AI adoption, with application in areas such as network operations, energy optimisation, customer call centres for automatic language recognition and retail operations. While early deployments have focused on internal solutions to improve network performance and customer services, there is a growing shift towards developing AI solutions for external customers, particularly in the enterprise segment, as a means of generating new revenue opportunities.

Services matching the needs of digitally engaged consumers

Markets in Eurasia are transforming due to digital advancements, increased connectivity and rising smartphone adoption. Consumers, from urban youth to rural first-time internet users, are reshaping how services are accessed, content is consumed and financial transactions are conducted. Mobile operators are key enablers, driving digital engagement through entertainment, payments and service access. Evolving consumer behaviour is pushing innovation, particularly across gaming, video and streaming platforms, with trends such as cloud gaming, localised content and AI-driven super-apps emerging. As expectations rise, operators are adapting by enhancing connectivity, bundling services and expanding digital platforms to offer seamless and integrated experiences.

Policies for growth and innovation

Continued growth and innovation across the Eurasia region will depend on clarity on spectrum availability in the short and long terms, with roadmaps for low-, mid- and high-band spectrum. Licensing regimes can create a positive policy environment to encourage network development and quality. Regulatory certainty supports robust long-term investment, and mobile has the best chance to support economic growth if licences are assigned and renewed in a way that fosters growth.

Meanwhile, the ITU's World Radiocommunication Conference 2023 (WRC-23) opened the doors to a new era of connectivity and laid the spectrum foundations for mobile to progress into 5G-Advanced and 6G. Importantly, WRC-23 identified 6 GHz (6.425–7.125 GHz) for mobile use by countries in Europe, the Middle East, Africa, CIS, the Americas and Asia Pacific, and conditions for its use have been agreed in the ITU's Radio Regulations. 6 GHz spectrum will form a critical part of sustainable communications development. The enhanced mobile connectivity enabled by the band in wide-area, macro-cell networks will lay the foundations for inclusive and technology-driven progress in Eurasia and form a vital element of the region's digital ambitions.

The Mobile Economy Eurasia 2025

Unique mobile subscribers

2024 **194m**

79% penetration rate*

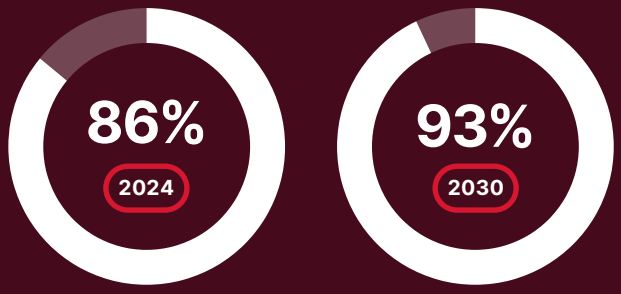
2030 **208m**

83% penetration rate*

**Percentage of population*

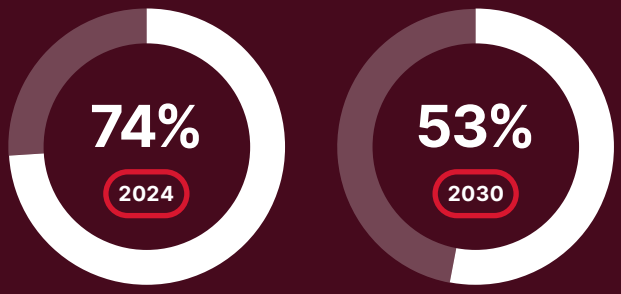
Smartphones

(percentage of connections)



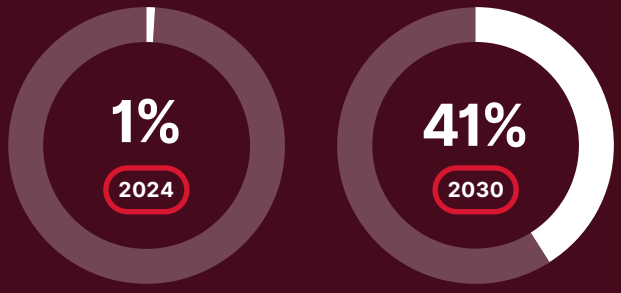
Excluding licensed cellular IoT

4G (percentage of connections)



Excluding licensed cellular IoT

5G (percentage of connections)



Excluding licensed cellular IoT

Mobile internet users

2024 **164m**

67% penetration rate*

2030 **182m**

73% penetration rate*

**Percentage of population*

Operator revenues and investment

2024 **$20bn**

2030 **$23bn**

Operator capex of **$31 billion** for the period 2024–2030

Mobile's contribution to GDP

2024 **$220bn**

7.7% of GDP

2030 **$270bn**

8.3% of GDP

Public funding

2024 **$12bn**

Mobile ecosystem contribution to public funding (before regulatory and spectrum fees)

Employment

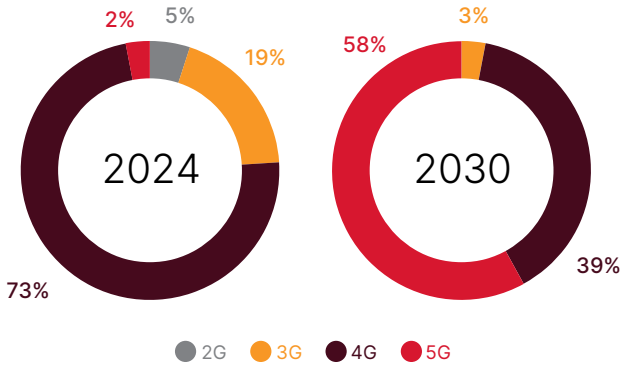
2024 **420k** jobs directly supported by the mobile ecosystem

200k jobs indirectly supported

Subscriber and technology trends for key markets

Belarus

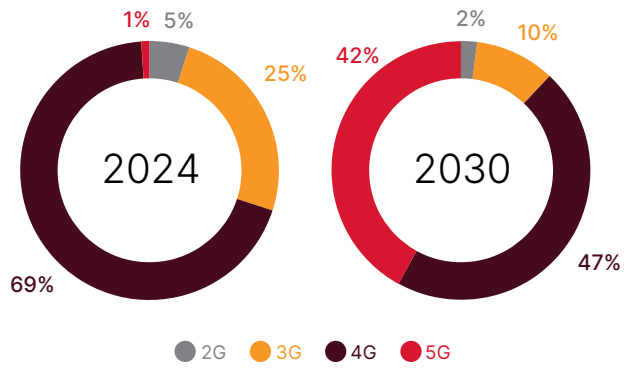
Technology mix*



Subscriber penetration		Smartphone adoption	
2024	79%	2024	89%
2030	86%	2030	93%

Kazakhstan

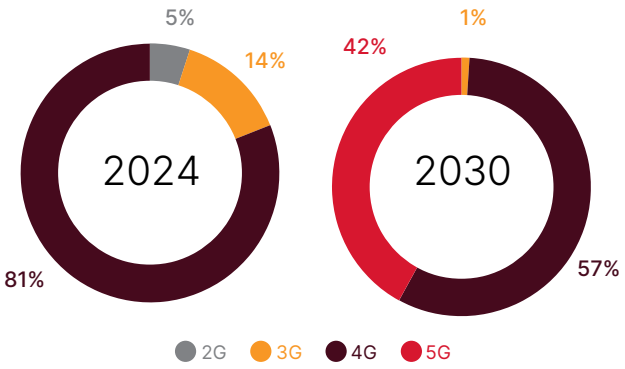
Technology mix*



Subscriber penetration		Smartphone adoption	
2024	73%	2024	85%
2030	79%	2030	94%

Russia

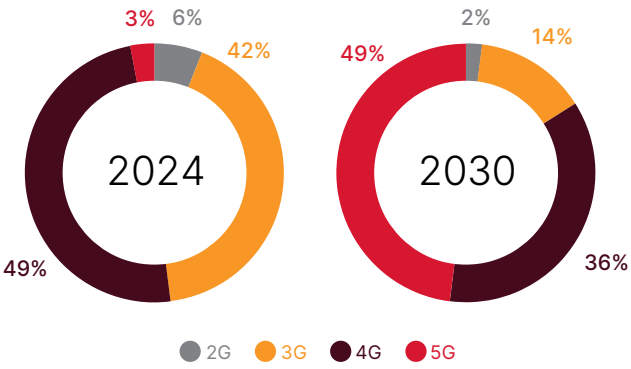
Technology mix*



Subscriber penetration		Smartphone adoption	
2024	85%	2024	85%
2030	88%	2030	93%

Uzbekistan

Technology mix*



Subscriber penetration		Smartphone adoption	
2024	69%	2024	89%
2030	78%	2030	93%

* Percentage of total connections (excluding licensed cellular IoT)
Note: Totals may not add up due to rounding.

