Global Mobile Trends 2026

Opportunity in an era of upheaval

March 2026

gsmaintelligence.com

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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GSMA Intelligence

GSMA Intelligence is the definitive source of global mobile operator data, analysis and forecasts, and publisher of authoritative industry reports and research. Our data covers every operator group, network and MVNO in every country worldwide – from Afghanistan to Zimbabwe. It is the most accurate and complete set of industry metrics available, comprising tens of millions of individual data points, updated daily.

GSMA Intelligence is relied on by leading operators, vendors, regulators, financial institutions and third-party industry players, to support strategic decision-making and long-term investment planning. The data is used as an industry reference point and is frequently cited by the media and by the industry itself.

Our team of analysts and experts produce regular thought-leading research reports across a range of industry topics.

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This report was written by GSMA Intelligence with support from sponsors.

GLOBAL MOBILE TRENDS

This report is the latest edition of the Global Mobile Trends series.

Much has changed since our first publication in 2015. Technology has advanced and companies have come and gone.

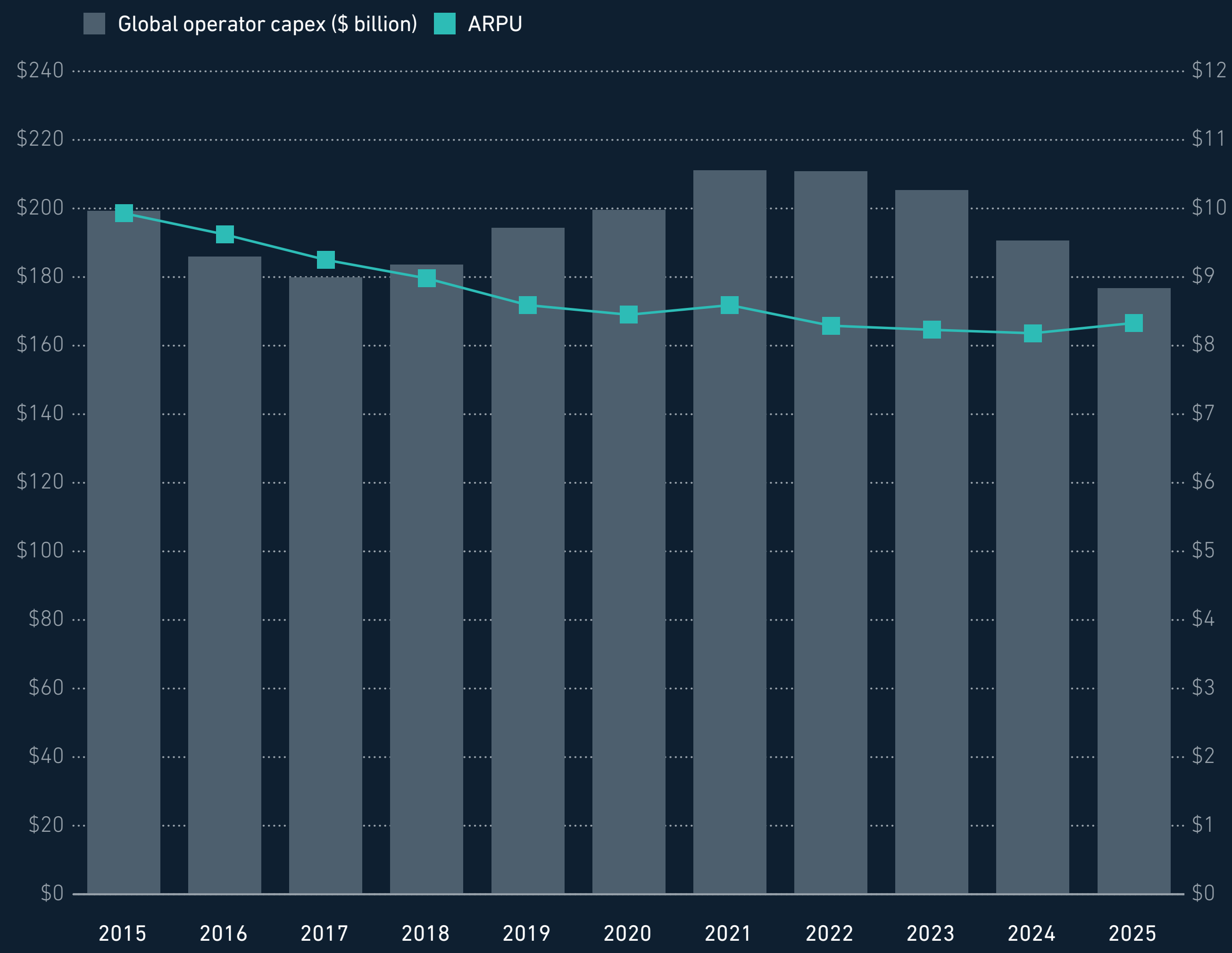
As always, the purpose is simple: understand the biggest and most important things happening in telecoms and the broader TMT industries, and explain what they mean for people, companies and governments.

