GSMA™

The Mobile Economy Asia Pacific 2025

GSMA

The GSMA is a global organisation unifying the mobile ecosystem to discover, develop and deliver innovation foundational to positive business environments and societal change. Our vision is to unlock the full power of connectivity so that people, industry and society thrive. Representing mobile operators and organisations across the mobile ecosystem and adjacent industries, the GSMA delivers for its members across three broad pillars: Connectivity for Good, Industry Services and Solutions, and Outreach. This activity includes advancing policy, tackling today's biggest societal challenges, underpinning the technology and interoperability that make mobile work, and providing the world's largest platform to convene the mobile ecosystem at the MWC and M360 series of events.

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Executive summary

Mobile connectivity supports efforts to develop modern, inclusive and sustainable digital nations in Asia Pacific,[1] and helps to integrate transformative technologies such as AI into daily activities for individuals and businesses. Additionally, the mobile ecosystem has become a significant contributor to the region's economy, helping countries mitigate the impacts of shifting demographics and global supply-chain disruptions to productivity. In 2024, the mobile sector accounted for 5.6% of GDP in Asia Pacific, contributing $950 billion in value. This is expected to rise to around $1.4 trillion by 2030, equivalent to 6.6% of GDP, as the impacts of 5G and its ecosystem become more widespread across local economies. To fully unlock this potential, it is crucial that stakeholders across the region's digital ecosystem foster trust and ensure the sustainability of the industry.

1.   Asia Pacific in this report excludes Greater China unless otherwise stated.

Key priorities for the digital ecosystem in Asia Pacific

5G monetisation

From 2019 to 2024, Asia Pacific operators invested $220 billion in network infrastructure, primarily for 5G. After peaking in 2023, capex-to-revenue ratios have stabilised as operators reduced spending after reaching significant 5G coverage. The focus now shifts to monetising 5G, with operators adopting innovative strategies to derive greater value from 5G services for consumers and enterprises. This is essential for the mobile industry's sustainability in Asia Pacific.

Addressing the scam economy

The volume and value of financial losses from online scams have increased, leading to what has been referred to as the 'scam economy'. Open APIs, through the GSMA Open Gateway initiative, have become a significant tool for operators, with six out of the nine APIs already announced in Asia Pacific providing solutions to address scams. This supports the increasingly collaborative approach taken by stakeholders to tackle scams, allowing them to share resources and expertise to manage evolving threats.

Mitigating cybersecurity threats

Asia Pacific has become a focal point for cyberthreats due to its status as a global technology and economic hub and the increasing digitalisation of local economies. The rollout of 5G and the proliferation of IoT devices have expanded the attack surface for mobile operators, necessitating the mitigation of vulnerabilities to prevent significant repercussions such as data breaches and widespread operational disruptions.

Bridging the investment gap

Mobile operators in the Asia Pacific region are expected to invest over $200 billion in capex by the end of the decade. However, this amount is not sufficient to build the infrastructure required for a digital future. Addressing this investment gap involves various strategies by stakeholders, including fiscal incentives, targeted funding, regulatory reforms and industry partnerships.

Balancing innovation and regulation

Innovation rates within the digital ecosystem are notably high, with new technologies emerging approximately every two to three years. However, innovation comes with responsibilities such as ensuring equitable access and consumer protection. In this context, a key objective of regulatory policy should be to support innovation within the digital ecosystem while considering these responsibilities.

Effective spectrum policy

The cost of spectrum has a significant impact on industry sustainability. A GSMA study found that the spectrum cost-to-revenue ratios in Asia Pacific markets have risen significantly over the last 10 years – from 3% in 2014 to 9% in 2023. To support continued investments in network infrastructure and related innovation, there is a need for clarity on spectrum availability, with roadmaps for low-, mid- and high-band spectrum and new pricing and licensing approaches to ease the financial pressure on operators.

The Mobile Economy Asia Pacific

Mobile's contribution to GDP

2024 **$950bn**
→ **5.6%** of GDP

2030 **$1.4tn**
→ **6.6%** of GDP

Employment

2024 **11 million**

jobs directly supported by the mobile ecosystem

Plus 5 million indirect jobs

4G (percentage of connections)

70% 2024

48% 2030

Excluding licensed cellular IoT

5G (percentage of connections)

18% 2024

50% 2030

Excluding licensed cellular IoT

Public funding

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

2024 **$90bn**

Operator revenues and investment

Revenues

2024 **$191bn**

2030 **$228bn**

Investment
Operator capex for the period 2024–2030

$254bn

2024 —————— 2030

Mobile internet users

2024 **1.5bn**
→ **52%** of the population

2030 **1.8bn**
→ **60%** of the population

01

The economic impact of mobile

1.1
Macroeconomic outlook

In the years following the Covid-19 pandemic Asia Pacific has shown robust growth, outperforming the global economy. One of the factors that contributed to this performance was the surging demand for semiconductors and electronics in emerging Asia, driven by significant investments in AI across the region. However, this growth has slowed down in tandem with the global economy, reflecting the impact of political instability, conflicts, production disruptions and high inflation during the last four years.[2]

The Asia Pacific economy is well positioned for steady economic growth. In 2024, GDP growth in the region stood at 4.1%, slightly below the pre-pandemic average of 4.3% during 2016–2019. The region has consistently achieved higher growth rates than the global average since 2022 (see Figure 1). In 2024, the countries in Asia Pacific with the highest GDP growth were Samoa (9.4%), Palau (7.2%), Vietnam (7.1%) and India (6.5%). A common theme among these countries in recent years has been a strong focus on leveraging digital technologies to drive economic growth and social inclusion.

There are some factors that can hinder progress: the region faces challenges such as an ageing population, potentially heightened trade barriers and an emerging pattern of declining productivity growth.[3] Despite this, the mobile sector has the potential to boost the economy by providing fast and reliable connectivity to support the development of the digital economy. This will drive efficiency and increase productivity for consumers and enterprises across all economic sectors by utilising the latest wave of digital technologies, including 5G, IoT and AI.

Figure 1
Real GDP growth in Asia Pacific and globally

Asia Pacific ▬
World ▬
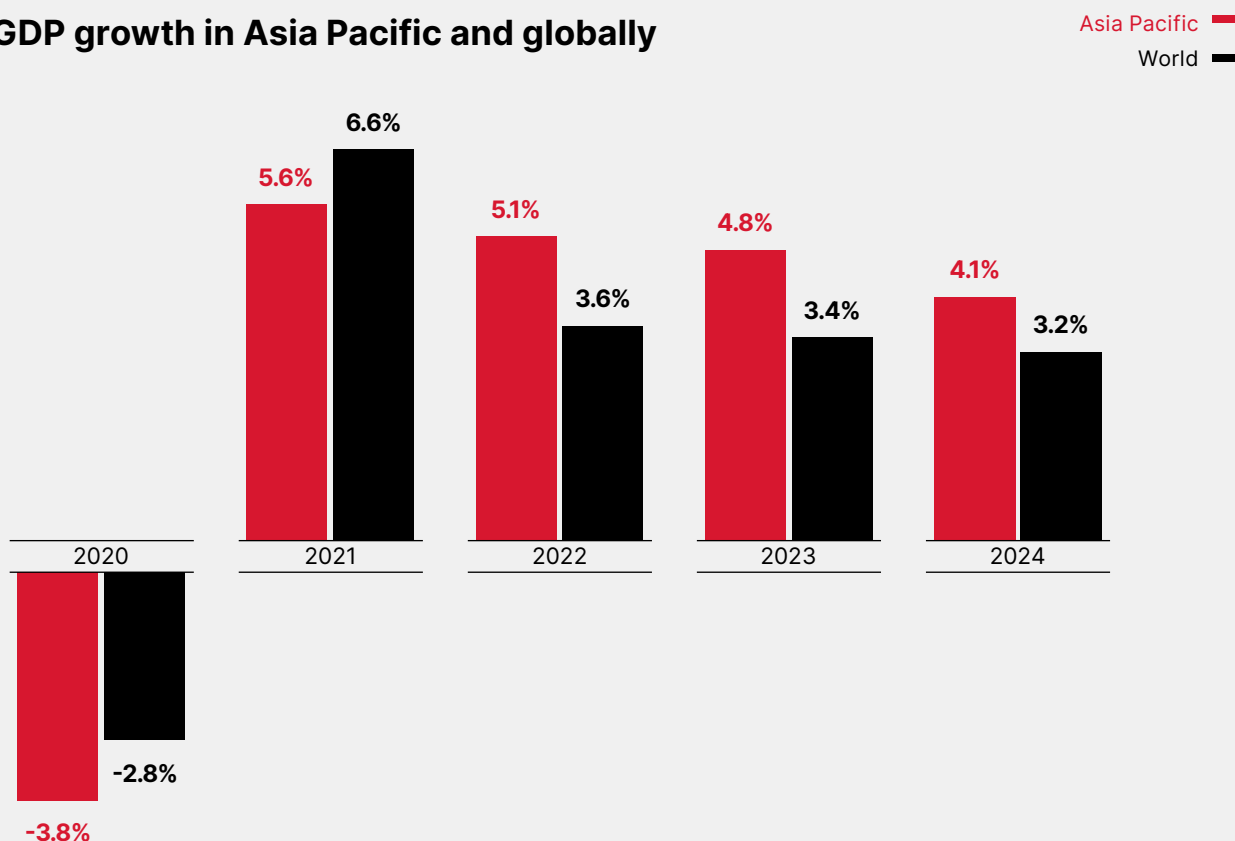
Source: GSMA Intelligence, using WEO-IMF April 2025 data

2. A Critical Juncture Amid Policy Shifts, International Monetary Fund, April 2025
3. "Asia Can Boost Economic Resilience Amid Surging Trade Tensions", IMF Blog, April 2025
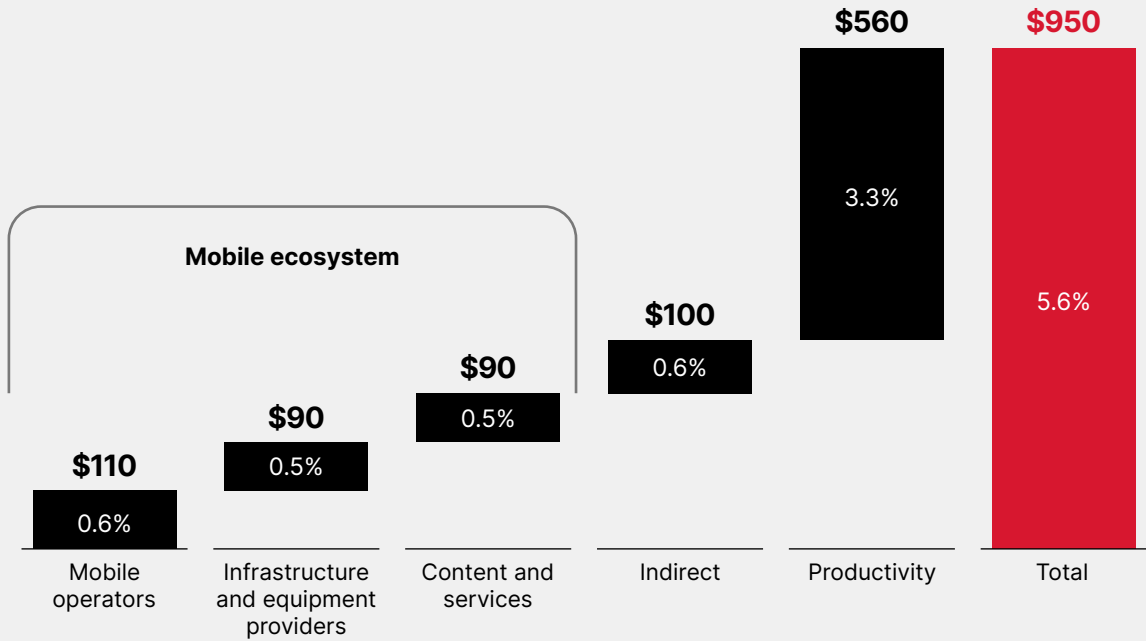
1.2
Mobile's contribution to the economy[4]

Mobile technologies contributed $950 billion in economic value to Asia Pacific in 2024

In 2024, mobile technologies and services[5] accounted for 5.6% of GDP across the Asia Pacific region, contributing $950 billion in economic value added. The most significant benefits arose from productivity effects, which amounted to $560 billion, followed by direct contributions, which contributed $290 billion. This growth was largely driven by the adoption of 5G technology, particularly in countries such as Malaysia and India, which experienced notable 5G coverage expansion.