01

The mobile industry in numbers

1.1
Mobile market update

More than 180 million people will subscribe to mobile internet services in Eurasia by 2030

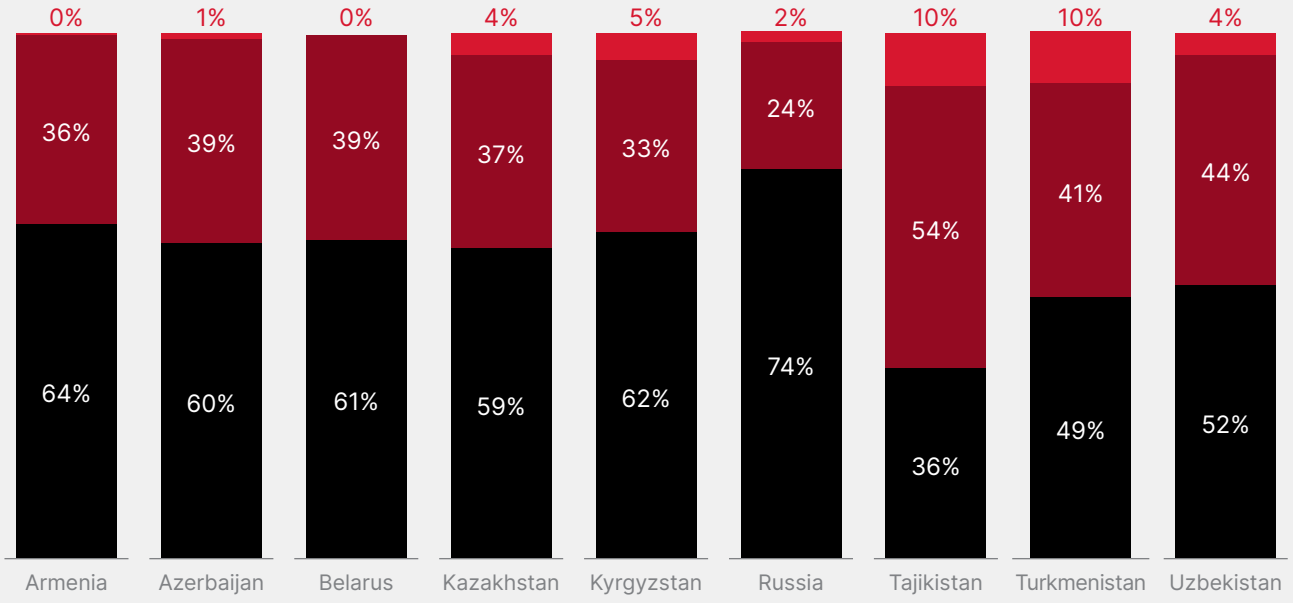
By the end of 2024, two thirds of Eurasia's population used mobile internet, equating to 164 million users – an increase of 40 million since 2015. Of the 80 million people who remain unconnected to mobile internet, close to 90% live in an area already covered by mobile broadband but do not use mobile internet. This usage gap varies considerably across the region, ranging from over 50% in Tajikistan and Turkmenistan to less than 25% in Russia.

Nearly 20 million new mobile internet users will be added between 2024 and 2030, driving mobile internet adoption to 73%. In the same period, the percentage of the population subscribing to mobile services will increase from 79% to 83%, highlighting the narrowing gap between mobile and mobile internet adoption.

Figure 1

Eurasia: mobile internet connectivity

Percentage of population



Connected:
Those who use mobile internet.

Usage gap:
Those who live within the footprint of a mobile broadband network but do not use mobile internet services.

Coverage gap:
Those who live in an area not covered by a mobile broadband network.

Note: Totals may not add up due to rounding.
Source: GSMA Intelligence

4G adoption to decline as 5G adoption ramps up

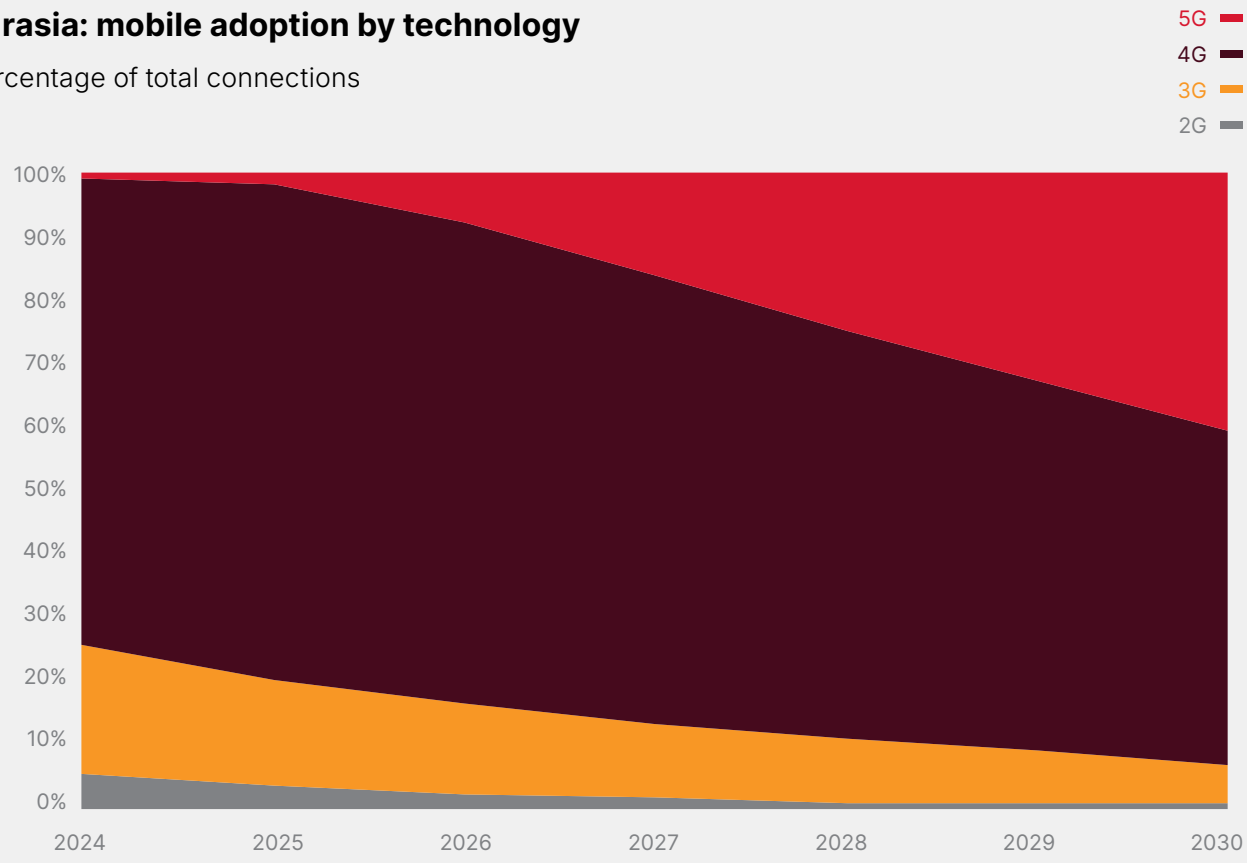
4G is the dominant mobile technology in Eurasia, accounting for around three quarters of mobile connections. However, 4G adoption is expected to peak in 2025 before gradually declining over the next few years as 5G deployments begin to gather speed.

2G and 3G's share of mobile connections will also erode during the forecast period, dropping from a combined 25% in 2024 to 7% in 2030. As the end of the decade approaches, operators will step up plans to retire legacy networks, enabling them to repurpose spectrum for more efficient 4G and 5G networks. Kazakhstan and Russia are currently the only countries in the region where operators have announced 3G sunset plans.

Figure 2

Eurasia: mobile adoption by technology

Percentage of total connections



Source: GSMA Intelligence

There will be 140 million 5G connections in Eurasia by 2030

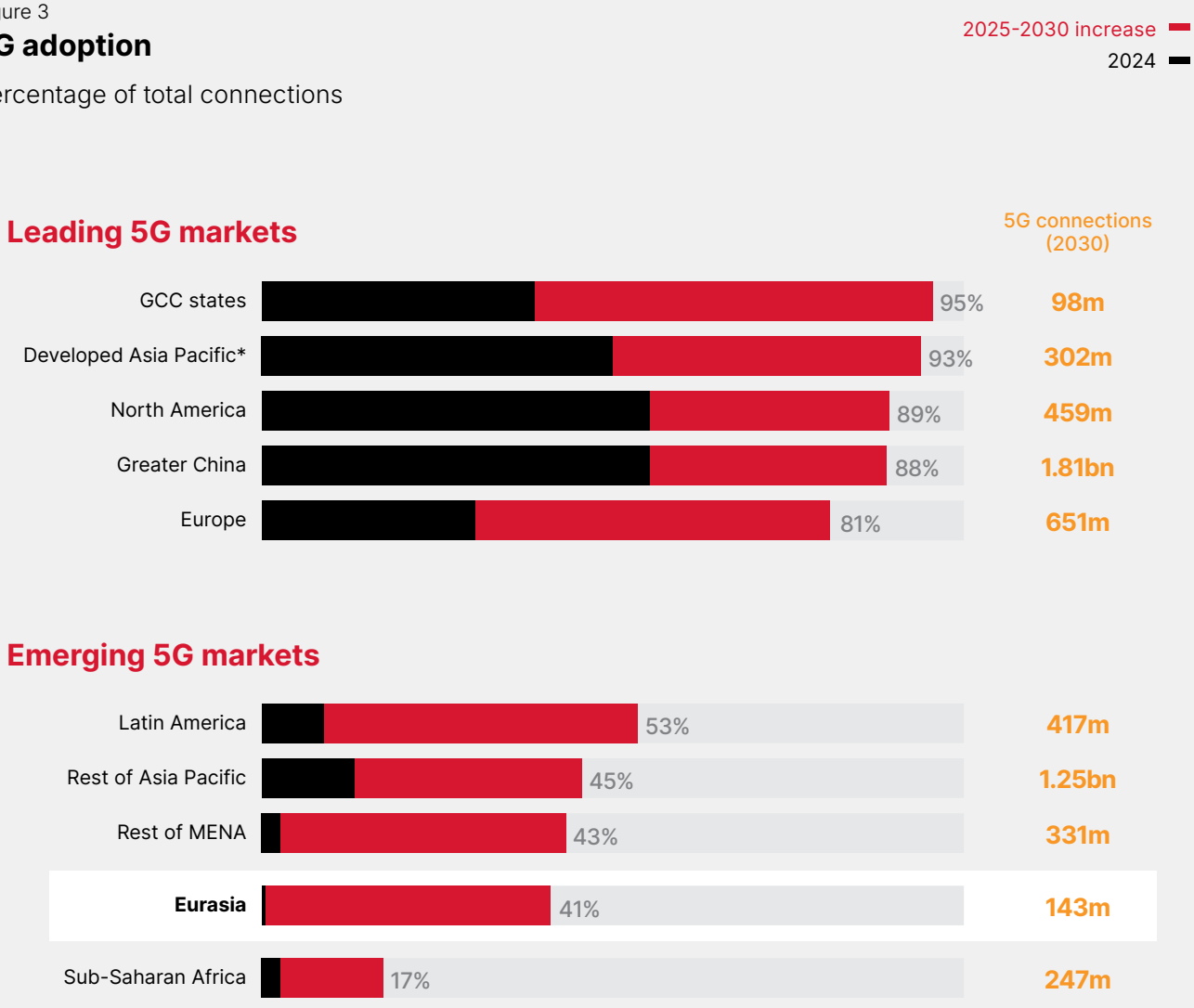
Eight operators from four countries in Eurasia (Armenia, Kazakhstan, Tajikistan and Uzbekistan) have launched commercial 5G services, while an additional nine operators have announced plans to roll out 5G in the coming years. All operators are using a non-standalone (NSA) architecture to deploy 5G services, leveraging the 4G core network to deploy 5G services more quickly and cost effectively.