We hope it is useful insight into the opportunities, innovations and challenges facing the industry, and encourage you to engage with us.

Context

The mobile industry's financial sustainability problem is clear but also masks significant, evolving opportunities

- **Telco malaise.** Over the past decade, capex among telecoms operators has remained high. Per-user revenue, meanwhile, has steadily declined.
- **Architecture upheaval.** The 2G-to-5G journey has been accompanied by the introduction of new network architectures including cloud, non-terrestrial networks, private wireless networks and autonomy.
- **Technology upheaval.** Driving new architectures has been the rapid proliferation of new technologies such as 5G, AI and silicon advancements.
- **Competitive upheaval.** New technologies and architectures have upended a once familiar set of competitors for operators.
- **Crisis versus opportunity.** A focus on financial challenges and market upheaval in telecoms is understandable but fatalistic. It overlooks the potential for these technologies and architectures to drive value for operators, consumers, businesses and society.



Source GSMA Intelligence

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AI for telco

The drive to an agentic future

GLOBAL MOBILE TRENDS

AI for telco

☆ News highlights

ⓘ Why it matters

Network complexity can be managed without AI; user experience cannot

Cloud is about AI, and telco AI is about cloud

RAN AI underscores optimisation versus monetisation focus

Agentic telco is a work in progress; agentic RAN is coming

More than words: telco AI launches reflect network bias

Considerations for the year ahead

☆ News highlights from the last year

Chatbots dominate telco AI applications, but 2025 saw agents gain traction across key use cases. An overwhelming industry focus on agentic AI masks broader cloud and data requirements as well as physical AI opportunities.

FEBRUARY

Amdocs goes big on agents with amAIz suite and Google

At MWC 2025, Amdocs announced the availability of its amAIz Suite and amAIz Agents on Google Cloud. Leveraging Google Cloud's tooling and unified data platform promises broader reach into telecoms operators.

FEBRUARY/JUNE

Telco data platforms take centre stage as AI enablers

At MWC 2025, the Microsoft Fabric Telco Industry Data Model was unveiled, while Ericsson and Nokia used DTW Ignite to highlight their own unified data platform offers. All promise to fuel AI use cases.

MARCH

Nvidia partners to drive telco-specific large language models (LLMs)

At the GTC AI conference, Nvidia announced support for "large telco models" (customised LLMs trained on telco network data), put into use by partners including SoftBank and Tech Mahindra.

APRIL

e&'s AI-powered drones take on tower inspection

Building on the launch of UAE's Drones Operations Centre, e& announced autonomous drone-based cell tower inspections for improved safety, accuracy and sustainability.

MAY

Ooredoo's Obot goes multi-channel

Powered by GPT-4o, the AI chatbot offers typical customer-support functions (e.g. assistance, product recommendations) across the operator's app, web, messaging and social channels.

JUNE

Huawei and China Telecom win with O&M agents

The operator and vendor received the TM Forum Excellence in Data and AI award for scaling the use of AI and agent applications in support of fixed and mobile operations and maintenance.

JULY

Optus Expert AI supports agents with agents

Using Google's Customer Engagement Suite, Optus launched an agentic AI solution, arming frontline staff with intelligence in support of consistency, speed and quality across sales and service interactions.

OCTOBER

Nvidia invests in Nokia to drive AI RAN ambitions

A $1 billion investment will see Nokia integrating the AI silicon giant's ARC-Pro RAN computing platform, aimed at supporting 5G-Advanced through to 6G launches.

Source Company press releases

Why it matters in 2026

Monetising AI remains a challenge, but AI-driven ops is well understood

Efficiencies are certain

Opex trumps capex, with AI a useful tool. Operator capex may grab the headlines, but capex is a fraction of what operators spend on operations. To keep opex in check, most have been leveraging AI and automation for efficiencies.

New AI-driven revenues are uncertain. While AI might power new customer-facing offers, success remains relatively unknown versus the track record of network and operations support.

Experience versus churn

Quality supports experience. AI to support network and service operations has a clear role in driving opex and capex efficiencies. It would be a mistake, though, to ignore its role in customer experience improvements through better performing networks and improved customer support.

A penny saved is a penny earned. Experience improvements may not lead directly to new revenue streams, but they serve to keep customers from churning, preserving the revenue base.

Baby steps for agentic AI

High-profile agentic disappointment. In 2025, agents dominated the AI conversation in telco circles and beyond. In many instances, the value they delivered was questionable, failing to match industry hype. In telecoms, this was seemingly reflected in most operators remaining in a testing or planning phase with agentic AI.