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

Figure 2

Asia Pacific: total economic contribution of mobile, 2024

Billion

$110	$90	$90	$100	$560	**$950**
0.6%	0.5%	0.5%	0.6%	3.3%	5.6%
Mobile operators	Infrastructure and equipment providers	Content and services	Indirect	Productivity	Total

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

Mobile's economic contribution in Asia Pacific will reach almost $1.4 trillion in 2030

By 2030, mobile's contribution in Asia Pacific is projected to reach approximately $1.4 trillion, or 6.6% of GDP, driven by productivity improvements and efficiency gains resulting from the ongoing expansion of mobile services and the increasing adoption of digital technologies, including 5G, IoT and AI. Between 2025 and 2030 the mobile sector in the region is expected to grow at a CAGR of 6.5%, surpassing the regional GDP growth forecast of around 4%.[6] Consequently, it will play a key role in enhancing productivity in the region, which has been highlighted as a critical factor in addressing slower growth trends in recent years.

Figure 3

Asia Pacific: forecast of the economic impact of mobile

Billion
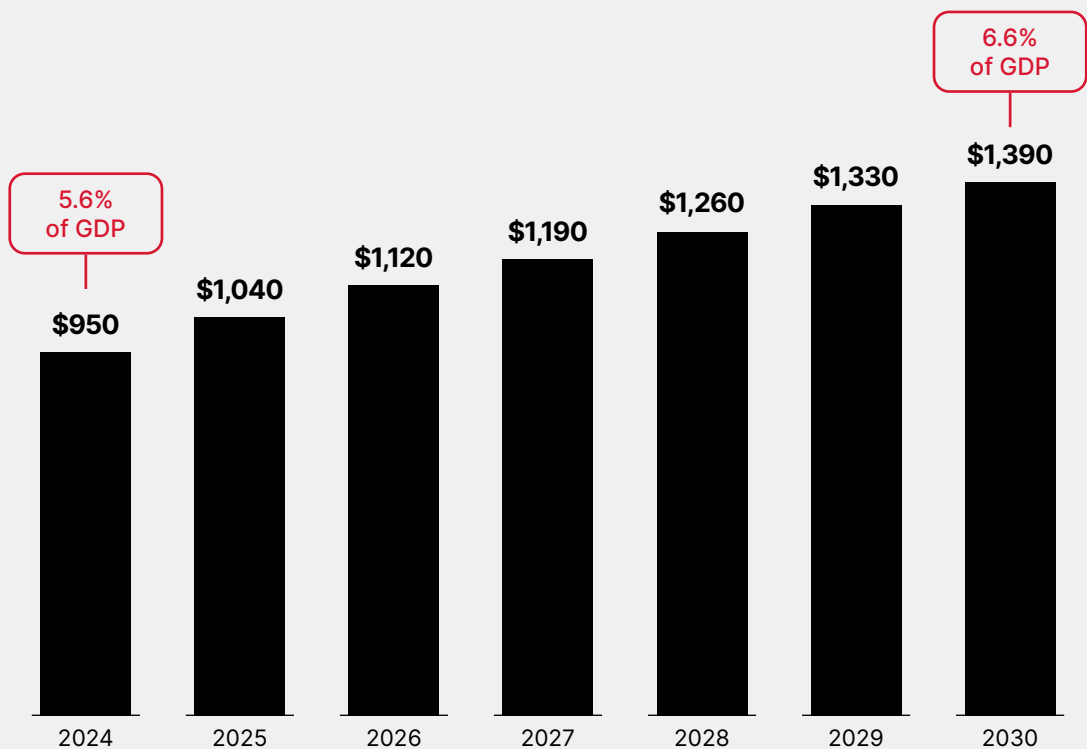
Source: GSMA Intelligence

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6.   According to the IMF, the real GDP growth in Asia will be 3.9% and 4.0% in 2025 and 2026, respectively (for more details, see Regional Economic Outlook for Asia and Pacific, International Monetary Fund, April 2025).

The mobile ecosystem supported 16 million jobs in Asia Pacific in 2024

Mobile operators and the wider mobile ecosystem provided direct employment to approximately 11 million individuals in Asia Pacific in 2024. Additionally, economic activity within the ecosystem supported around 5 million jobs in other sectors, resulting in a total of approximately 16 million jobs directly or indirectly supported.

Figure 4

Asia Pacific: employment impact of mobile, 2024

Jobs (million)

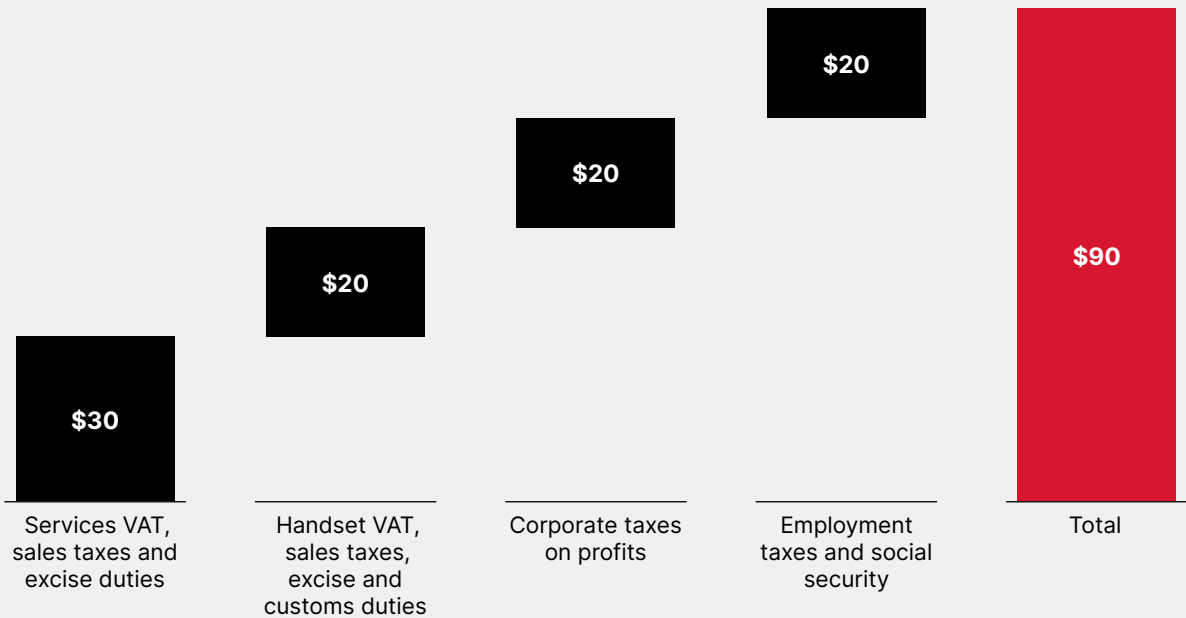| Direct	Indirect	Total
11	5	16

Source: GSMA Intelligence

The fiscal contribution of the mobile ecosystem in Asia Pacific reached $90 billion in 2024

The total tax revenue in Asia Pacific reached $3.1 trillion in 2024, representing an increase of 3% compared to the previous year.[7] In 2024, the mobile sector in Asia Pacific made a substantial contribution to public sector funding, raising $90 billion through taxes. A significant portion of this was derived from services VAT, sales taxes and excise duties ($30 billion). In 2024, the fiscal contribution of the mobile ecosystem accounted for 3.2% of the total tax revenue in the region.

Beyond its direct contribution, the mobile sector can enable more efficient tax revenue collection by enhancing tax processes across the economy. One channel for achieving this is through digital payments and mobile money, which is particularly relevant in developing countries within Asia Pacific, where large segments of the economy are informal. Another method involves leveraging mobile platforms for tax filing and payment. High compliance costs are a major barrier to tax payments by individuals and small-to-medium enterprises. In response, governments are rolling out mobile apps for filing and paying taxes to reduce friction and improve compliance rates.

Figure 5

Asia Pacific: fiscal contribution of mobile, 2024

Billion

$30	$20	$20	$20	$90
Services VAT, sales taxes and excise duties	Handset VAT, sales taxes, excise and customs duties	Corporate taxes on profits	Employment taxes and social security	Total

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

7.   Data obtained from the IMF Fiscal Policies: World Revenue Longitudinal Database

# 5G and its ecosystem will provide a significant boost to GDP in Asia Pacific by 2030

Mobile technologies and the ensuing digital transformation are expected to benefit the Asia Pacific economy by $1.4 trillion in 2030. This will be driven by the rapid adoption of advanced mobile technologies. In 2024, the countries with the highest 5G and IoT adoption were South Korea, Australia, Japan and Singapore. By 2030, however, 5G usage is expected to be widespread across most Asia Pacific countries.

Mobile technologies are expected to drive growth across all sectors of the Asia Pacific 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, 28% of the growth generated by mobile-enabled technologies is expected to originate in the manufacturing sector.

Figure 6

Asia Pacific: mobile's contribution to GDP by industry

Billion
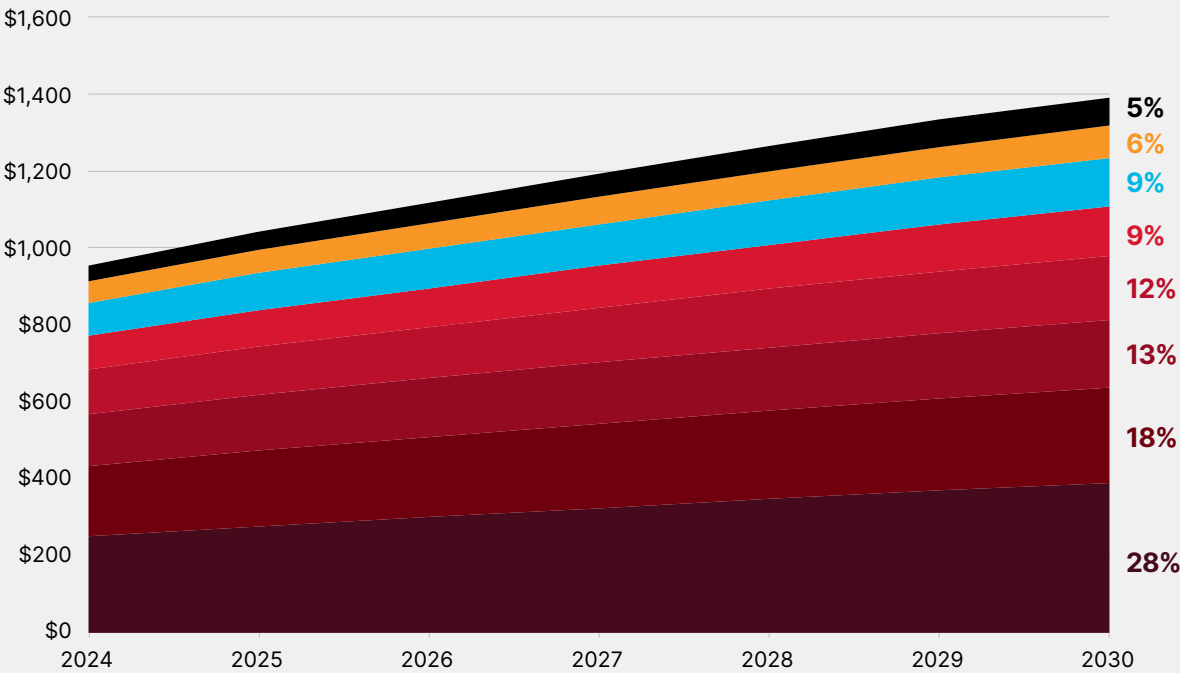
Source: GSMA Intelligence

02

Trends shaping the mobile industry

2.1
5G monetisation

Asia Pacific is home to some of the most advanced 5G markets globally. As of June 2025, there were 39 commercial 5G mobile networks across nine countries in the region,[8] including 17 commercial networks based on the 5G standalone (5G SA) architecture in nine countries. Additionally, 5G adoption has reached or is nearing mass-market levels in some countries, notably Australia, Japan, Singapore and South Korea – in each country, the technology is projected to account for more than half of total mobile connections by the end of 2025.