5G adoption in Eurasia remains niche, accounting for 1% of connections at the end of 2024. The arrival of more affordable 5G devices alongside new 5G deployments is expected to propel 5G adoption in the second half of the 2020s. 5G will account for over 40% of mobile connections by the end of 2030, putting Eurasia in the middle of the pack among emerging 5G markets.

Figure 3

5G adoption

Percentage of total connections



* Australia, Japan, New Zealand, Singapore and South Korea
Source: GSMA Intelligence

Mobile data traffic in Eurasia will more than double in the period to 2030

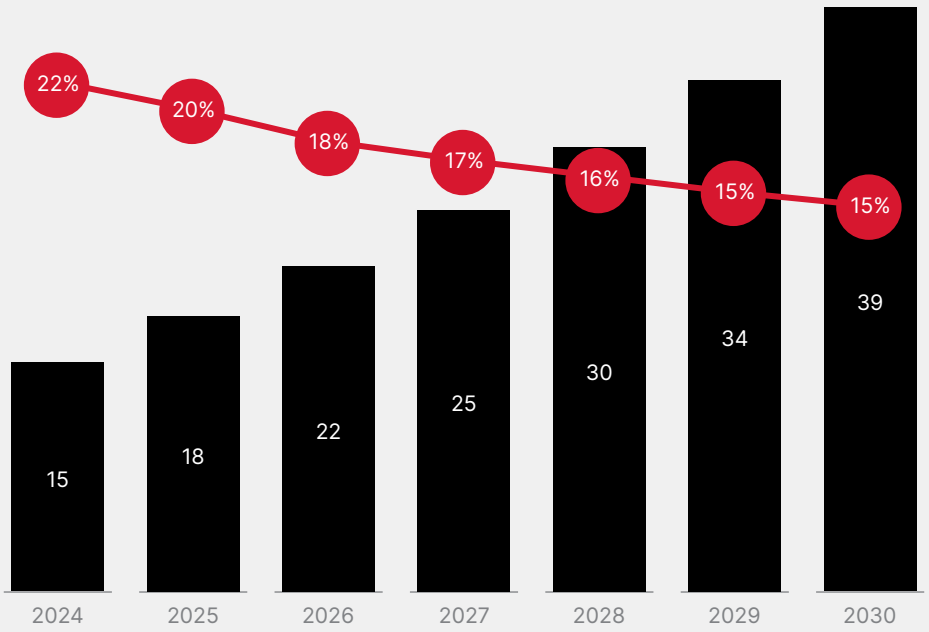
Average data traffic per mobile connection per month in Eurasia reached 15 GB in 2024, up from 4 GB in 2019, representing a CAGR of 30%. Although data growth rates are expected to slow, mobile data traffic will continue to grow by 15–20% per year through to the end of the decade, reaching nearly 40 GB per mobile connection on average by 2030.

Growth in mobile data consumption will be underpinned by the growing demand for localised content and services, including video, gaming and social media applications. This opens up new opportunities for operators to diversify their revenue streams. Veon is one operator leading the way in this area. The operator recently reported that more than 80% of its telecoms customers purchase digital services from it, with the operator's digital services revenue growing above 60% year on year.[1]

Figure 4

Eurasia: mobile data traffic per connection

GB per month



Source: GSMA Intelligence

1. "Veon boss insists digital services are the telco future", Mobile World Live, March 2025

Mobile revenues in Eurasia to surpass $23 billion by the end of the decade

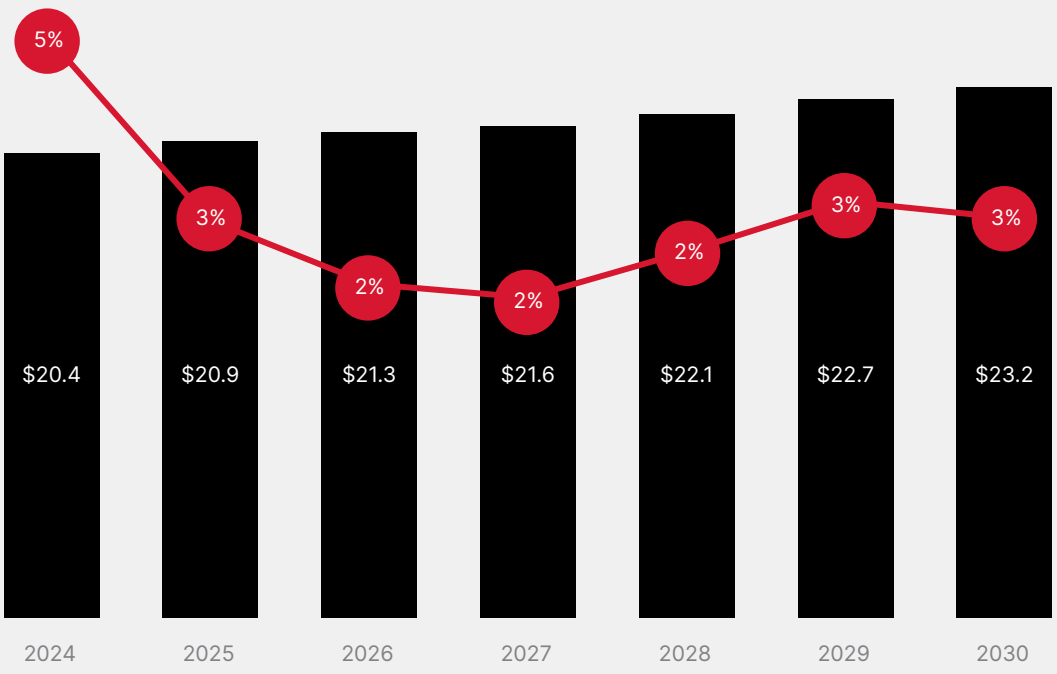
Annual mobile revenue growth in Eurasia is projected to be between 2% and 5% through to the end of the decade. Uzbekistan is expected to experience the fastest revenue growth in Eurasia during this period. For example, Beeline Uzbekistan is predicting a 2.5× increase in total revenues between 2023 and 2027, driven by an increase in data and digital services revenue.

On the cost side, operators will invest substantially in deploying network infrastructure. Between 2024 and 2030, operators in Eurasia are forecast to invest $31 billion in mobile capex. The majority of network spending will be on the deployment of 5G infrastructure. Operators will also continue to spend on network coverage expansion in rural areas, though new network-sharing agreements should help to reduce these costs.[2]

Figure 5

Eurasia: mobile revenue and annual growth

Billion



Source: GSMA Intelligence

2. For example, see "MTS, A1 Belarus expand RAN sharing", Telecompaper, December 2024

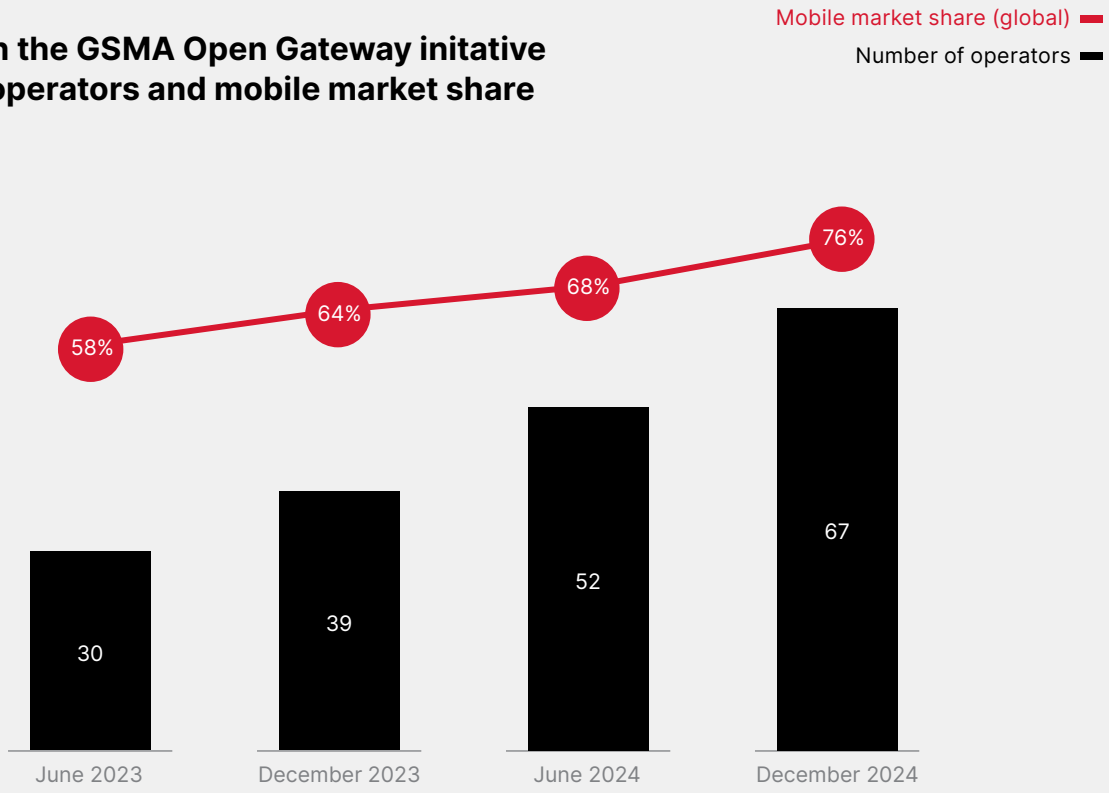
GSMA Open Gateway continues to build momentum