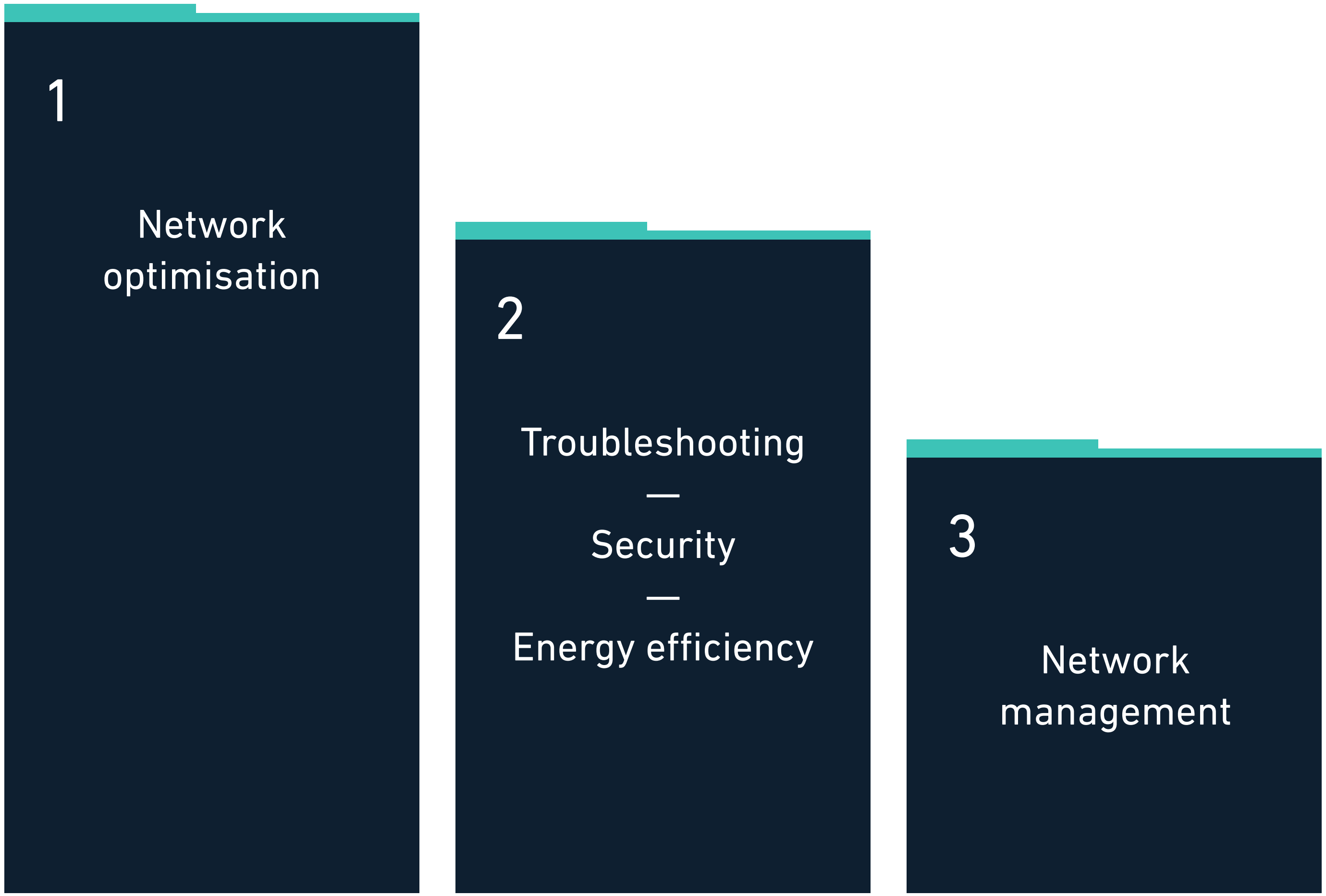
Quiet successes. There is little doubt agents can deliver value. Early deployments and trials should prove that value as they scale.

Network complexity can be managed without AI; user experience cannot

- **Automation versus AI in network management.** AI promises efficiencies across complex telecoms networks and services. However, the automation of many network management functions is mature, so AI is not always a necessity.
- **Experience is where AI shines.** A focus on optimisation, security and network troubleshooting highlights that operators see AI's real value in delivering better end-user experiences through their networks.
- **Experience in support of growth.** Energy and network management efficiencies may spur opex savings. However, the focus on user experience underscores operators' revenue agendas, through differentiated services, customer acquisition or churn reduction.