The region is also home to emerging 5G markets, such as Vietnam, where Viettel and VNPT launched commercial 5G services in late 2024 and reported over 5 million and 3 million 5G connections, respectively, by early 2025. The country's third operator, MobiFone, commenced its 5G services in March 2025. However, 5G remains a medium-term prospect in countries such as Sri Lanka, where Dialog completed its first voice over new radio (VoNR) trial on a live 5G network in April 2025, and a longer-term prospect in other countries, including Bangladesh and Pakistan.

5G capex peaks in pioneering markets

Operator investments in network infrastructure have been crucial for 5G development. From 2019 to 2024, operators in Asia Pacific allocated nearly $220 billion in capex, with the majority earmarked for 5G infrastructure deployment. This led to a peak capital intensity of 25%, on average, in 2023 among Asia Pacific markets that reached over 50% 5G coverage by June 2025 (see Figure 7). For instance, in July 2020, South Korea's three major

operators – SK Telecom, KT and LG Uplus – pledged a combined $22 billion over two years to enhance 5G infrastructure throughout the country. Similarly, in August 2022, Reliance Jio unveiled plans to invest $25 billion in a nationwide 5G rollout. Today, 5G coverage is universal in South Korea, while Jio's 5G SA network in India now serves over 60% of the population.

Figure 7

Asia Pacific: 5G coverage expansion led to record levels of capital intensity*

■ 5G coverage
■ Capex/revenue
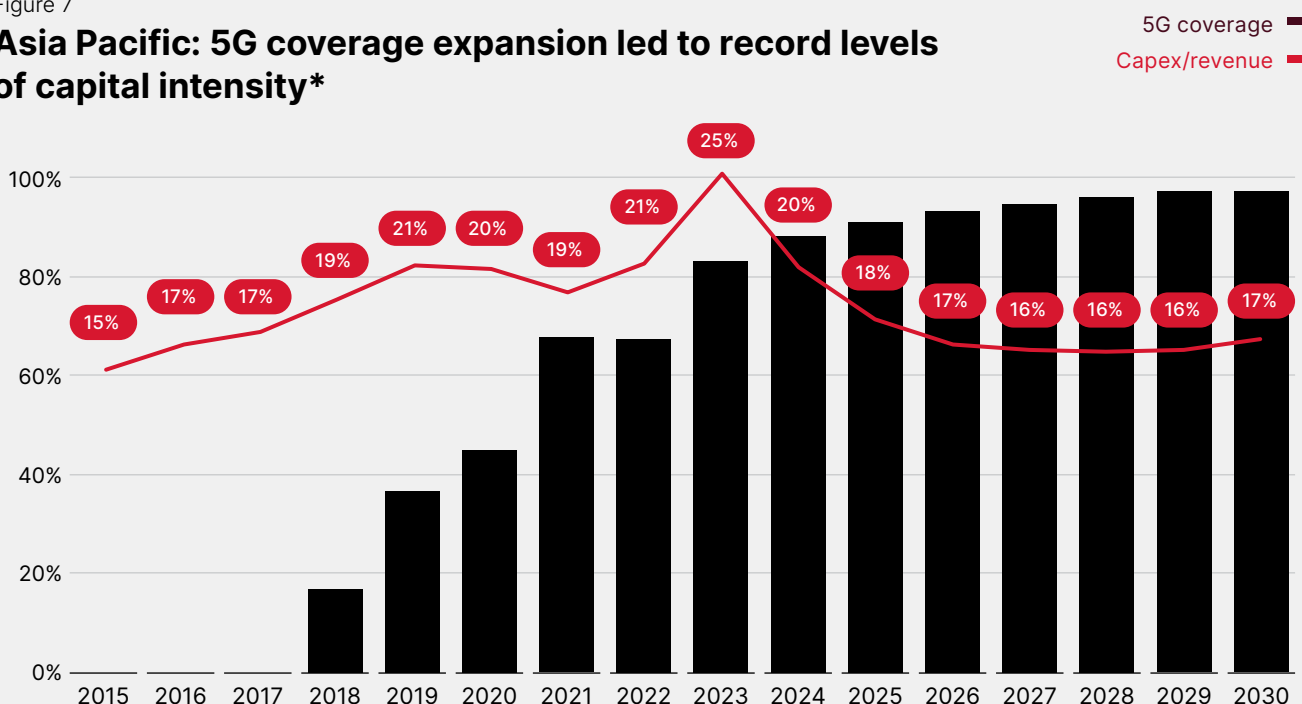
* Among markets that reached over 50% 5G coverage as of June 2025: Australia, India, Japan, Malaysia, Philippines, Singapore, South Korea and Thailand.
Source: GSMA Intelligence

8. Australia, India, Japan, Malaysia, Philippines, Singapore, South Korea, Thailand and Vietnam

Operators shift focus to 5G monetisation

Recent financial reports indicate that 5G capex is stabilising as operators scale down their spending after achieving significant 5G coverage. This trend is reflected in the 39% year-on-year revenue decline for equipment vendor Ericsson across Southeast Asia, Oceania and India in 2024,[9] primarily due to the normalisation of network investment levels following earlier rapid deployments. This development coincides with a growing shift in strategic focus from network deployment to monetisation, with operators seeking to recoup investments, maintain financial viability and support future innovation and technological advancements.

5G also entered the scene during a period of stagnant mobile revenue growth, driven by factors such as the commoditisation of voice and data services and intense price competition, particularly in markets such as India. The significant financial burden of 5G infrastructure investments, combined with shrinking core communication revenues, has made monetisation a central focus for industry leaders since the technology's launch. As such, various 5G monetisation strategies have emerged across Asia Pacific and in other regions over the years.

While some of these strategies can be broadly applied across most markets, the significant variations in macroeconomic, regulatory and technological environments often necessitate a tailored approach. For instance, mature markets such as Singapore and South Korea are advancing towards sophisticated 5G solutions, whereas emerging markets such as India and Indonesia face challenges such as low ARPU and high infrastructure costs. This underscores the need to adapt specific monetisation strategies, particularly those related to pricing and use cases, to fit the unique contexts of individual markets.

Enterprise 5G is at the forefront of monetisation strategies

Providing services to enterprises is not new for operators. A GSMA Intelligence study found that operators have seen faster growth on average in the enterprise segment than in the consumer segment, with demand expanding for solutions across a range of technology areas (e.g. cloud, edge, IoT and security).[10] 5G has created renewed interest in the enterprise segment, which is now viewed as essential for justifying the 5G business case. This interest is driven by factors such as the potential for premium pricing through tailored solutions, the application of the technology in mission-critical situations (e.g. smart factories and remote surgeries) that offer recurring revenue streams and 5G's role in facilitating digital transformation for public and private enterprises.

The deployment of 5G SA is an important enabler of 5G capabilities, such as for network slicing, and serves as a foundation to unlock 5G-Advanced's potential. Additionally, private 5G networks will underpin innovative use cases for enterprises across different verticals. Although private 5G activity is concentrated in the most advanced countries – such as Australia, Japan, South Korea and Singapore, due to higher levels of digitalisation across the public and private sectors – momentum is beginning to grow in other markets, including India, Indonesia and Thailand. These networks will play a crucial role in efforts to monetise 5G investments through enterprise solutions.

Some examples of operator activities in this area are highlighted below:

- **May 2025:** M1 introduced 5G RedCap services for enterprises in Singapore, using Nokia's 5G RedCap technology, to support a range of IoT devices and wearables.

- **May 2025:** Telkomsel and Pegatron partnered together to use 5G to support the implementation of AI and IoT-based solutions in a smart manufacturing facility in Batam, Indonesia.

- **May 2025:** Spark and Air New Zealand announced a private 5G network trial in New Zealand, supported by Ericsson, at Auckland Airport to automate warehouse stocktakes with real-time data and precision and to improve worker safety.

- **April 2025:** KDDI revealed a new network slicing solution for live event broadcasting in Japan, allowing it to dedicate a network slice for video transmission in crowded venues.

- **February 2025:** Globe Telecom disclosed that it is testing Nokia's Network Exposure Platform to provide enterprises with enhanced security via network APIs in the Philippines.

- **January 2025:** StarHub teamed up with Nokia on network APIs to drive 5G and 4G application development in enterprise verticals in Singapore.

9. Ericsson Annual Report 2024, Ericsson, 2025
10. The opportunity for operators in B2B technology services, GSMA Intelligence, 2024

Consumer interest in 5G offers monetisation opportunities

Although enhanced mobile broadband (eMBB) remains the main 5G use case in the consumer segment, demand and willingness to pay – two critical factors for 5G monetisation in the consumer segment – remain strong, according to insights from the GSMA Intelligence Consumers in Focus Survey 2025. Examples of 5G monetisation strategies in the consumer segment include the following:

- **5G bundling:** The GSMA Intelligence consumer survey reveals strong interest in 5G bundling, with 5G users showing a greater inclination than 4G users to add digital content such as video streaming, services (e.g. cloud storage) and devices (e.g. wearables) to their mobile contracts. Across Asia Pacific, 5G bundling is one of the most prominent monetisation strategies. For example, Singtel offers free subscriptions to services such as Bookful and MelodyVR for 5G customers on higher-tier plans in Singapore, while Optus includes add-ons such as free subscriptions to streaming services (e.g. Netflix) for 5G home broadband plans in Australia.

- **5G FWA:** Fixed wireless access (FWA) is another crucial 5G service with widespread deployment across Asia Pacific, including in countries with extensive fixed broadband infrastructure. As of June 2025, 26 of the 39 5G mobile service providers in the region also offered 5G FWA, reflecting strong confidence in its monetisation potential. In India, 70% of new Jio AirFiber connections come from underserved areas outside the top 1,000 towns by population and administrative status.[11] Additionally, Airtel recently awarded a contract to Nokia for the supply of outdoor gateway receivers and Wi-Fi 6 access points, using Qualcomm's modem-RF and Wi-Fi 6 chipsets, to enhance its 5G FWA offering.

- **Product innovation:** In addition to basic data services for smartphones and other connected devices, operators are creating specialised solutions that utilise 5G connectivity to address specific user requirements. For instance, in May 2025, AIS introduced AiCAM, a smart CCTV camera that combines 5G connectivity with AI to enhance home and community security. The camera's features reflect common household needs, with applications for indoor and outdoor security, elderly monitoring, child supervision and pet tracking. AIS offers three AiCAM models, with pricing starting at THB990 ($30). Cloud storage through an add-on package is available at THB99 ($3) per month.

- **Experience-driven pricing:** Operators are offering differentiated prices for tailored connectivity based on specific user needs rather than data volume. The examples below from AIS and Singtel highlight two variants of this monetisation strategy:

  - In Thailand, AIS implemented a pay-as-you-need add-on, called 5G Mode, in December 2023, offering its customers the flexibility to access premium connectivity for specific activities and during specific times, such as live content creation on social media platforms or online gaming sessions. In February 2025, AIS reported that the add-on had reached 180,000 users, with each purchase increasing monthly revenue per customer by approximately 22%.[12]

  - In February 2025, Singtel extended its 5G network slicing capabilities, which was previously reserved for enterprises, to consumers with the launch of '5G+'. While customers on higher-priced premium packages were automatically upgraded to the 5G+ network at no extra cost, those on lower-tier plans need to upgrade to a higher-tier plan to access the 5G+ benefits, which include up to four-times faster speeds, ultra-low latency, guaranteed network access (even in high-traffic areas such as stadia and public transport hubs) and additional cyberthreat protection.

- **Tariff increase:** Operators in low ARPU countries are considering simple tariff increases as a means to reverse the impact of intense price competition and bring revenues to sustainable levels. In India, Airtel and Jio increased the entry-level prices for 5G services by 6–10%. Historically, India has had some of the lowest mobile pricing, as operators relied on the economies of scale from rapid subscriber growth to remain profitable despite low ARPUs (under $3). The tariff increase has resulted in a rise in ARPUs, with credit rating agency ICRA Limited projecting a 12–14% year-on-year rise in operating revenues in FY2025, though ARPUs in India remain lower than those of many other countries in Asia Pacific.