Pressure on connectivity revenues is driving efforts in new areas. One such example is the GSMA Open Gateway, which aims to leverage the power of mobile networks globally by opening up access to network capabilities through common APIs. As of March 2025, 72 mobile operators had committed to Open Gateway APIs. These account for almost 80% of mobile market share by connections, up from just over 65% in June 2024.

The focus in 2025 will be on translating these commitments into further commercial launches. Veon's Geolocation Gateway is an early example of a solution that builds on the GSMA Open Gateway framework, leveraging the Device Location API. The Geolocation Gateway allows applications to determine the location of devices, which enables a wide range of use cases, including proximity-based commercial services (e.g. location-based marketing), fraud reduction and location-based emergency response.

Figure 6

Participation in the GSMA Open Gateway initative by number of operators and mobile market share



Source: GSMA Intelligence

1.2
Economic impact of mobile

Mobile added $220 billion to the Eurasian economy in 2024

In 2024, mobile technologies and services generated 7.7% of GDP across Eurasia, a contribution that amounted to $220 billion of economic value added.[3] The greatest benefits came from the productivity effects reaching $190 billion, followed by the direct contribution, which generated $30 billion.

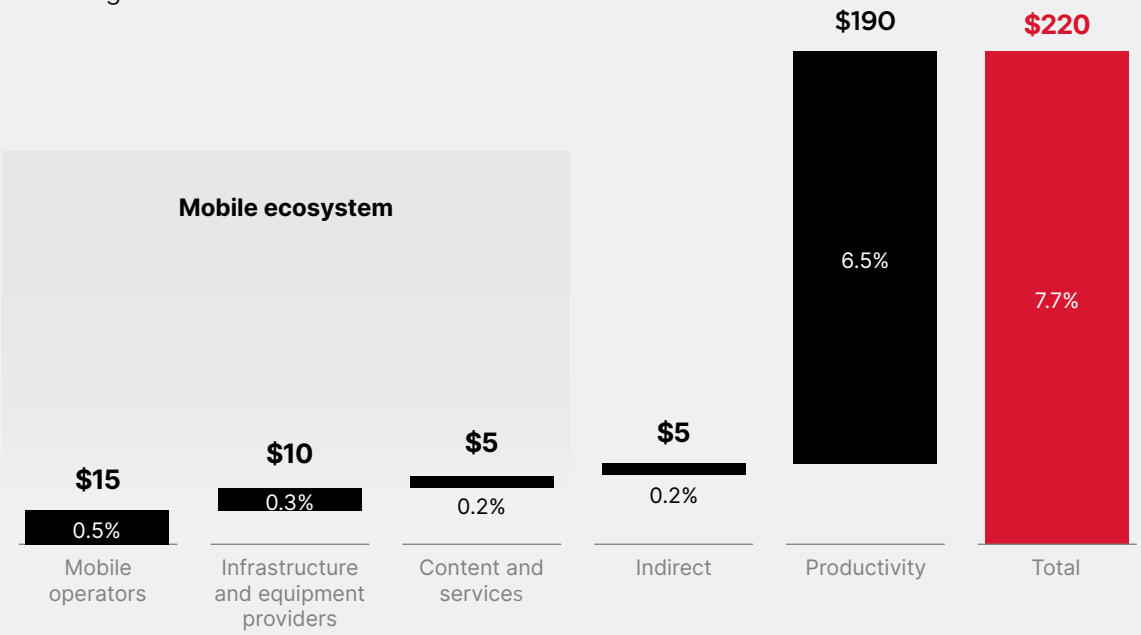
The impacts of mobile technologies include connectivity and digital transformation. The former refers to the use of mobile technologies. The latter involves the integration of advanced mobile technologies such as 5G, IoT and AI by enterprises.

The mobile ecosystem is formed of three categories: mobile operators; infrastructure and equipment; and content and services. The infrastructure and equipment category encompasses network equipment providers, device manufacturers and IoT companies. Meanwhile, the content and services category encompasses content, mobile application and service providers, distributors and retailers, and mobile cloud services.

Figure 7

Eurasia: economic contribution of mobile, 2024

Billion, percentage of GDP



Note: Totals may not add up due to rounding.
Source: GSMA Intelligence

3. The Mobile Economy Eurasia 2024 report forecast that mobile services and technologies would contribute $220 billion by 2030. In this year's report, the economic impact model includes the benefits of the enterprise digital transformation driven by the adoption of advanced digital technologies.

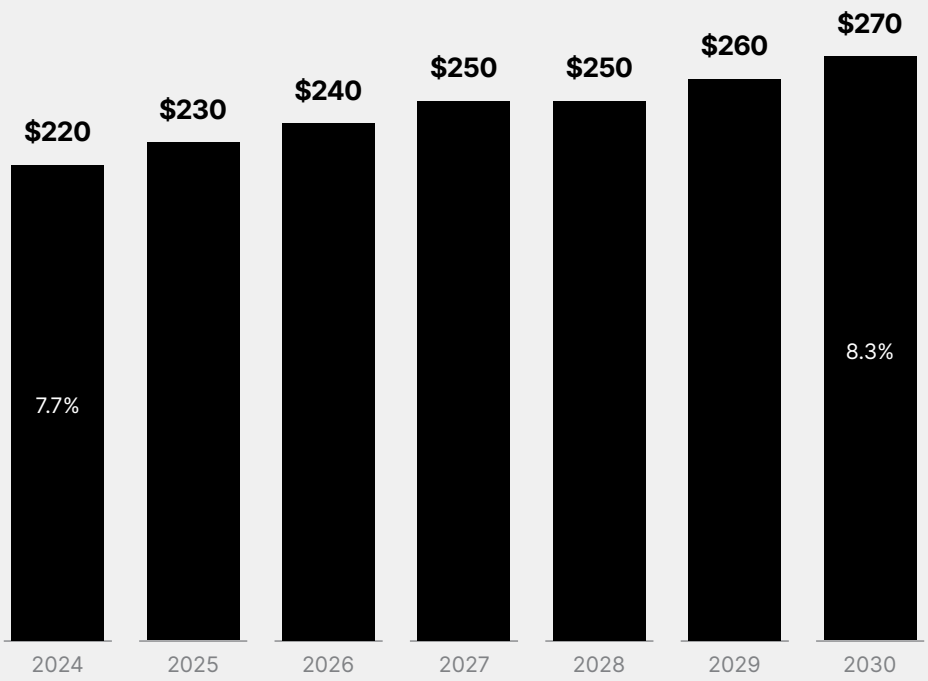
Mobile's economic contribution in Eurasia will reach $270 billion by 2030

By 2030, mobile's contribution in Eurasia is expected to reach approximately $270 billion, or 8.3% of GDP, driven by the improvements in productivity and efficiency brought about by the continued expansion of mobile services and the growing adoption of digital technologies, including 5G, IoT and AI.

Figure 8

Eurasia: economic impact of mobile

Billion, percentage of GDP



Source: GSMA Intelligence

The mobile ecosystem in Eurasia supported 620,000 jobs in 2024

Mobile operators and the wider mobile ecosystem provided direct employment to approximately 420,000 people in Eurasia in 2024. In addition, economic activity in the ecosystem generated around 200,000 jobs in other sectors, meaning that around 620,000 jobs were directly or indirectly supported.

Figure 9

Eurasia: employment impact of the mobile ecosystem, 2024

Jobs (thousand)

Source: GSMA Intelligence

The fiscal contribution of the mobile ecosystem in Eurasia reached $12 billion in 2024

In 2024, the mobile sector in Eurasia made a substantial contribution to the funding of the public sector, with around $12 billion raised through taxes. A large contribution was driven by services VAT, sales taxes and excise duties generating $5 billion, followed by employment taxes and social security at $4 billion.

Figure 10

Eurasia: fiscal contribution of the mobile ecosystem, 2024

Billion

Source: GSMA Intelligence

5G and its ecosystem will significantly boost GDP in Eurasia by the end of the decade

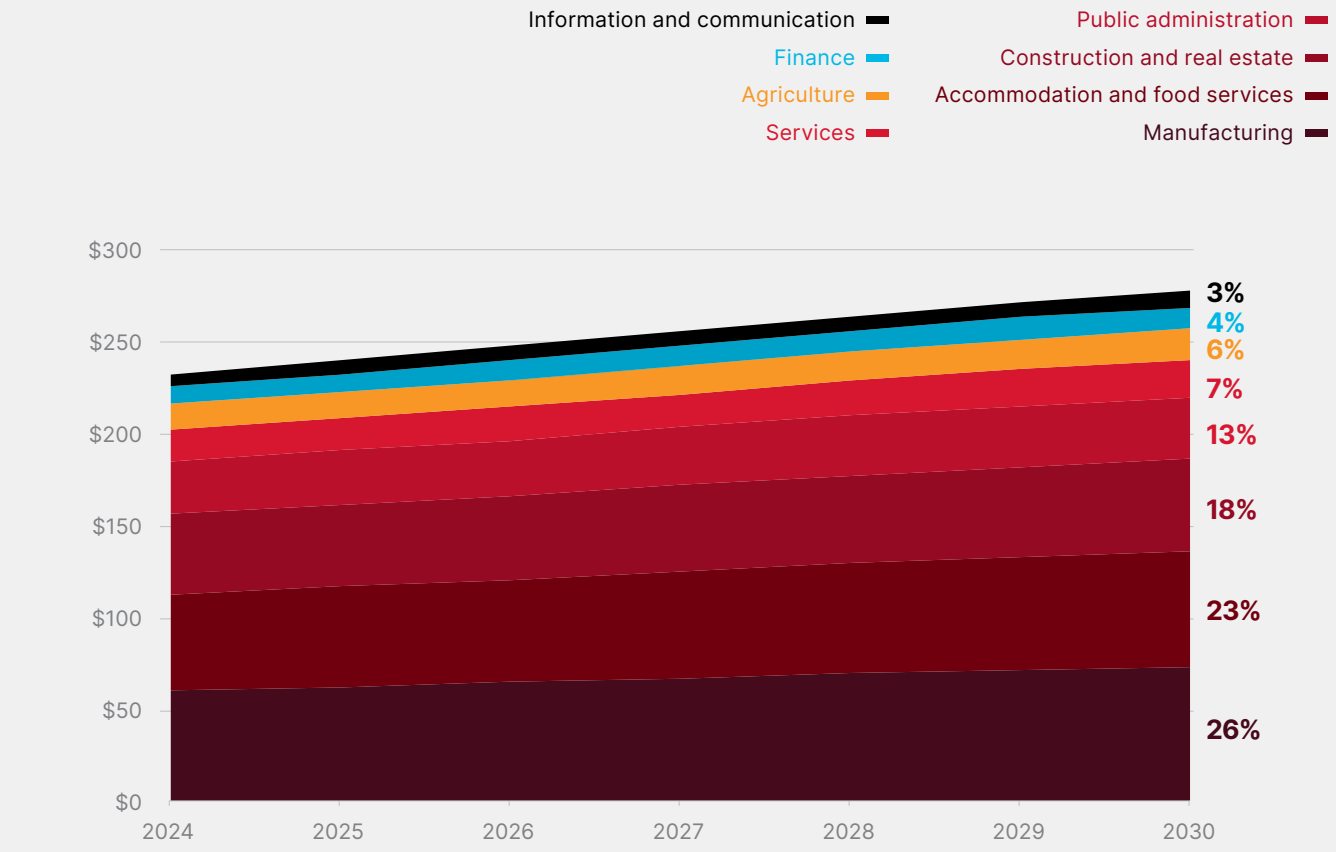
Mobile technologies and the ensuing digital transformation are expected to benefit the Eurasian economy by around $270 billion in 2030. Much of this will materialise between 2024 and 2030, fuelled by the rapid adoption of advanced mobile technologies.

Mobile technologies are expected to benefit all sectors of the Eurasian economy, though some industries will benefit more than others due to their ability to incorporate the latest wave of digital technologies, including 5G, IoT and AI. These gains will stem from new revenue streams and improvements in productivity and efficiency enabled by the growing adoption of digital technologies. Between 2024 and 2030, 26% of the benefits are expected to originate from the manufacturing sector.

Figure 11

Eurasia: mobile technologies' contribution to GDP by industry

Billion



Source: GSMA Intelligence

02

Mobile industry trends

2.1
5G: the industry focus shifts to realising 5G's full potential

5G is now in its sixth year since launch and commercially available in more than 120 countries, underlining the technology's growing maturity and reach. By the end of 2025, 5G connections will account for nearly a third of global mobile connections. For comparison, 3G and 4G accounted for 10% and 15% of total connections, respectively, at the same point in their deployment cycles. The rapid uptake of 5G has been driven by a combination of factors, including the availability of more affordable devices (especially in lower-income markets), increased demand from consumers and businesses seeking faster speeds, and operator investment in spectrum and infrastructure upgrades.

The 5G landscape in Eurasia presents a mixed picture. Although commercial 5G services have been available in Tajikistan and Uzbekistan for over four years, the technology is still in pre-commercial stages in several countries, including Belarus, Kyrgyzstan and Russia. The slow pace of 5G development in these markets reflects the impact of various factors, some of which require urgent attention to accelerate progress. One notable factor is spectrum availability and allocation, particularly in the mid-band (3.4–3.8 GHz), which has been crucial to 5G deployments around the world. In several countries in the region, spectrum in this band is not fully available or has not been allocated to operators, thereby delaying full deployment and forcing operators to test alternative frequencies.

The deployment of 5G across Eurasia will follow a phased approach, supported by sufficient demand to justify the business case, enabling regulations and the availability of 5G-enabled devices at price points that encourage mass adoption

In the four countries where 5G is available (Armenia, Kazakhstan, Tajikistan and Uzbekistan), the initial emphasis has been on enhancing mobile broadband services, especially in urban areas, to increase 4G capacity in densely populated locations. However, by the end of 2025, 5G coverage is expected to expand to other areas, as underscored by recent developments:

- In December 2024, Armenia's Public Services Regulatory Commission (PSRC) said it expects the 5G network will cover at least 60% of urban highways and 10% of interstate highways across the country. And in November, Ucom announced the completion of the first phase of its 5G network rollout, covering nine cities.
- Uztelecom has upgraded and deployed over 3,500 base stations across Uzbekistan as part of its 'Season of Renewal' project, which could facilitate extending 5G networks beyond Tashkent, the capital.
- In Kazakhstan, mobile operators plan to broaden 5G coverage in cities such as Astana, Almaty and Shymkent and regional centres by the end of 2025.

The deployment of 5G across Eurasia will follow a phased approach, supported by sufficient demand to justify the business case, enabling regulations (particularly around spectrum availability and allocation) and the availability of 5G-enabled devices at price points that encourage mass adoption. The technology will also play a vital role in achieving the ambitious digitalisation goals of various countries in the region, underscoring the need for policymakers to create a conducive environment for 5G investments and innovation.

The case for 5G FWA in Eurasia

Technological improvements have made 5G FWA a viable alternative to established fixed solutions. As a result, 5G FWA has become a global phenomenon and a crucial 5G use case for operators. By the end of 2024, a total of 146 operators in 72 markets around the world had launched 5G FWA services, equivalent to 48% of 5G providers globally. 5G FWA offers operators opportunities to drive revenue growth and serve new market segments; better utilise existing network assets, including spectrum, towers and backhaul; deliver high-speed broadband connectivity in a timely and cost-effective manner; upgrade customers on older wireless broadband technologies, such as 4G FWA; and reduce churn.

In most markets, four deployment scenarios have emerged for operators looking to realise the FWA opportunity:

- **Primary broadband:** Targeting first-time fixed broadband users in emerging markets, such as in Eurasia, particularly in underserved/rural areas. This can be cost effective compared to FTTx, particularly where new fibre infrastructure needs to be built.
- **Competing broadband:** Targeting fixed broadband users looking for faster speeds and/or quicker installation, such as in markets where fibre infrastructure is concentrated in large urban areas.
- **Complementary alternative:** Complementing fibre offerings, generally in urban and suburban areas with difficult terrain and/or regulatory red tape, or areas with few fixed broadband alternatives.
- **Enterprise opportunity:** Targeting enterprises that have few alternatives, including temporary work sites, such as construction zones, and large campuses that do not require permanent wiring.

The fixed broadband landscape in Eurasia varies considerably, with household penetration of more than 30% in Belarus, Kazakhstan and Russia, but generally lower than 20% elsewhere. Although the region has seen a significant rise in mobile internet connections over the last five years, driven by operator investment in mobile broadband networks and rising smartphone adoption, there is a need to close the household connectivity gap.

5G FWA provides a credible option for operators to meet the growing demand for enhanced connectivity in homes and enterprises to support a growing array of connected devices. This is especially true in Eurasia, considering the region's difficult topology and sparsely populated rural areas, which makes fixed broadband deployment in the last mile expensive and time-consuming. As such, there is a strong case for operators in the region to consider deploying 5G FWA from the start of their 5G journeys, leveraging strong consumer interest in the service and the large addressable market for fixed broadband connectivity to homes and enterprises.

2.2
Energy efficiency: renewable energy and greater efficiency transforming network operations

Energy efficiency in telecommunications is becoming essential globally. 2025 marks a critical milestone for sustainable operations, as many operators have set net-zero targets for this year. In Eurasia, fossil fuels have historically been a cheaper energy source to provide electricity in rural areas. However, energy prices are no longer as low as before, making efficient energy management a growing priority for the region. Furthermore, the low density of populations, the lack of renewable electricity via the grid and the state of the electricity grids can be a challenge for network operators.

Mobile operators in Eurasia are aligning with global trends by adopting the latest technologies to enhance energy efficiency. Many are integrating renewable energy sources such as solar and wind power to reduce dependency on traditional fossil fuels. These advancements not only improve operational sustainability, but also ensure more reliable telecoms services in remote areas and help operators to overcome the use of diesel.