11. "Reliance Jio's home broadband base 90% higher than Bharti Airtel's in Q3: CLSA", The Economic Times, March 2025
12. Success of AIS '5G Mode' Unveils Lucrative Revenue Streams for Mobile Operators", Mobile World Live, February 2025

2.2
The scam economy

Digital connectivity is an essential part of modern society, as it supports social and economic progress for individuals and communities. This highlights the importance of ongoing efforts to close the connectivity gap and extend digital services to underserved communities. However, the benefits of connectivity are increasingly being undermined by the activities of bad actors who exploit people's trust in digital services to perpetuate scams. Such actors are leveraging online anonymity to operate behind false identities, circumvent local law enforcement and target victims across geographical borders.

Online scams have grown in scale over time in terms of volume and the value of financial losses, resulting in what is now widely referred to as the 'scam economy'. According to the Global State of Scams 2024 report by the Global Anti-Scam Alliance (GASA), scammers siphoned more than $1.03 trillion worldwide over the past year,[13] with countries in Asia[14] accounting for a significant proportion of this.

For example, scam victims in Thailand lost around THB60 billion ($1.8 billion) in 2024,[15] while the figure in Japan is estimated to be JPY200 billion ($1.3 billion) for the same year.[16]

The expansion of the scam economy is influenced by various factors, particularly the rapid adaptation of techniques to exploit new vulnerabilities and advancements in technologies such as AI, which facilitate highly sophisticated attacks that are increasingly difficult to detect or counteract. This has considerable repercussions for victims, including individuals who suffer losses of personal information and financial assets due to scammers' activities and trafficked individuals who are forced to carry out scam farms, many of them located in countries across Southeast Asia.[17] A recent GSMA Intelligence report[18] underscores the impact of the scam economy on victims and other unwilling stakeholders within the scam economy.

13. Global State of Scams Report 2024, GASA, 2024
14. Including China
15. "Online Fraud Cost Thailand 60 Billion Baht in 2024", Report Reveals, The Nation, April 2025
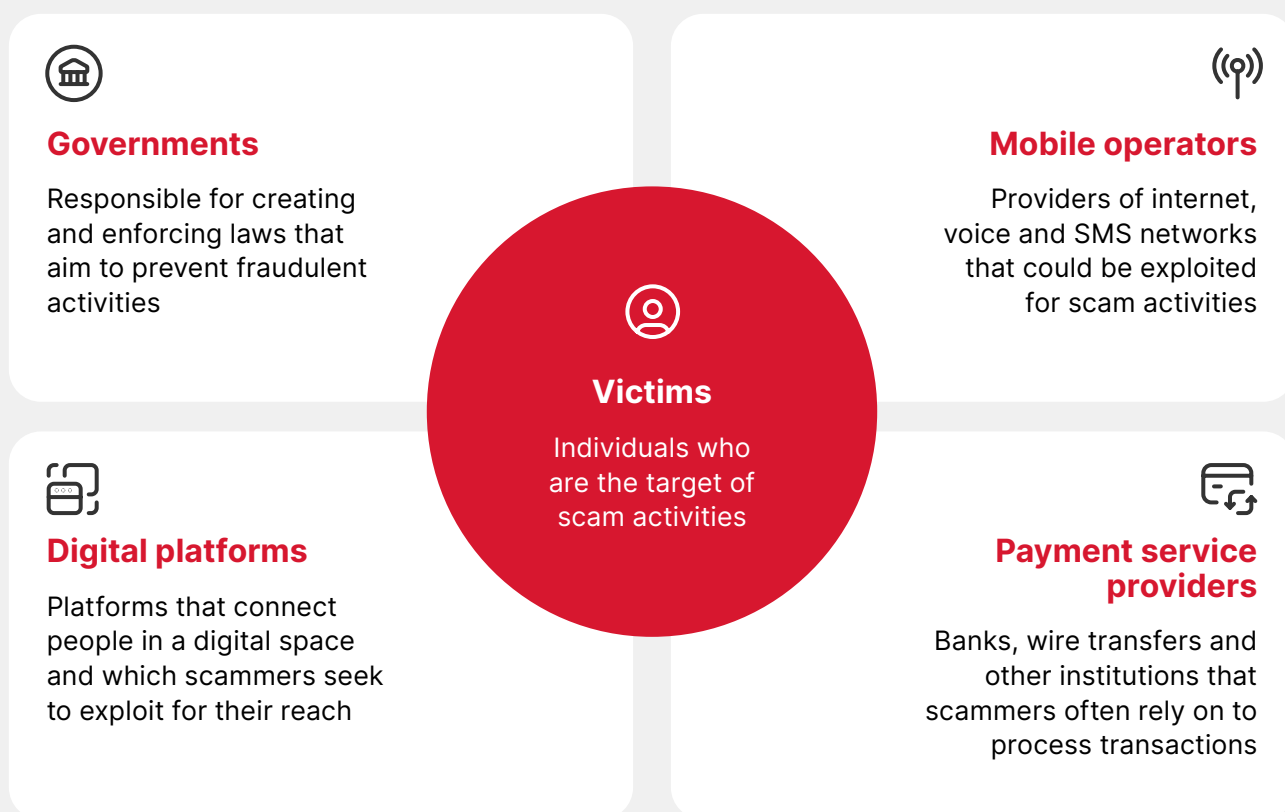16. "Record loss from fraud and social media scams reported in 2024", The Asahi Shimbun, February 2025
17. "Scam centres are a 'human rights crisis', independent experts warn", United Nations, May 2025
18. Towards a digital nation: addressing the scam economy in Asia Pacific, GSMA Intelligence, March 2025

Individuals and entities entangled in the scam economy

Governments
Responsible for creating and enforcing laws that aim to prevent fraudulent activities

Mobile operators
Providers of internet, voice and SMS networks that could be exploited for scam activities

Victims

Individuals who are the target of scam activities

Digital platforms
Platforms that connect people in a digital space and which scammers seek to exploit for their reach

Payment service providers
Banks, wire transfers and other institutions that scammers often rely on to process transactions

Source: GSMA Intelligence

Open APIs and AI underpin industry efforts to tackle the scam economy

Operators are key providers of digital connectivity, and their core services (e.g. voice and SMS), along with third-party digital platforms that operate on their networks, such as social media and e-commerce platforms, serve as primary channels through which scammers reach their victims. With nearly 5.8 billion mobile subscribers globally, including 4.7 billion mobile internet users, virtually every individual with a mobile subscription is a potential target for scam attacks. In South Korea, for example, the number of spam messages and calls reported or detected by the Korea Internet & Security Agency (KISA) from January to August 2024 reached 280.4 million, up 68% from the same period in 2023.[19]

Recognising the damaging effects of the scam economy on victims and the erosion of trust in digital services, operators and industry stakeholders are increasingly introducing innovative strategies to combat these threats and restore confidence in connectivity. These efforts are being implemented within legal obligations to safeguard user privacy and communication confidentiality, a scenario which sometimes restricts operators' ability to filter or block network traffic without potentially interrupting legitimate activities.

The GSMA Open Gateway initiative,[20] which aims to harness the capabilities of mobile networks worldwide by providing access through standardised APIs, is an example of an industry-wide initiative supporting efforts to tackle scams. There are now 21 APIs in operation, 10 of which address anti-fraud use cases. As of June 2025, 23 operators in 12 markets across Asia Pacific had launched or committed to the Open Gateway initiative, with six out of the 11 APIs already announced in the region offering solutions to tackle scams: SIM Swap, Device Location Verification, OTP Validation, Device Swap, Number Verification and KYC Match.

19. "Mobile phone spam hits record high through August", Yonhap News Agency, September 2024
20. https://open-gateway.gsma.com

Operators in Cambodia and Vietnam have recently committed to using open APIs to tackle scams. In March 2025, Cambodian operators Cellcard, Smart Axiata and Metfone announced a collaboration under the Open Gateway initiative to enhance digital security, combat fraud, enhance identify verification and foster seamless integration of digital services across networks. Vietnamese operators MobiFone, Viettel and VNPT also announced similar collaborations in April 2025. Operators in several other countries in the region, including India, Indonesia, the Philippines and Sri Lanka, have commercially deployed open APIs, such as Device Location Verification, Number Verification and SIM Swap, highlighting the growing momentum towards leveraging the Open Gateway initiative to foster more secure and innovative digital ecosystems.

In addition to leveraging open APIs, operators and other industry participants are using AI to bolster the effectiveness of anti-scam solutions. This has become imperative given the increasing scale and sophistication of scam attacks, many of which are unfortunately facilitated by AI. Consequently, operators face the challenge of staying ahead of bad actors through innovation in AI and other emerging technologies that significantly impact the scam economy.

For instance, in Singapore, Singtel upgraded its ScamShield app in 2024 to leverage AI for identifying scams across multiple platforms. Meanwhile, in South Korea, SK Telecom developed an AI-driven anomaly detection service that integrates communication and financial data. This service evaluates customers' exposure to voice phishing and their risk levels in real time. It also enables proactive measures such as blocking suspicious transfers and withdrawals.

Operator case study: Airtel implements an AI-powered, multi-tiered anti-scam solution

Airtel has implemented an anti-scam strategy to protect customers and maintain trust in digital services in India. In September 2024, the company introduced a network-based, AI-powered spam detection solution to notify customers in real time about suspected spam calls and SMS messages. Within three months, the solution had alerted around 252 million unique customers to roughly 8 billion spam calls and 800 million spam SMS messages.[21] By April 2025, Airtel had upgraded the solution to include alerts for spam calls and SMS messages from both domestic and international numbers in 10 Indian languages (Hindi, Marathi, Bengali, Gujarati, Tamil, Kannada, Malayalam, Urdu, Punjabi and Telugu).

In May 2025, Airtel launched a new solution designed to detect and block malicious websites across various communication platforms, including over-the-top (OTT) apps, emails, browsers and social media platforms, in real time. These enhancements reflect an effort to address the scam economy and demonstrate a commitment to investing in the technology and skills necessary to defend against current and emerging threats.

21. "Airtel releases spam report that analyses the trends observed on its network since the launch of its spam solution", Airtel, December 2024

The need for ecosystem-wide collaboration to combat scams

The fight against scams is fundamentally a collaborative effort. Consumers expect a secure digital experience, and the reputation of operators, payment service providers and digital platforms hinges on their ability to provide this. In recent years there has been an increase in collaborative efforts among operators and other stakeholders in the wider ecosystem, such as the below:

- **May 2025:** Airtel proposed a joint industry initiative with other operators, including Jio and Vi, to address various online scams using AI-powered tools and real-time intelligence sharing for detection, prevention and mitigation across networks.

- **November 2024:** The Korea Communications Commission and KISA developed AI-powered spam-blocking technology designed to detect and block suspicious messages on smartphones.

The technology was created in collaboration with Samsung, which began implementing it on devices starting with the Samsung Galaxy S25. Authorities reported a nearly 30% decrease in the number of spam messages received and reported in the second half of 2024 overall compared to the first half of the year, which they attribute to the implementation of this solution.[22]

By adopting a collaborative approach, stakeholders can pool their resources and expertise to stay ahead of evolving threats. Collaboration can take various forms, such as real-time intelligence sharing, cross-network coordination and joint efforts to raise awareness and develop anti-scam solutions. These partnerships serve not only as defensive measures but also present opportunities to build trust, enhance customer loyalty and demonstrate a commitment to protecting the digital ecosystem.

GSMA APAC Cross-sector Anti-scam Taskforce

The GSMA APAC Cross-sector Anti-scam Taskforce (ACAST) is a GSMA-led initiative focused on combatting scams across Asia Pacific. The regional initiative brings together stakeholders among mobile operators and digital platform providers to foster cross-sector collaboration and share best practices in scam prevention. As scams continue to evolve in scale and sophistication, initiatives such as ACAST play a critical role in supporting a safer and more resilient digital economy across Asia Pacific.