Driven by concerns over energy security in recent years, the rising importance of energy sustainability and the potential for increasing energy prices, operators in Eurasia are expected to invest more in green and energy-efficient technologies. Expanding the use of renewable energy and energy-efficient solutions will be key to achieving long-term economic and environmental benefits in the region's telecoms sector.

Energy efficiency plays a critical role, but effectively measuring energy efficiency remains a complex challenge due to the diverse nature of networks, varying traffic patterns and the interplay of different energy sources. Recognising the significance of this issue, the GSMA Intelligence Energy Efficiency Analysis and Benchmarking project helps operators measure and compare energy efficiency across their networks.[4] The initiative provides a standardised framework for assessing energy performance, allowing operators to identify areas for improvement and implement best practices. It remains challenging to draw definitive conclusions about year-on-year changes, however, due to the steadily growing number of network operators included in the study each year.

Beeline's solar power initiative to connect remote areas in Kazakhstan

In 2023, Beeline deployed solar-powered network equipment to provide 4G connectivity in remote, hard-to-reach areas of Kazakhstan. This initiative aimed to extend network coverage in areas with limited access to the electricity grid, in a cost-effective and more environmentally sustainable way. Each site consists of 12 solar panels, producing up to 4 kWh of energy during peak periods, which is sufficient to ensure stable 4G voice and mobile internet connectivity in villages.

4. Going green: measuring the energy efficiency of mobile networks, GSMA Intelligence, 2025

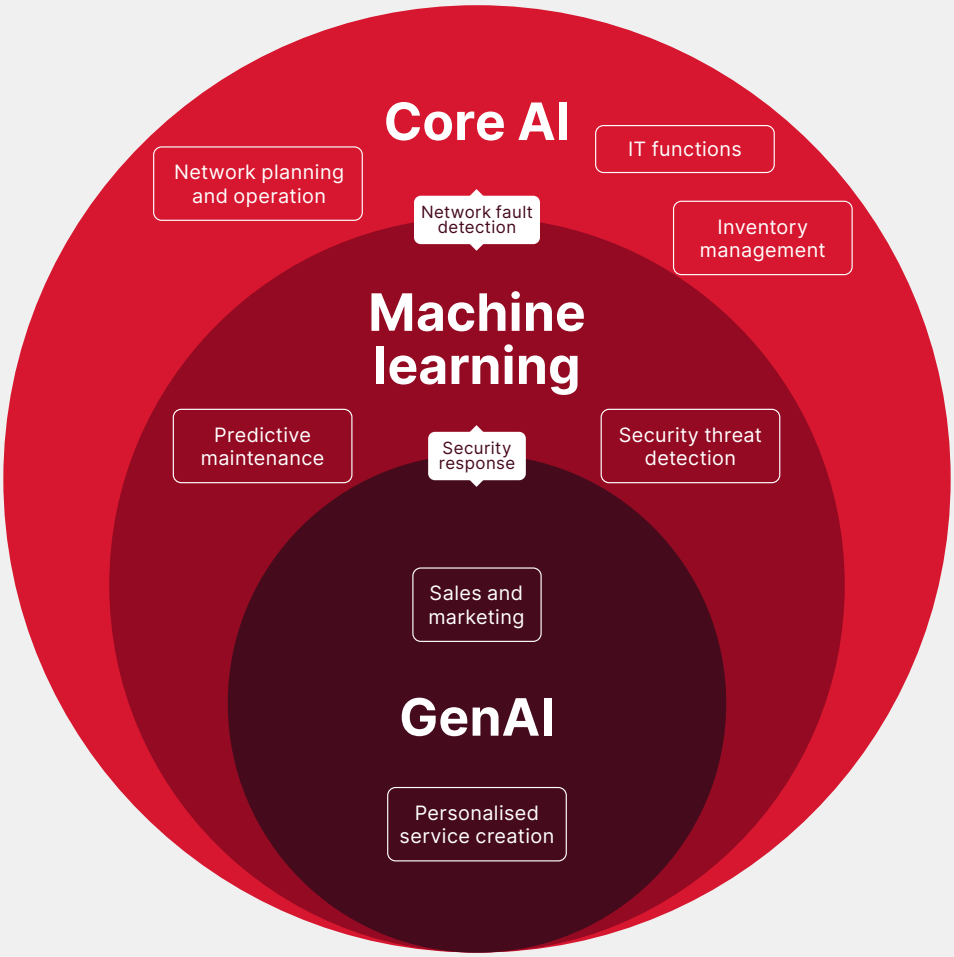
2.3
AI: new opportunities to serve enterprises

The telecoms industry has been at the forefront of AI adoption, with applications in areas such as network operations, energy optimisation, customer call centres and retail operations. In recent years, operators have explored solutions to improve operational efficiency, tackle emerging and increasingly sophisticated threats and meet evolving customer expectations. The AI landscape continues to evolve, with new developments and innovations from operators, network vendors, cloud providers and the broader digital ecosystem.

Each advancing level of AI offers different capabilities and/or deeper intelligence. At its simplest, core AI is the application of intelligence in machines. Machine learning extends this by working with larger datasets. Generative AI (genAI) goes further to enable content creation without the need for defined input parameters. Given the plethora of options, the value of AI for operators is a function of selecting the right approach and technology for the right use case.

Figure 12

Examples of telco-specific use cases for AI



Source: GSMA Intelligence

Early deployments have focused on internal solutions to improve performance across the layers of the telecoms value chain, such as network fault detection and automating more functions used in customer-care centres. For example, Beeline has been actively investing in AI across its global operations, including in Kazakhstan, to optimise network performance and customer service. Meanwhile, MTS has been leveraging AI in network operations across its footprint, collaborating with various vendors, including Huawei, to test AI-enabled 5G networks, focusing on self-optimising networks that adjust in real time to usage demands.

However, there is a growing shift to developing solutions for the enterprise segment to generate new revenue opportunities from AI capabilities. Operators in Eurasia are increasingly taking advantage of this opportunity. Table 1 highlights examples of operator activity in this area.

Table 1

Examples of operator activities in AI in Eurasia

Operator	Activity
Beeline	Veon's global 'AI-first' strategy includes offering businesses predictive analytics tools powered by AI to optimise supply chains and customer interactions. In Kazakhstan, Beeline has partnered with local enterprises in sectors such as retail and logistics, using AI-driven insights from network data to help companies forecast demand and improve operational efficiency.
MegaFon	MegaFon's IoT platform uses AI to process data from connected devices, offering real-time insights to sectors such as agriculture and transportation. For example, MegaFon has worked with Russian agribusinesses to deploy AI-driven monitoring of soil and weather conditions through its network, improving yield predictions.
MTS	MTS's cloud platform uses AI to offer businesses scalable computing, data storage and analytics solutions. For instance, MTS has deployed AI-powered predictive maintenance tools for manufacturing enterprises, helping firms such as Severstal to optimise equipment uptime by analysing sensor data from IoT devices connected via MTS's network.
Uztelecom	Uztelecom's AI-powered network monitoring tools help businesses to manage their internal IT infrastructure, while AI-driven IoT solutions for enterprises in transportation and utilities enable real-time data analysis for fleet management or energy optimisation.

Kaz-LLM: bridging the language gap in AI[5]

The rapid evolution of AI for high-resource languages in the digital domain, such as English, Mandarin and Spanish, highlights the risk of potentially excluding billions of people who speak low-resource languages – nearly 7,000 of them – from the world of AI. This scenario compounds the digital divide, restricting access to AI-powered services and marginalising communities that speak local, under-resourced languages. Furthermore, Unesco's warning that a language disappears every two weeks highlights the urgent need to combat this issue. Kazakh, spoken rarely outside of the 20 million population of Kazakhstan and with plenty of interference of languages such as Turkish, Russian and English, is a prime example of a language that would benefit from such a focus.

In this context, QazCode, the enterprise and IT services subsidiary of Beeline Kazakhstan, collaborated with various partners – including the Ministry of Digital Development, Innovation and Aerospace Industry of Kazakhstan, the GSMA Foundry and the Barcelona Supercomputing Center – to develop a large language model (LLM) for the Kazakh language, Kaz-LLM. With over 150 billion tokens collected, curated, synthesised and translated, Kaz-LLM was unveiled in December 2024 with 8-billion and 70-billion parameter versions, capable of interacting in the Kazakh language as well as in Turkish, English and Russian. Looking ahead, Beeline intends to make the service available to users across Kazakhstan and support the wider ecosystem to address the AI linguistic gap.

5. Making AI work for all: Bridging the language gap in AI by focusing on languages that are underrepresented in the digital world, GSMA, January 2025

2.4
Global digital transformation survey: understanding enterprise needs and supplier opportunities

Between June and August 2024, GSMA Intelligence surveyed nearly 4,200 enterprises across 21 countries and 10 verticals to gain insight into their digital transformation. The survey included 100 enterprises from Kazakhstan, providing insight into their strategic objectives, investment plans and priorities, deployment challenges and supplier decisions. The survey also asked enterprises for their views on a range of technologies enabling digital transformation, including 5G, private networks, AI, cloud, edge, IoT, eSIM, cybersecurity and network APIs. Key findings from the survey and the implications for mobile operators include the following:[6]

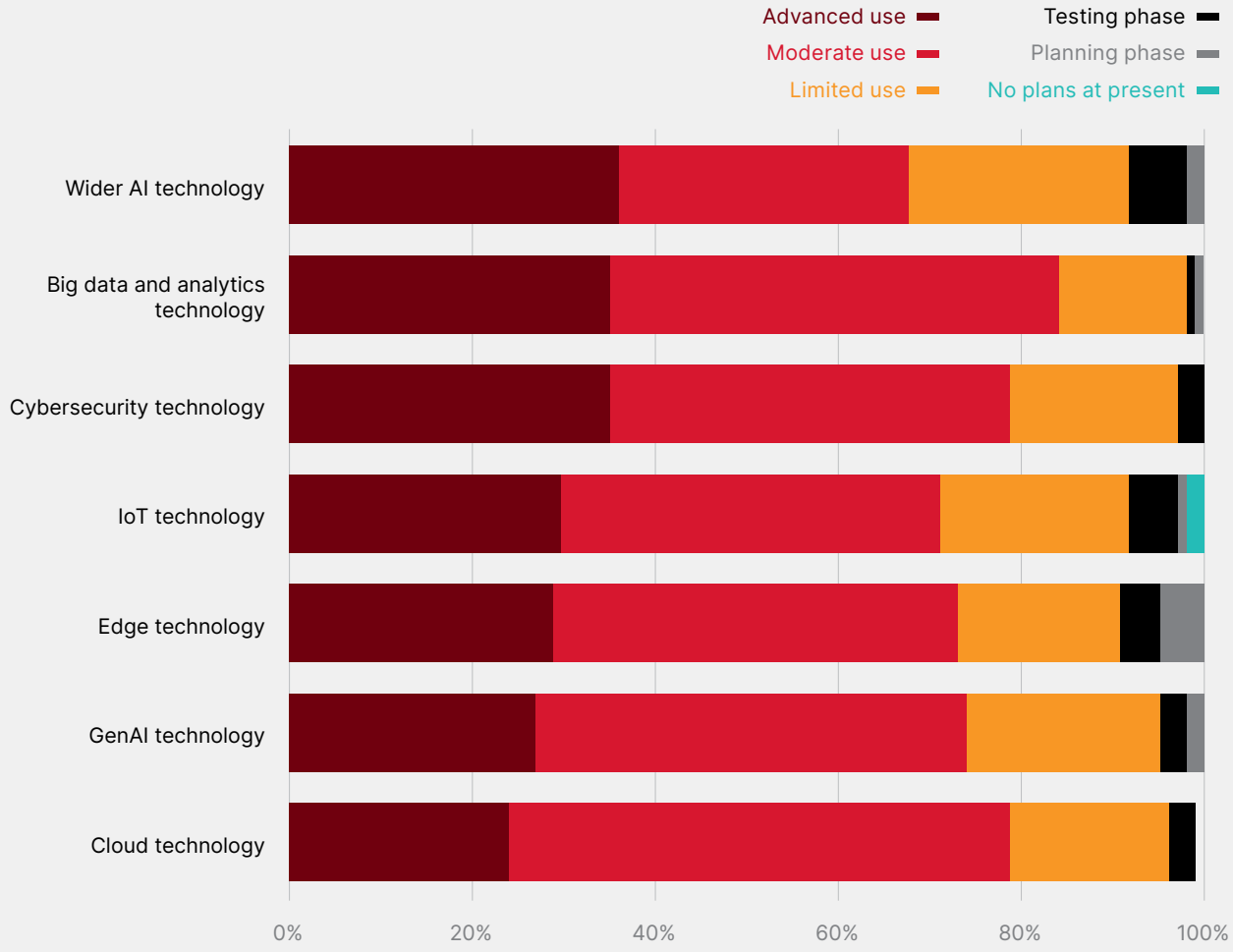
- **Boosting competitiveness is the top digital transformation priority in Kazakhstan**
  Enhancing security and protecting against cybersecurity threats ranked as the top digital transformation objective for enterprises globally. In Kazakhstan, however, strengthening their competitive positioning was the top digital transformation objective, with 50% of enterprises listing this as an extremely important objective (versus 47% for enhancing security). Other top priorities in Kazakhstan include increasing business revenues, enhancing customer experience and meeting sustainability targets – all of which were cited as extremely important by 40% of enterprises.
- **5G is seen as highly important to digital transformation**
  With 81% of Kazakhstani enterprises rating 5G networks and connectivity as important to the success of their digital transformation, 5G is among the most important enabling technologies in the country, along with AI, data analytics and cybersecurity. Enterprise interest in 5G should continue to grow as operators extend their 5G rollouts. For example, Kcell and Tele-Altel plan to jointly deploy 5G networks with an aim of covering 80% of the population by 2027.
- **The private 5G market begins to take shape**
  A smaller share of Kazakhstani enterprises (46%) view private networks as important to their digital transformation plans compared to public 5G. Nonetheless, there is growing demand for private networks in sectors with strict connectivity requirements and operations in remote areas. For example, Kcell has announced plans to deploy private 5G networks for mining companies to support digitisation and enable unmanned vehicles for risky and routine tasks. The operator has previously implemented private 4G networks for mining companies, including KAZ Minerals, Polymetal International and Eurasian Resources Group.
- **Kazakhstani enterprises explore the potential of genAI**
  Around a quarter of enterprises in Kazakhstan are currently making advanced use of genAI services, slightly below the average of 33% across the 21 countries surveyed. To drive further AI adoption, Veon introduced Kaz-LLM, aiming to enhance the availability of AI-powered tools within the country. These initiatives are crucial due to the limitations of many widely used LLMs, which are predominantly trained on English language content.

6. The rise of digital industries: navigating enterprise needs, investments and supplier decisions, GSMA Intelligence, 2024

Figure 13

Kazakhstan: state of use of technologies enabling digital transformation beyond connectivity

As part of your company's digital transformation, where are you in the process of using the following technologies? (Percentage of respondents)



Base: Enterprises in Kazakhstan undertaking digital transformation. Aggregate figures across all vertical sectors surveyed.
Source: GSMA Intelligence Enterprise in Focus: Global Digital Transformation Survey 2024

B2B offers significant growth opportunities for mobile operators

Operator strategies continue to evolve as the mobile industry seeks to capture new growth opportunities in the enterprise market. Most operators are pursuing dual strategies: leveraging enhanced, high-speed connectivity to provide incremental value to enterprise customers while also ramping up diversification efforts in non-connectivity services.

The expansion of 5G networks across Eurasia is expected to support these efforts and accelerate digital transformation in the region. In Armenia, for example, the Ministry of High-Tech Industry has announced plans to leverage 5G to facilitate the creation of smart cities and the development of industrial zones across the country. Similarly, other governments in the region are exploring how advanced connectivity can drive economic growth and technological innovation.

Building on the foundation of advanced connectivity, operators can explore the use of AI to capture growth in the enterprise market. For example, Uztelecom recently joined the Association of Artificial Intelligence of Central Asia (AICA), the largest community of experts and companies working in the field of AI in Central Asia. Through its AICA membership, the operator aims to strengthen its position in the field of AI and contribute to the development of new digital services in Eurasia. The move underlines how operators are well positioned to become critical partners in enabling next-generation enterprise solutions, driving both connectivity and innovation throughout the region.

Most operators are pursuing dual strategies: leveraging enhanced, high-speed connectivity to provide incremental value to enterprise customers while also ramping up diversification efforts in non-connectivity services

2.5
Consumer insights: evolving services and a rise in digitally engaged consumers

Countries in Eurasia are experiencing substantial transformations due to digital advancements, enhanced connectivity and increased smartphone usage. From urban youth to rural first-time internet users, a new generation of digitally engaged consumers is altering how services are accessed, content is consumed and financial transactions are conducted. Mobile operators are playing a key role in this shift by providing connectivity and enabling everyday digital life.

The advancement of devices, connectivity, platforms and services is meeting higher consumer expectations, offering opportunities for new and existing mobile ecosystem players.[7] One notable area that has evolved is digital entertainment (gaming, music and video). Our research shows a significant rise in the share of people watching videos on their mobile phones in Eurasia. In 2023, nearly 160 million people (85% of the population) used their devices to watch videos.[8] Recognising this potential, operators are altering services and products. The list below highlights some of the recent digital entertainment trends in the region:

- **Entertainment platforms with local language content**
  The use of smartphones for entertainment and watching videos has increased globally. In Eurasia, the availability of regional and local language content is a key driver. For example, Veon launched its digital entertainment platform Kinom in Uzbekistan in 2024. The platform is developed locally and offers more than 130 channels of linear TV and on-demand content, including local language content. As the operator expands its digital portfolio, it aims to provide accessible national language entertainment and a best-in-class digital experience while supporting the growth of local creative industries.[9]
- **Demand for cloud gaming with growing 5G**
  With the expansion of 5G connectivity in Eurasia, there is a growing demand for cloud gaming. 5G provides an enhanced experience and better speeds for these services. Network operators are concentrating on network and connectivity innovations to address this demand. The low-latency capabilities of 5G networks enable better performance in cloud gaming with real-time interaction, making cloud gaming more accessible on various devices.
- **Bundling services with super-apps and AI**
  In response to consumer demand, operators continue to create different entertainment packages, for example by bundling streaming platforms, cloud gaming services or e-learning subscriptions into mobile plans. In 2024, Veon launched the Hambi super-app in Uzbekistan, an AI-powered innovative platform that consolidates a comprehensive suite of digital services and connectivity into a single application. The super-app offers users a digital marketplace and entertainment, TV, fintech and gaming functionalities.[10]

Although the adoption of 5G technology and user satisfaction are both increasing, large-scale monetisation remains a significant challenge for the mobile industry. To unlock further revenue growth, operators need to broaden their service offerings by including value-added digital services, exploring new revenue models focused on consumer experience and integrating 5G offerings with high-value applications such as cloud gaming and metaverse experiences.