22. "The Korea Communications Commission announces the results of its first half survey. An average of 16 spam calls per person per month It's the highest number ever. The percentage of overseas shipments increased to 26%.", Maeil Business Newspaper, December 2024

2.3
Cybersecurity threats

Asia Pacific plays a crucial role in global supply chains and has established itself as a hub for technology and economic activities. As digitalisation continues to spread rapidly across public and private institutions, including small businesses, the region has become a focal point for cyberthreats. According to the IBM X-Force 2025 Threat Intelligence Index, Asia Pacific experienced 34% of global cybersecurity incidents in 2024, the highest proportion worldwide.

In this context, the region's connectivity infrastructure – particularly mobile networks – has emerged as both a target for attacks and a vector to compromise other critical infrastructure, government institutions and enterprises across various sectors such as healthcare, financial services, retail and transportation. The scope of threats that operators face varies and is evolving continuously, with phishing/smishing and ransomware attacks perceived to be the most prevalent, according to a GSMA Intelligence study (see Figure 9). There are also more nuanced attempts such as 'living off the land'[23] or 'lone wolf'[24] attacks.
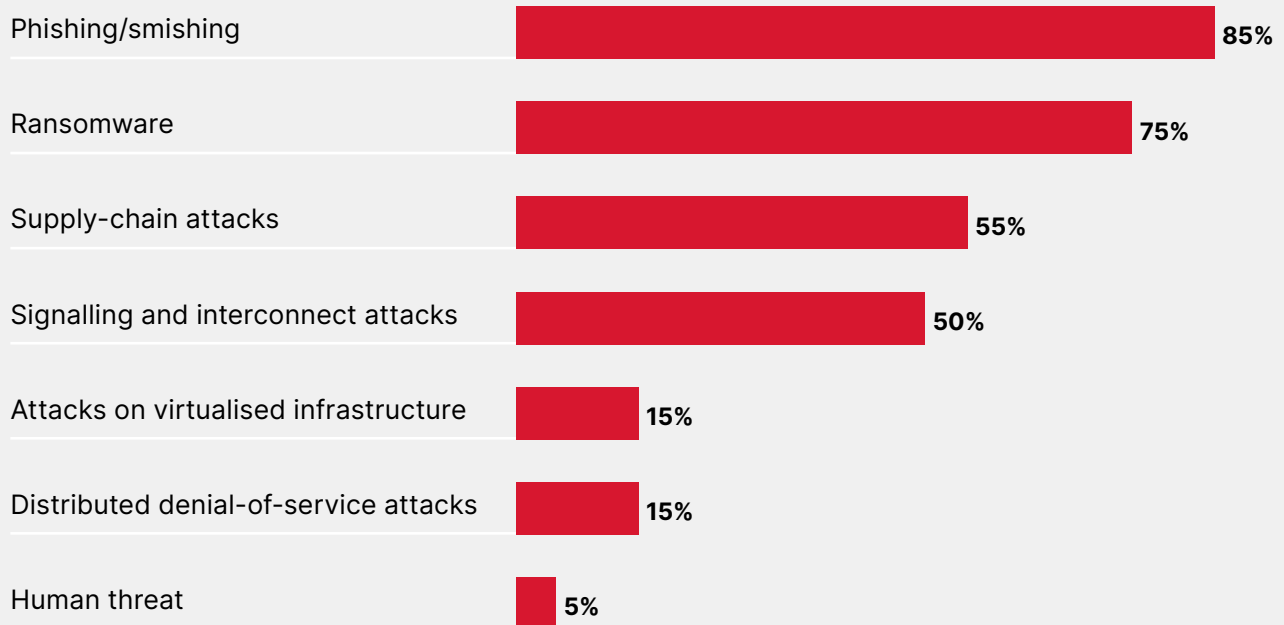
23. Where a cybercriminal uses native, legitimate tools within the victim's system to sustain and advance an attack
24. An attack by an individual with help or encouragement from an organisation

Figure 9

Phishing/smishing, ransomware and supply-chain attacks are the top three threats impacting mobile networks in Asia Pacific

Rank the top three major threats impacting mobile networks in your primary country of operation (Percentage of operators)

Phishing/smishing	85%
Ransomware	75%
Supply-chain attacks	55%
Signalling and interconnect attacks	50%
Attacks on virtualised infrastructure	15%
Distributed denial-of-service attacks	15%
Human threat	5%

Source: GSMA Intelligence

The following are examples of recent attacks in the region:

- **June 2025:** SoftBank disclosed a security incident, which occurred through an outsourced service provider, involving the potential exposure of personal information belonging to over 137,000 mobile subscribers.

- **April 2025:** SK Telecom disclosed that that it had been subject to a massive data breach that led to the leak of customer data.

- **June 2024:** Several Indonesian government offices were hit by cyberattacks, including a ransomware attack on the country's Temporary National Data Centre.

- **2021 to 2023:** Operators and government entities in Vietnam were targeted by the 'Stayin' Alive' espionage campaign, potentially compromising communications data.

- **September 2022:** Australian operator Optus experienced a significant data breach that exposed the personal information of around 10 million customers.

5G expands the attack surface

The rollout of 5G and the proliferation of IoT devices expand the attack surface for mobile operators. Compared to previous network generations, 5G networks have a wider attack surface due to the larger number of connected devices and denser network infrastructure. Additionally, its use of cloud technology, virtualisation and software-defined networking (SDN) creates new avenues for exploitation. That said, even with 5G's larger attack surface, the technology also includes enhanced security capabilities that are more advanced than those provided by earlier generations.

Below are some of the security risks associated with 5G:[25]

- **Cyberattacks:** 5G networks are exposed to various cyberthreats, including ransomware and distributed denial-of-service (DDoS) attacks. The higher data speeds and lower latency can provide opportunities for more sophisticated attacks.

- **Supply-chain vulnerabilities:** With 5G infrastructure being built by multiple vendors globally, the supply chain is complex and potentially more susceptible to security breaches. A compromised component within the supply chain could lead to widespread vulnerabilities, although supply-chain competition can drive innovation and improvements.

- **Privacy concerns:** The significant amount of data generated by 5G-connected devices raises privacy issues. Unauthorised access to sensitive information can have negative consequences for individuals and organisations.

- **IoT vulnerabilities:** The proliferation of IoT devices on 5G networks presents a challenge in securing these devices, as many devices may not yet have robust security features. Unsecured IoT devices create new vulnerabilities and serve as entry points for attacks.

Industry efforts to counter cybersecurity threats

Operators understand the critical need to secure their network infrastructure and safeguard customers against both existing and emerging cybersecurity threats. Addressing vulnerabilities is crucial to prevent potentially significant consequences, including data breaches, financial losses, reputational damage and widespread operational disruptions. Against this backdrop, operators across Asia Pacific have implemented various technical and non-technical measures to counter these threats. Some of these measures are highlighted below:

- **Zero-trust architecture:** Zero-trust architectures (ZTAs) involve employing robust access controls, network segmentation and AI-based anomaly detection to enhance security. It operates on the principle that no entity – internal or external – is inherently trustworthy, thereby reducing the risks associated with phishing and insider threats. Singtel has implemented zero-trust security models to safeguard its 5G network infrastructure, and in March 2025 it expanded its partnership with Palo Alto Networks to deliver AI-powered, zero-trust security aimed at protecting its customers. In October 2024, Airtel partnered together with Zscaler, a cloud security provider, to launch Airtel Secure Digital Internet, a fully managed ZTA-based solution designed to protect enterprises from a wide range of cyberthreats.

- **AI and machine-learning tools for threat detection:** AI tools enable operators to respond faster to threats, narrowing the window for attackers to exploit vulnerabilities. For example, Globe Telecom has implemented AI and machine-learning tools to enhance its cybersecurity. By partnering with Vectra AI, Globe deployed an AI-powered extended detection and response platform that uses advanced algorithms to quickly identify and respond to cyberthreats across its mobile network, significantly reducing the time attackers have to exploit vulnerabilities. As a result, Globe was able to reduce incident response time to just 3.5 hours, strengthening protection for over 80 million subscribers.

- **Enhancing supply-chain security:** This aims to mitigate risks from supply-chain attacks and address concerns about untrusted vendors. In Japan, NTT Docomo has bolstered its supply-chain security by conducting audits of its third-party vendors and adopting secure-by-design principles for 5G equipment. In Australia, Optus introduced mandatory cybersecurity audits for all suppliers in 2023 following a 2022 breach caused by a third-party vendor.

25. "Safeguarding the future: Managing 5G security risks", GSMA, October 2023

- **Cybersecurity training and awareness programmes:** By training employees and educating customers to recognise phishing/smishing attempts, operators can reduce human-related vulnerabilities. In India, Airtel has implemented mandatory cybersecurity training for its employees to equip them to handle cyberthreats effectively, collaborating with the Cyber Management Alliance.

- **Government collaborations with the industry:** Partnerships between governments and the telecoms industry play a crucial role in harmonising cybersecurity standards and strengthening the ability to detect and counter national threats. For example, in May 2025, AIS teamed up with the Office of the National Security Council, Royal Thai Police, Ministry of Digital Economy and Society, and the National Broadcasting and Telecommunications Commission, under the Secure Network Alliance initiative, to proactively counter cyberthreats. In Australia, Optus collaborates with the Australian Cyber Security Centre to share threat intelligence and adhere to global standards. In Japan, SoftBank partnered with the Ministry of Internal Affairs and Communications in 2023 to develop a national cybersecurity framework for telecommunications, focusing on protecting critical sectors such as automotive and manufacturing following the 2022 Kojima Industries cyberattack. And in the Philippines, operators PLDT, Smart, Globe and Dito Telecommunity, along with other stakeholders, have teamed up with the government and military forces to tackle cyberattacks, infrastructure theft and other security breaches.

- **Incident-response frameworks:** This outlines the processes operators use to detect, tackle and recover from cybersecurity incidents to minimise damage, restore normal operations and prevent future incidents. In the Philippines, Globe established a 24/7 cyberthreat response centre in 2023. Meanwhile, in Thailand, AIS implemented an automated incident-response system in 2024.

- **Regulatory compliance:** Some governments have imposed strict security and data protection obligations on operators, as critical infrastructure providers, to strengthen protections against cyberthreats. While many of these come with increased compliance costs, operators are taking steps to align with these laws. For instance, operators in Malaysia have aligned with the Personal Data Protection Act (PDPA), upgrading their data encryption protocols.

- **Regional collaboration:** Regional organisations such as the Association of Southeast Asian Nations (ASEAN) offer a platform for member states to exchange information on emerging and existing threats, implement confidence-building measures and build capacity to defend against existing and emerging cyberthreats. The first ASEAN cybersecurity strategy was implemented during 2017–2020, while the second covers 2021–2025. There have been many key achievements to date, including better coordination across ASEAN sectoral bodies overseeing cybersecurity, enhanced incident response and increased capacity building.

The GSMA Mobile Cybersecurity Knowledge Base

The GSMA Mobile Cybersecurity Knowledge Base[26] consists of documents detailing anti-fraud and security best practices and recommendations developed by professionals in operational networks and related products and services. It provides an overview of the threat landscape and aims to assist stakeholders – such as operators, equipment vendors, regulators, application developers and service providers – in understanding mobile network security threats in a systematic and objective manner.

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26. https://www.gsma.com/solutions-and-impact/technologies/security/cybersecurity-knowledge-base/

Other industry developments in Asia Pacific

Trend	Examples
Open RAN	JTOWER has introduced Japan's first open RAN–compatible shared 5G radio equipment for the sub-6 GHz frequency band. This allows operators to share antennas, repeaters and 5G radio equipment based on open RAN standards. Testing with all four operators will start in 2025. MobiFone has teamed up with Rakuten on a pilot project to jointly deploy a nationwide 4G and 5G open RAN mobile network in Vietnam. The pilot project will serve as a critical testbed, validating open RAN's commercial potential and addressing integration challenges.
Consolidation	XL Axiata and Smartfren Telecom merged in March 2025 in a transaction valued at $6.5 billion. The Indonesian mobile market has undergone significant consolidation over the past decade, with the number of operators decreasing from eight to three.
AI	KT and Viettel have signed a strategic partnership, valued at $95 million, to develop AI in Vietnam. The operators will focus on six core areas, including a national AI model, Vietnamese-language AI agents and solutions to combat voice phishing. Telkomsel is collaborating with US-based AI company Perplexity to bundle its AI-based search engine into data connectivity packages for B2B and B2C customers, with tailored data packages targeting students, researchers and micro, small and medium enterprises.
Satellite	Vodafone Idea and AST SpaceMobile have announced a strategic partnership to expand mobile connectivity across India's unconnected regions. While there is widespread 4G and emerging 5G coverage in India, AST SpaceMobile says the satellite service will complement terrestrial connectivity to further expand broadband cellular access in some challenging terrains. In New Zealand, 2degrees signed a deal with AST SpaceMobile to deliver broadband data service directly to smartphones using satellites in 2026.
IoT	Singtel is using virtual IoT network operator floLIVE to underpin its new global IoT proposition, which seeks to capitalise on new remote eSIM provisioning capabilities, notably for automotive suppliers. Singtel expects the solution to allow it to become a 'single access point' for IoT connectivity in around 190 markets around the world.
Regulations	Vietnam has implemented extensive reforms in the telecoms sector, streamlining administrative procedures and delegating licensing authority to provincial People's Committees. This change aims to accelerate the local deployment of telecoms services, including fixed-line connections, data centres and cloud computing solutions.

03

Mobile industry impact

Mobile technology plays a pivotal role in addressing critical environmental, social and governance (ESG) challenges within society. It facilitates the development of innovative solutions to improve access and usage in sectors such as education and healthcare, supports disaster management systems and contributes to efforts aimed at reducing carbon footprints. Mobile operators across Asia Pacific are at the forefront of many of these initiatives, collaborating with governments and other industry players to extend the benefits of connectivity to vulnerable populations and the broader community.

3.1
Strengthening disaster preparedness and response

Cell broadcast for early warning systems

As climate-driven disasters increase in frequency and intensity, early warning systems (EWS) are playing a crucial role in alerting people to imminent threats. Advanced warnings of events such as earthquakes, tsunamis or floods enhance emergency preparedness and save lives. With over 96% of the Asia Pacific population covered by a mobile network, mobile technology serves as an important channel to reach large numbers of people quickly and at scale. In this context, cell broadcast (CB) is an effective technology for the immediate dissemination of alerts to mobile users, including those who are not local to the area. The speed and scale of CB make it a vital communication channel for EWS, particularly when combined with other methods such as sirens and media broadcasts to ensure extensive coverage.

Below are examples of CB implementation in Asia Pacific:

- In May 2025, Thailand's True Corporation, in partnership with the National Broadcasting and Telecommunications Commission (NBTC) and the Department of Disaster Prevention and Mitigation, conducted a nationwide test of a CB-based emergency alert system. The test included three levels – minor, moderate and major – using the True and Dtac 5G network. The system is intended to send rapid, targeted alerts to mobile devices in specific areas during emergencies to improve public safety.

- The GSMA's Mobile for Humanitarian programme has collaborated with the Pacific Islands Telecommunication Association and Omnitouch to implement CB for early warning. The first test of CB-enabled alert dissemination occurred in May 2025. Located in the Pacific 'Ring of Fire', a chain of islands susceptible to frequent earthquakes and volcanic activity, the Solomon Islands is the initial location in this region to test the system. The project will extend CB-enabled EWS across the Pacific Islands in the following years.

- India's public warning system, Sachet, now incorporates four major operators to facilitate the nationwide dissemination of location-based SMS alerts. Recently, the Centre for Development of Telematics has been collaborating with operators to implement CB functionality, with testing currently in progress. This development represents a significant advancement in enhancing the country's disaster preparedness through mobile technology.

Industry collaboration to strengthen disaster response

Japan's geographic location in the 'Ring of Fire' and its monsoon climate make it one of the most disaster-prone countries in the world, facing frequent earthquakes, tsunamis, typhoons, floods, landslides and volcanic eruptions. In May 2025 alone, the country experienced several earthquakes, including a magnitude 6.1 earthquake in Hokkaido, and a volcanic eruption in Sakurajima. Such disasters have the potential to damage cell towers and fibre-optic cables, hampering rescue and recovery efforts in the affected areas.

In response to this challenge, in December 2024, Japan's telecoms operators – the NTT Group,[27] KDDI, SoftBank and Rakuten Mobile – announced the launch of a cooperative framework aimed at ensuring the rapid restoration of communication networks in the event of large-scale disasters. The framework enables the operators to jointly use each other's assets, such as business facilities, accommodation, storage sites, ships owned by the NTT Group and KDDI Corporation and refuelling stations. The mobile and fixed-line operators will also enhance their collaboration and share crucial information needed to assess damage and restore networks.

27. Includes Nippon Telegraph and Telephone Corporation, NTT East, NTT West, NTT Docomo and NTT Communications

3.2
Reducing carbon emissions

Sustainability has become a regular aspect of business for mobile operators and the broader telecoms ecosystem, with various initiatives focusing on green networks, energy efficiency, devices and SIM cards. With the increase in climate-related activities in the telecoms sector in recent years, the emphasis has been on improving network energy efficiency and fostering a culture change that integrates sustainability into corporate strategies. Due to rising costs, increased densification in the 5G era and the need to achieve CO_2 reductions to meet net-zero targets, the industry is undergoing a significant shift towards energy-efficient networks and renewable energy sources. Over 45 operators in Asia Pacific have announced net-zero targets, with 2050 being the main milestone (see Figure 10).

Figure 10

Number of operators in Asia Pacific* that have announced a target year for achieving net-zero emissions
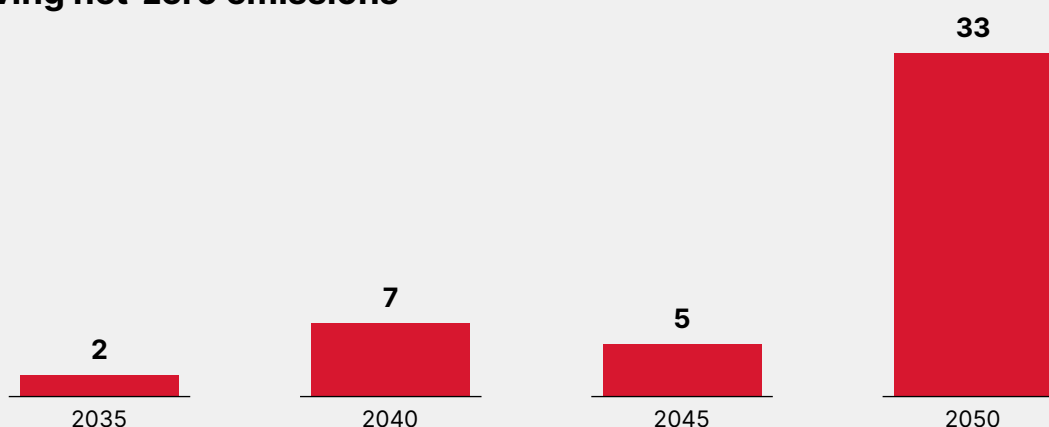
* Includes Greater China
Source: GSMA Intelligence, based on net-zero announcements

Across the region, operators and vendors are exploring different solutions to enhance sustainability, such as the following:

- **May 2025:** Robi Axiata teamed up with two renewable energy companies, FloSolar Solutions and GreenPower Asia, to develop a 100 MW solar project to power its operations in Bangladesh. The solar facility is expected to cut Robi's CO_2 emissions by approximately 68,200 metric tons annually. Robi intends to achieve a 45% carbon reduction by 2030 (with 2020 as a baseline) and attain the goal of net zero by 2050.

- **March 2025:** Jazz announced a collaboration with Huawei to deploy solar power technology at 1,000 of its mobile base station sites across Pakistan. The solution will reduce its energy costs by as much as 96% at the sites where the technology is installed. Jazz has committed to be carbon-neutral by 2050.

- **December 2024:** KDDI and J-Wind concluded a virtual power purchase agreement (PPA) for an onshore wind farm. KDDI expects the agreement to help it reduce CO_2 emissions at its telecoms base stations in the Kyushu area by approximately half in real terms.

Operators are also using AI to enhance sustainability by optimising energy use and reducing CO_2 emissions. AI's ability to process vast datasets and enable predictive analytics make it a powerful tool for decarbonisation in telecoms networks. In Singapore, Singtel uses AI to optimise energy consumption in its data centres, while Telstra in Australia uses AI to optimise its 5G networks, using predictive analytics to manage energy-intensive RAN operations and reduce emissions.

04

Mobile industry enablers

Mobile networks play a pivotal role in supporting the digital nation goals of governments across Asia Pacific. At the heart of this digital transformation lies 5G networks, which form the backbone of modern infrastructure, enabling a broad range of innovative services for both consumers and enterprises. As these services reshape society, policymakers in the region face the dual challenge of safeguarding consumers while fostering innovation. In this context, the following steps highlight the opportunities for policymakers in the region to create an environment that supports investments and encourages innovation.

4.1
Bridging the investment gap

Mobile operators in Asia Pacific are projected to invest over $200 billion in capex by the end of the decade. However, this amount is insufficient to build the infrastructure necessary for a digital future. From 5G networks to cloud infrastructure supporting virtualised services, the investment gap risks exacerbating an already significant digital divide and limiting the economic potential of digitalisation. This investment shortfall is due to several factors, including high deployment costs, fragmented regulations and uneven economic development across the region's diverse markets. Consequently, bridging this investment gap will require a combination of strategies by various stakeholders, including the following:

- **Fiscal incentives:** Private capital accounts for the majority of investments in digital infrastructure. However, a challenging fiscal environment can hinder this investment. Governments can unlock much-needed funding through forward-thinking fiscal policies, such as tax breaks or other fiscal incentives. For example, in Vietnam the government introduced incentives for operators in the form of a subsidy to cover 15% of the costs of base station equipment, provided operators were able to build 20,000 base stations by the end of 2025.[28]

- **Targeted funding:** Deploying infrastructure in rural and underserved areas often incurs high costs, increasing the likelihood of exclusion for individuals and businesses in those regions. Allocating targeted funding for specific connectivity projects can help mitigate this challenge by reducing the financial burden on operators for less commercially viable deployments. For instance, in 2024, $287.24 million was approved for the Philippines Digital Infrastructure Project, aimed at expanding the government's national fibre-optic backbone, middle-mile and last-mile connectivity networks.

- **Regulatory reforms:** Regulatory reforms, such as simplifying permitting processes and promoting spectrum and infrastructure sharing, can greatly reduce deployment costs. These measures are vital not only for expanding digital infrastructure in underserved areas but also for enhancing 5G coverage and rolling out small cells in urban regions, as the following examples show:

  – The Open Access in Data Transmission Act in the Philippines, also known as the Konektadong Pinoy Act, is a bill aimed at improving internet accessibility and promoting competition in the industry. It seeks to liberalise the telecoms market by removing the requirement for providers to obtain a legislative franchise, hence lowering entry barriers for new players. The bill also encourages infrastructure sharing and private-sector investment.

  – Vietnam's Telecommunications Law 2023, effective from July 2024, modernises the regulatory framework by explicitly including emerging components such as data centres, cloud computing and OTT services. The law also promotes infrastructure sharing by allowing telecoms facilities on public property and requiring building owners to facilitate installation.

- **Industry partnerships:** Partnerships are becoming increasingly important as operators collaborate with other digital ecosystem players (e.g. hyperscalers and satellite providers) to adopt new technologies such as cloud-native architectures and cost-effective coverage-expansion solutions. For instance, KDDI's partnership with AWS helps minimise the need for on-premises hardware investments and maintenance expenses, while operators in Australia and New Zealand have teamed up with satellite providers such as Starlink to extend connectivity to rural regions.

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28. "Vietnam to subsidize telecom providers for 5G network expansion", VietNamNet, February 2025

4.2
Balancing innovation and regulation

In a rapidly evolving technological landscape characterised by the rise of 5G, AI, blockchain and cloud technologies, quantum computing and other emerging innovations, technological progress drives the development of new industries, boosts productivity and enhances global competitiveness. Today, innovation rates throughout the digital ecosystem are remarkably high, with disruptive technologies emerging approximately every two to three years. One reason for this rapid progress is the 'virtuous circle' or dynamic feedback loop (see Figure 11). In this process, companies compete through innovation and this is rewarded with customers and profits, which then incentivises further investment in innovation.