7. The changing shape of the digital consumer in 2025: insights from the Global Consumer Survey, GSMA Intelligence, 2024
8. Mobile's impact of the SDGs in Eurasia, GSMA, 2024
9. "VEON Launches KINOM Digital Entertainment Platform in Uzbekistan", Veon, October 2024
10. "VEON Launches AI-Powered Super App Hambi in Uzbekistan", Veon, November 2024

03

Mobile industry impact

The mobile industry is significantly advancing the UN Sustainable Development Goals (SDGs) and making notable strides as a transformative sector. Mobile technologies have consistently made contributions toward achieving the SDGs, demonstrating their potential to uplift and transform communities worldwide, as outlined in a GSMA report.[11] Mobile internet access is critical for connecting individuals to essential services such as healthcare, education and financial solutions. In Eurasia, operators are continuing in their efforts to improve access to these services, along with bridging the digital divide and ensuring a safe and secure online environment for all.

The rapid expansion of digital technologies, particularly mobile connectivity, has necessitated the promotion of digital literacy to ensure inclusiveness and to build awareness of a safe and secure online environment. Operators in the region are actively advancing digital literacy by supporting professionals such as teachers in understanding the impact of new technologies, assisting parents and children with awareness-building initiatives and aiding young people in skill development. Furthermore, they are incorporating sustainability methods and using connectivity for the greater good. Some examples of operator initiatives in Eurasia are listed in Table 2.

11. 2024 Mobile Industry Impact Report: Sustainable Development Goals, GSMA, 2024

Table 2

Examples of operators supporting digital literacy and helpline programmes

Area of impact	Country	Operator support
Digital literacy	Azerbaijan	Azercell is working to improve digital literacy throughout Azerbaijan with its 'Safe Internet' project. In the current phase of the project, aimed at promoting safe online practices among children, approximately 700 schoolchildren and 100 parents received specialised training. The programme addressed topics such as recognising and verifying online contacts, protecting personal data on social media, identifying online scams and understanding risks such as trolling and cyberbullying.[12]
	Belarus	A1 and the UNFPA launched a joint digital literacy programme for older people, presenting a beginner's guidebook to mobile technologies, in 2024.[13] In addition, A1's digital volunteers' network, called #ionline, will use this guidebook when assisting older people to start their digital journey.
	Uzbekistan	Beeline provided training for 100 teachers in AI and cyber hygiene as part of a digital education initiative. IT teachers from public and private schools in Tashkent completed advanced courses on 'Applications of Neural Networks and Artificial Intelligence' and 'Cybersecurity and Cyber Hygiene'. The educational programme was conducted at the Tashkent International University of Education.[14]
Supporting woman in distress	Azerbaijan	Azercell's Women's Support Line (WSL) received 1,623 applications in 2024. WSL responded to the applications to provide initial psychological assistance, organised individual meetings with women where necessary or directed the request to the relevant institutions. The main goal of WSL is to provide psychological, legal, social and emotional support to women in need of assistance and to help with their rehabilitation and integration into society.[15]
Promoting early childhood development and youth employment	Tajikistan	Tcell and Unicef signed a memorandum of understanding to promote safer internet access. The partnership aims to enhance parental support and promote youth employment opportunities across Tajikistan. Tcell will support access to the Bebbo positive parenting app, which provides guidance for parents with children under six on topics such as child health, immunisation and early childhood development. Additionally, Tcell will aid in enhancing the IT capacity of remote job centres. This collaboration aligns with Unicef's mission to promote early childhood development and support young people's successful entry into the workforce.
Sustainability-linked bonds for rural infrastructure	Armenia	In 2024, Team Telecom Armenia issued sustainability-linked bonds to finance the expansion of its 4G and high-speed fibre optic networks. The issuance of these bonds will enable critical upgrades to mobile and broadband infrastructure across Armenia, thereby enhancing internet speeds, coverage and reliability, particularly in underserved urban and rural areas. The proceeds from the bonds will support operator initiatives to modernise the national network and introduce a gender-inclusive approach in services to address the unique needs of female users in Armenia.[16] The initiative reflects the operator's efforts in integrating environmental, social and governance principles in its investments and ensuring that the development aligns with sustainability goals.

12. "Azercell's cybersecurity training reaches 800 children and parents", AzerNews, February 2025
13. "UNFPA and A1 Belarus launched new joint digital literacy program for older people", UNFPA, June 2021
14. "Beeline Uzbekistan Helped 100 Teachers Master AI and Cyber Hygiene", Beeline, December 2024
15. "'Women's Support Line' announces its 2024 report", AzerNews, February 2025
16. "ADB Supports Team Telecom Armenia's First Sustainability-Linked Bond to Strengthen Digital Infrastructure and Reduce Emissions", Asian Development Bank, December 2024

04

Mobile industry enablers

Continued growth and innovation across Eurasia will depend on clarity on spectrum availability in the short and long terms, with roadmaps for low-, mid- and high-band spectrum. More spectrum is needed for increased capacity and faster networks.

Roadmaps are an integral part of any successful strategy for licensing spectrum. In particular, they should:

- audit current spectrum use
- schedule future spectrum releases
- detail how spectrum will be assigned, including a framework for determining spectrum prices and other terms and conditions
- give the timing and process for spectrum renewal decisions
- plan for the introduction of technology-neutral licensing, sharing, leasing and trading.

Licensing regimes can create a positive policy environment to encourage network development and quality. Regulatory certainty supports robust long-term investment, and mobile has the best chance to support economic growth if licences are assigned and renewed in a way that fosters growth.

Low bands are crucial to close the digital divide. Due to its propagation characteristics, sub-1 GHz spectrum is essential to build coverage in sparsely populated areas and provide indoor coverage in built-up areas. However, with the uptake of digital services, additional spectrum is required to provide capacity in rural areas, where densification of cell sites and usage of high bands are economically impractical. Additional low-band spectrum will help connect rural areas to better-quality services by reducing the number of cell sites needed to reach the same level of performance. Most of the countries in Eurasia have not yet made available the 700 MHz band for mobile services. Examples of countries where this spectrum has been assigned to operators include Armenia and Uzbekistan. To extend coverage and capacity in rural areas, it is necessary to finalise already ongoing processes of cross-border coordination and move forward with the 700 MHz band migration.

Mid-bands, such as the 3.5 GHz range (3.3–3.8 GHz) and the 6 GHz band, can play an important role in closing the digital divide. The use of 5G technology, together with wide channels, could provide FWA services with fibre-like speeds in regions where fibre to the home (FTTH) is not practical. With proper network planning, one base station could provide FWA coverage for a small town. To meet the demand of citizens and businesses across Eurasia, more spectrum is needed. On average, 2 GHz of mid-band spectrum per market will be needed by 2030.

The ITU's WRC-23 opened the doors to a new era of connectivity and laid the spectrum foundations for mobile to progress into 5G-Advanced and 6G. Importantly, WRC-23 identified 6 GHz (6.425–7.125 GHz) for mobile use by countries in Europe, the Middle East, Africa, CIS, the Americas and Asia Pacific, and conditions for its use have been agreed in the ITU's Radio Regulations.

6 GHz spectrum will form a critical part of sustainable communications development. The enhanced mobile connectivity enabled by the band in wide-area, macro-cell networks will lay the foundations for inclusive and technology-driven progress in Eurasia and form a vital element of the region's digital ambitions.

5G equipment using 6 GHz has already undergone trials in countries across the world, reaching peak speeds of 12 Gbps, while the first prototype handset using 6 GHz was tested in late 2023. This marks a huge upward curve in technology development over the five years since the first consideration of the band for mobile services for 5G and beyond.

With that and the progress at WRC-23 in mind, the emphasis now is on governments and the industry to work together and deliver the full commercialisation of 6 GHz for mobile. The band should be included in spectrum roadmaps so that the mobile industry has clarity on the investment path that will be required for this frequency range.

Considerations for coverage obligations

Maximising revenue from spectrum auctions, rather than looking at long-term network development, can slow network rollouts, reduce network quality and lead to poorer mobile coverage. Over the past years, licensing processes that use a combination of obligations and lower spectrum costs have been used by governments as a mechanism to help improve network quality, especially in rural areas.[17]

These approaches include offering spectrum for a very low cost or for free when licences are due for renewal; reductions in annual fees; or reimbursements of a fixed amount of upfront costs in return for coverage commitments in designated areas. Importantly, governments recognise the difficulty in providing coverage, or upgrading networks, in specific geographic areas where the economics of mobile service delivery are most challenging.

Coverage obligations can affect rollouts in both positive and negative ways. Unrealistic or erroneously formulated obligations could divert investment from areas where it is needed. Therefore, a thorough analysis on how to use coverage obligations is required before any spectrum award. A percentage of population to be covered is used by some countries, but the impact of such obligations is difficult to assess in advance of a spectrum award, which may lead to unrealistic requirements. Due to such risks, many countries consider obligations stipulated as a number of base stations to be deployed.

In many cases, coverage obligations are combined with smaller spectrum prices or other discounts to compensate for more capital-intensive rollouts. For example, in Kazakhstan, the government has offered operators a 90% discount on spectrum fees for investing in rural coverage for the period 2021–2025 as part of the Digital Kazakhstan initiative. Such initiatives should be sustained until the digital divide has been successfully tackled. The government of Kazakhstan should also consider direct funding or state intervention measures to address other critical areas around infrastructure rollout in rural areas.

In Eurasia, special attention should be paid to the availability of backhaul and electric facilities, the lack of which in many cases limits achievable coverage in rural areas. This requires separate initiatives from governments and stakeholders to fund such infrastructure in rural areas.

17. “A delicate balance: spectrum and pricing obligations”, GSMA, March 2025

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