Figure 11
Dynamic feedback loop for innovation

Services, coverage, affordability

User demand

Business plan profitability

Investment and innovation

Source: GSMA[29]

29. A new regulatory framework for the digital ecosystem, GSMA, 2016

However, innovation brings with it several responsibilities, including ensuring equitable access, consumer protection, cybersecurity and fair market competition. Given the rapid pace of innovation in contemporary societies, policymakers and regulators are faced with a critical task: establishing frameworks that balance innovation with regulation, thereby fostering socioeconomic progress while safeguarding both consumers and businesses.

Consequently, a key objective of regulatory policy should be to encourage (or at the very least, not significantly impede) innovation within the digital ecosystem. While the regulatory landscape in Asia Pacific remains diverse and somewhat fragmented, policymakers and regulators should draw upon the foundational principles of flexibility, technology neutrality and co-creation to promote progress while effectively addressing potential risks. Several of these principles are being incorporated into regulatory developments within the region, such as in the following examples:

- South Korea adopted its AI Framework Act in January 2025, which will take effect in January 2026. The Act is noted for its layered, transparency-focused approach to regulation and its balanced enforcement stance compared to the EU AI Act, with the goal of fostering AI innovation and development.

- Indonesia has implemented a regulatory sandbox mechanism that permits companies to test innovative solutions under government supervision. The purpose of this measure is to develop evidence-based laws and regulations that can accommodate the growth and innovation needs of specific sectors, such as fintech.

- In 2023, Singapore and the US collaborated to create an interoperable AI governance framework, providing greater clarity for companies to meet the requirements within both frameworks. It is expected to reduce compliance costs and create an environment conducive to AI deployment and innovation.

4.3
Accelerating 5G deployment through effective spectrum policy

Continued investments in 5G infrastructure and related innovation depend on clarity on spectrum availability. It is essential to develop detailed roadmaps for low-, mid- and high-band spectrum extending into the 2030s to realise the full potential of 5G and set the stage for 6G. More spectrum is needed for increased capacity and faster networks, especially low bands for digital inclusion and mid-bands for city-wide and indoor capacity. On average, 2 GHz of mid-band spectrum is needed and this requires long-term planning by regulators. The 6 GHz band will be crucial. At the World Radiocommunication Conference 2023 (WRC-2023), countries representing 60% of the global population sought to identify the upper part of the 6 GHz band (6.425–7.125 GHz) for licensed mobile. There is accelerating momentum behind the upper 6 GHz band as countries take steps to assign the band, confirming it as the harmonised home for the future of mid-band capacity.

Spectrum roadmaps

Roadmaps are an important means of ensuring there is sufficient spectrum for growing demand from consumers and new technologies. Clarity on future spectrum is critical for mobile operators to prepare investment plans, secure financing and develop arrangements for deploying different technologies. Across Asia Pacific, several countries have outlined spectrum roadmaps, with a focus on core bands, including the 2.6, 3.5 and upper 6 GHz bands. Some of these are highlighted in Figure 12.

Figure 12

Examples of spectrum planning in Asia Pacific

Country	Details
Bangladesh	Having released a spectrum roadmap in October 2024, the Bangladesh Telecommunication Regulatory Commission is planning to auction spectrum in the 700 MHz band to support the expansion of 4G networks for coverage and digital inclusion and laying the foundation for 5G during 2025. Additionally, spectrum in the 900, 1800 and 2100 MHz bands is due for renewal in 2026.
India	India has recently completed refarming of additional IMT spectrum in various bands and is preparing for a multiband auction in 2026, which will include all available spectrum (unsold and expiring) in existing bands and new bands such as 600 MHz and upper 6 GHz. A review of the National Frequency Allocation Plan was completed after WRC-23 and a new National Frequency Allocation Plan is expected soon.
Indonesia	The release of 700 MHz has been delayed since 2023, but based on its 2025–2029 Strategic Plan, the Ministry of Communication and Digital Affairs is planning to release several bands in 2025, including 700 MHz, 1.4 GHz, 2.6 GHz and 26 GHz. This will be followed by the 3.5 GHz band in 2027 to further expand mid-band spectrum supply.
Pakistan	Pakistan has one of the lowest amounts of assigned IMT spectrum in Asia Pacific. The Pakistan Telecom Authority had finalised a framework for a 5G multiband spectrum auction in May 2025, including key bands such as 700 MHz, 2.3 GHz, 2.6 GHz and 3.5 GHz. However, this has been delayed due to the ongoing Telenor–Ufone merger and litigation issues concerning licences.
Sri Lanka	The Telecommunications Regulatory Commission of Sri Lanka has been planning a 5G spectrum auction since 2021; however, delays have affected the timeline. A notice of assignment for the auction of 3.5 and 26 GHz was released for public consultation in December 2024, with the aim to conduct auctions by the end of 2025.
Thailand	In Thailand, the NBTC recently completed an auction of expiring spectrum in the 850 MHz, 2.1 GHz and 2.3 GHz bands and new spectrum in 1.5 GHz. Additional supply of mid-band spectrum will be necessary to support 5G-Advanced and future developments in mobile networks. The 3.5 GHz band is part of NBTC's 2024–2028 spectrum roadmap, though timing for availability is still pending due to incumbent fixed-satellite service usage.
Vietnam	Vietnam concluded its 5G spectrum auctions in 2024, assigning 300 MHz in 2.6 and 3.5 GHz to the three main operators – Viettel, VNPT and MobiFone. In May 2025, Viettel acquired 2×10 MHz in the 700 MHz band. Looking ahead, Vietnam is updating its national spectrum plan to include additional spectrum in the 3.5, 4.8 and upper 6 GHz bands to support future mobile needs.

Source: GSMA Intelligence

Spectrum pricing

The cost of spectrum also has a significant impact, both at the point of allocation and through ongoing fees and renewal costs. Governments and regulators should assign 5G spectrum to support their digital connectivity objectives rather than prioritising state revenue maximisation, as spectrum costs heavily influence investment in connectivity. A GSMA study found that the spectrum cost-to-revenue ratios in Asia Pacific markets have risen significantly over the last 10 years – from 3% in 2014 to 9% in 2023. The study also shows that a 10 percentage point (pp) increase in spectrum cost-to-revenue is associated with a 6 pp decrease in coverage and an 8 pp decrease in speeds.[30] In May 2025, Filipino consumer advocacy group CitizenWatch Philippines called on the government to reform the nation's Spectrum User Fee system, arguing that the current fee structure impedes the development of digital infrastructure and risks leaving millions without access to connectivity.[31]

Governments and regulators are increasingly mindful of the negative impact of high prices and poorly designed assignment mechanisms. Instead, they are adopting new pricing and licensing approaches to ease the financial pressure on operators while encouraging investments in connectivity and coverage. These approaches include extending licensing terms without additional payments, helping create an investment-friendly environment for the future, and attaching coverage commitments in exchange for lower prices when auctioning or renewing spectrum.

Vietnam: fiscal incentives for 5G network expansion

The recent auction experiences in Vietnam highlight the importance of effective spectrum pricing for 5G rollout. Following the failure of the 2.3 GHz auction in 2023 due to excessive reserve prices, the Authority of Radio Frequency Management carried out a comprehensive benchmarking exercise and reduced reserve prices by up to 90% for the 2.6 and 3.5 GHz bands. This led to the successful outcomes of the 2024 auctions and the subsequent rollout of commercial services later that year.

Following this, the government also introduced incentives for operators in the form of a subsidy to cover 15% of the costs of base station equipment, provided operators were able to build 20,000 base stations by the end of 2025, with the total subsidy amount capped at the revenue generated from the auction. This move allows revenue collected from operators to be reinvested into the industry, ultimately benefiting digital transformation in Vietnam. This serves as an example of supportive government policies for investment, which countries with upcoming auctions (see Figure 12) could emulate.

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30. Global spectrum pricing, GSMA, 2025
31. "Government urged to lower telco airwave fees to improve connectivity", Philstar.com, May 2025

WRC-27 and 6G leadership by Asia Pacific

Asia Pacific is home to several countries leading the progression of mobile technologies beyond 5G. These include:

- **India**, which has released the Bharat 6G Vision Document with ambitions to establish itself as a global leader in 6G technology by 2030

- **South Korea**, which has unveiled the K-Network 2030 Strategy with the aim of securing the world's leading 6G technology

- **Vietnam**, which has set up a 6G development group to evaluate, test and promote the research and development of 6G mobile technology.

The mobile ecosystem is collaborating with governments and international bodies to determine which bands may be utilised for the future expansion of mobile networks. It is expected that 200–400 MHz mid-band channels for full-power, macro-cell mobile will be required for 6G.

6 GHz spectrum is expected to play a key role in the next phase of data growth heading into the 2030s, but other bands are also under consideration. WRC-27 will evaluate bands in the 4.5, 7–8, and 14 GHz ranges. A particular focus is being given to the 7–8 GHz range, as this sits closely above the existing 6 GHz allocations.

As wireless connectivity extends from linking phones in people's pockets to machines in factories and vehicles on roads, sufficient spectrum will be necessary to meet this growing demand. Learning from the past, governments should focus on setting policies that stimulate long-term investment with tangible customer and ecosystem benefits in communication networks rather than encouraging a race to the latest radio technology. Working together with the industry on the evolution of mobile can ensure clear and transparent regulation that delivers both innovation and investment sustainability.
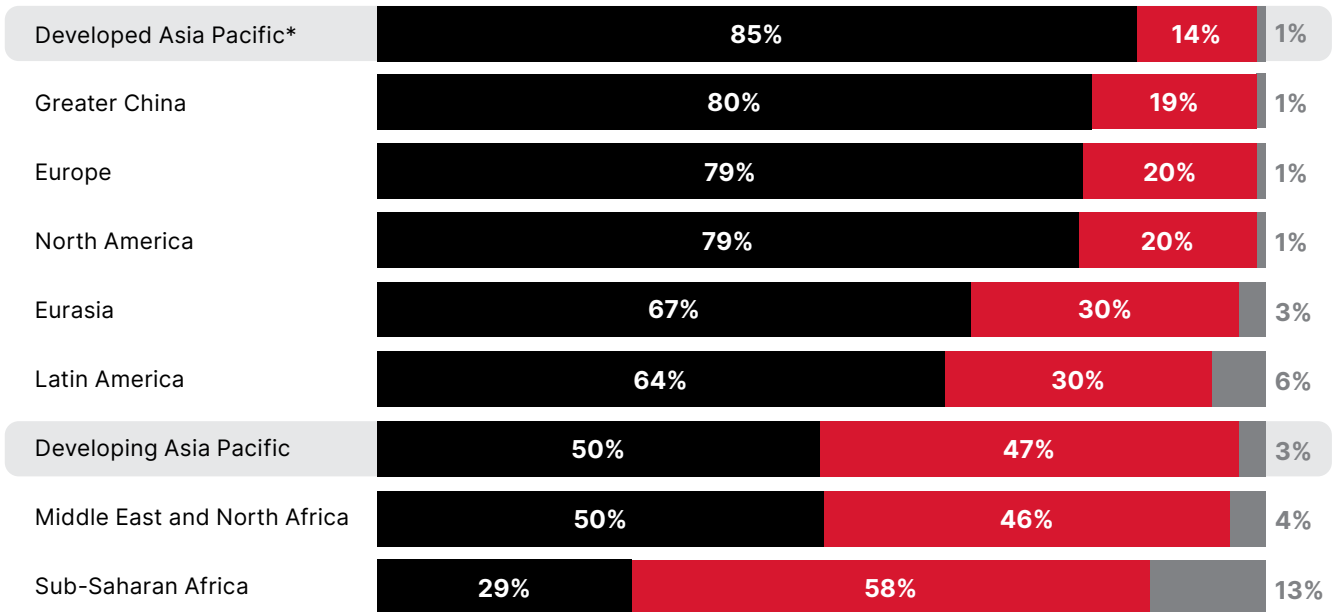
Industry
data

Mobile internet connectivity by region
Percentage of population

- ● Mobile internet subscribers
- ● Usage gap
- ● Coverage gap

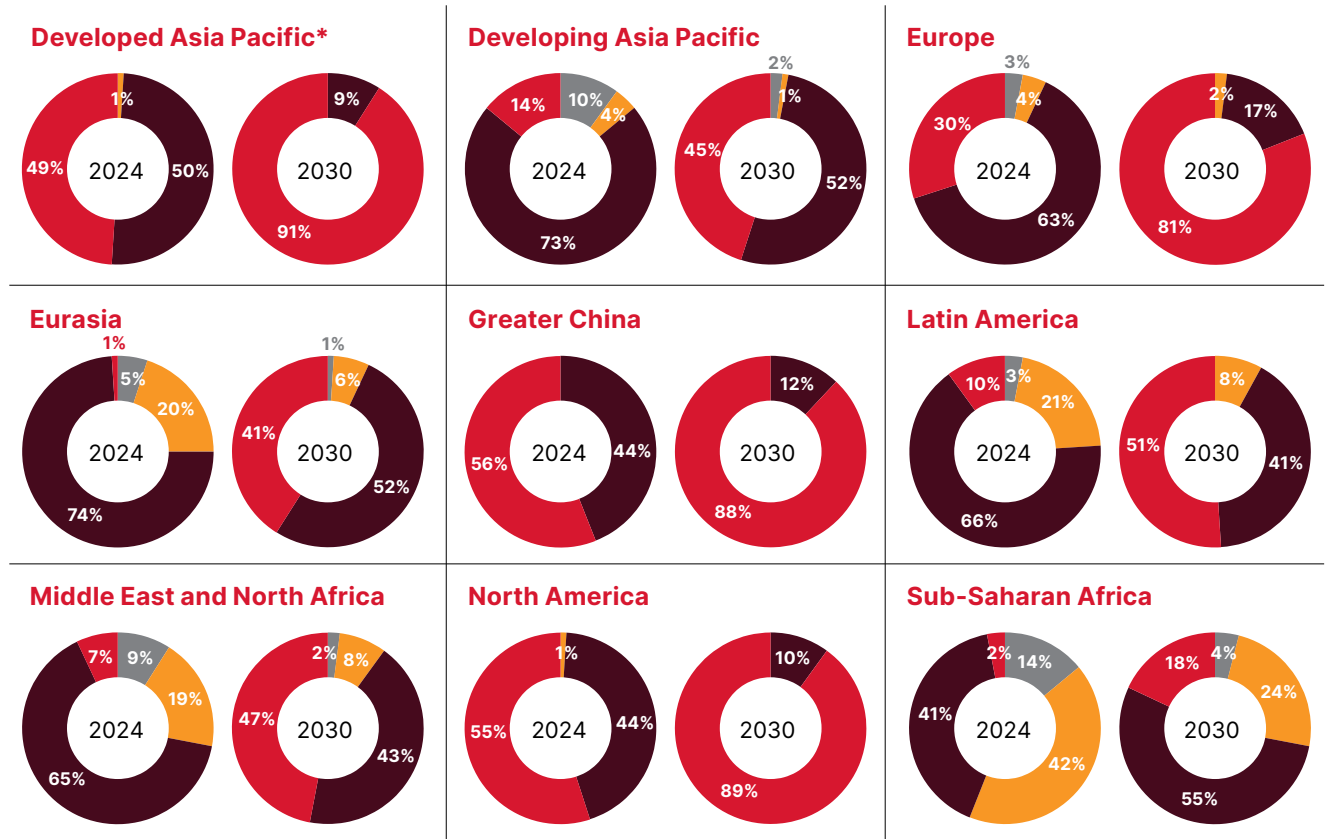| Region	Mobile internet subscribers	Usage gap	Coverage gap
Developed Asia Pacific*	85%	14%	1%
Greater China	80%	19%	1%
Europe	79%	20%	1%
North America	79%	20%	1%
Eurasia	67%	30%	3%
Latin America	64%	30%	6%
Developing Asia Pacific	50%	47%	3%
Middle East and North Africa	50%	46%	4%
Sub-Saharan Africa	29%	58%	13%

* Australia, Japan, New Zealand, Singapore and South Korea
Data correct to June 2025
Source: GSMA Intelligence

Mobile technology mix by region
Percentage of total connections (excluding licensed cellular IoT)

● 2G ● 3G ● 4G ● 5G

Developed Asia Pacific*
2024: 1%, 49%, 50%
2030: 9%, 91%

Developing Asia Pacific
2024: 14%, 10%, 4%, 73%
2030: 2%, 1%, 45%, 52%

Europe
2024: 3%, 4%, 30%, 63%
2030: 2%, 17%, 81%

Eurasia
2024: 1%, 5%, 20%, 74%
2030: 1%, 6%, 41%, 52%

Greater China
2024: 56%, 44%
2030: 12%, 88%

Latin America
2024: 10%, 3%, 21%, 66%
2030: 8%, 51%, 41%

Middle East and North Africa
2024: 7%, 9%, 19%, 65%
2030: 2%, 8%, 47%, 43%

North America
2024: 1%, 55%, 44%
2030: 10%, 89%

Sub-Saharan Africa
2024: 2%, 14%, 41%, 42%
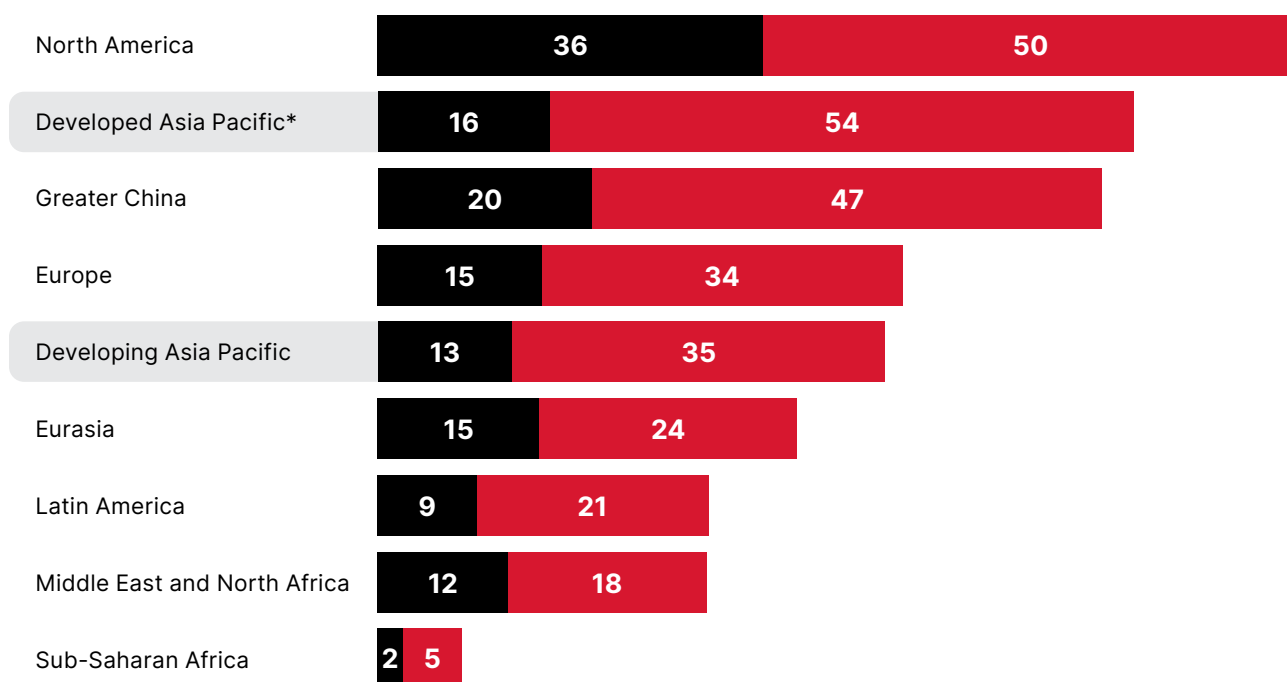2030: 18%, 4%, 24%, 55%

* Australia, Japan, New Zealand, Singapore and South Korea
Note: Totals may not add up due to rounding.
Data correct to June 2025
Source: GSMA Intelligence

Average mobile data traffic per connection by region

GB per month

- 2024
- 2025–2030 increase

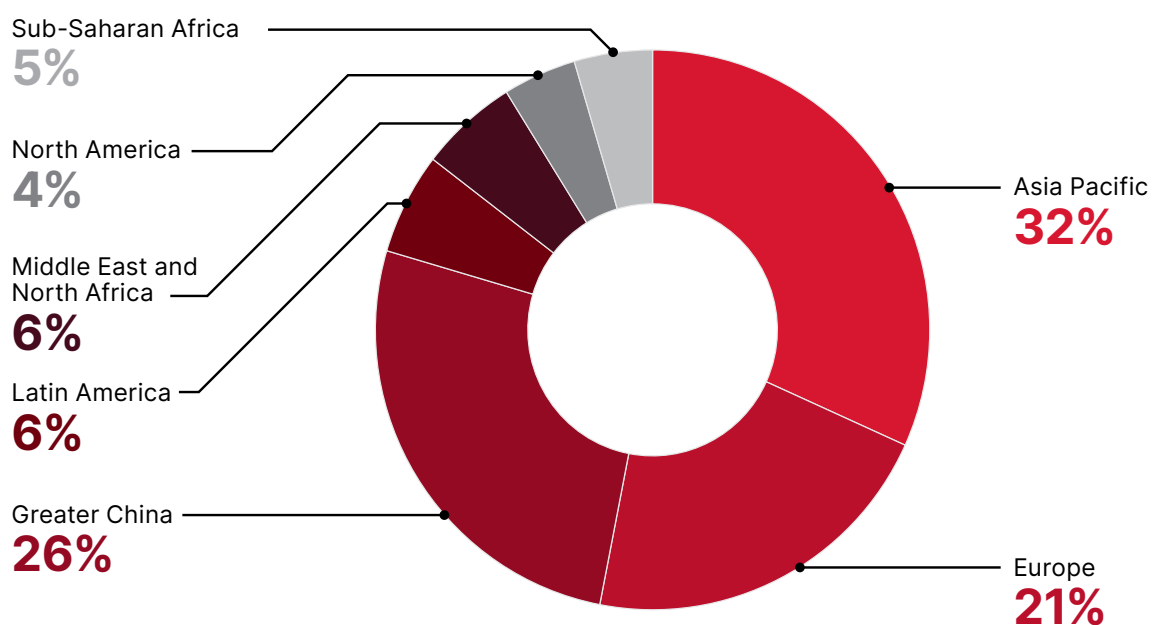| Region	2024	2025–2030 increase
North America	36	50
Developed Asia Pacific*	16	54
Greater China	20	47
Europe	15	34
Developing Asia Pacific	13	35
Eurasia	15	24
Latin America	9	21
Middle East and North Africa	12	18
Sub-Saharan Africa	2	5

* Australia Japan, New Zealand, Singapore and South Korea
Data correct to June 2025
Source: GSMA Intelligence

Participation in the GSMA Open Gateway initiative by region

Percentage of total participating operators based on total mobile connections

- Sub-Saharan Africa **5%**
- North America **4%**
- Middle East and North Africa **6%**
- Latin America **6%**
- Greater China **26%**
- Asia Pacific **32%**
- Europe **21%**

Data correct to June 2025
Source: GSMA Intelligence

GSMA Open Gateway API deployments by operators in Asia Pacific*

	Australia	Cambodia	India	Indonesia	Japan	Malaysia	Pakistan	Philippines	Singapore	South Korea	Sri Lanka	Thailand	Vietnam
Call Forwarding Signal				✓									
Carrier Billing											✓		
Device Location Verification			✓	✓					✓		✓	✓	
Device Roaming Status			✓										
Device Swap			✓										
Know Your Customer					✓								
Number Verification		✓	✓	✓		✓		✓	✓		✓	✓	
OTP Validation			✓				✓				✓		
Quality on Demand													✓
Sim Swap			✓	✓		✓					✓	✓	
Simple Edge Discovery	✓									✓			

* Shows technically ready, commercially available or commercially live APIs
Data correct to June 2025
Source: GSMA Intelligence

Further resources

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GSMA Open Gateway: State of the Market, H1 2025, GSMA Intelligence, 2025

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