Network AI is all about user experience

Top use cases for deploying AI technologies to support networks



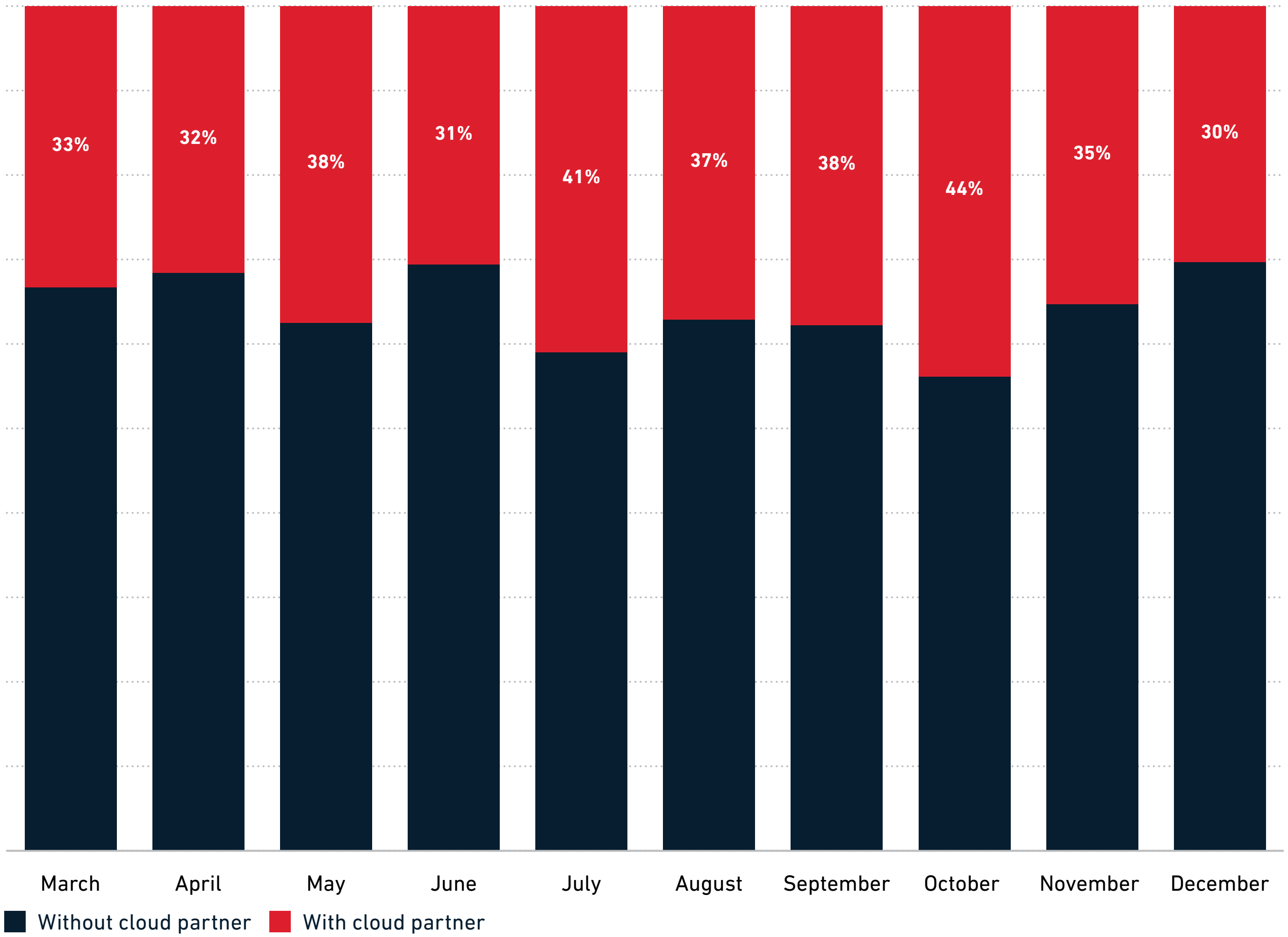
Source GSMA Intelligence Network Transformation Survey 2026

Cloud is about AI, and telco AI is about cloud

- **AI dominates cloud investment.** Hyperscalers spent much of 2025 racing to build new data centres to support AI demand.
- **Tapping cloud to support AI ambitions.** As the cloud players became synonymous with AI, operators turned to them to execute their own AI strategies. In 2025, more than a third of operator AI launch announcements involved a cloud partner.
- **With, through and for.** Partnering to deliver AI takes many forms, including solution co-development, reselling existing cloud services, and launching new services on cloud infrastructure. Each strategy brings its own risks and rewards. Operators will continue to pursue all of them.

Cloud is an integral part of telco AI initiatives

Percentage of AI-related announcements from telecoms operators that involved cloud players, Q2–Q4 2025



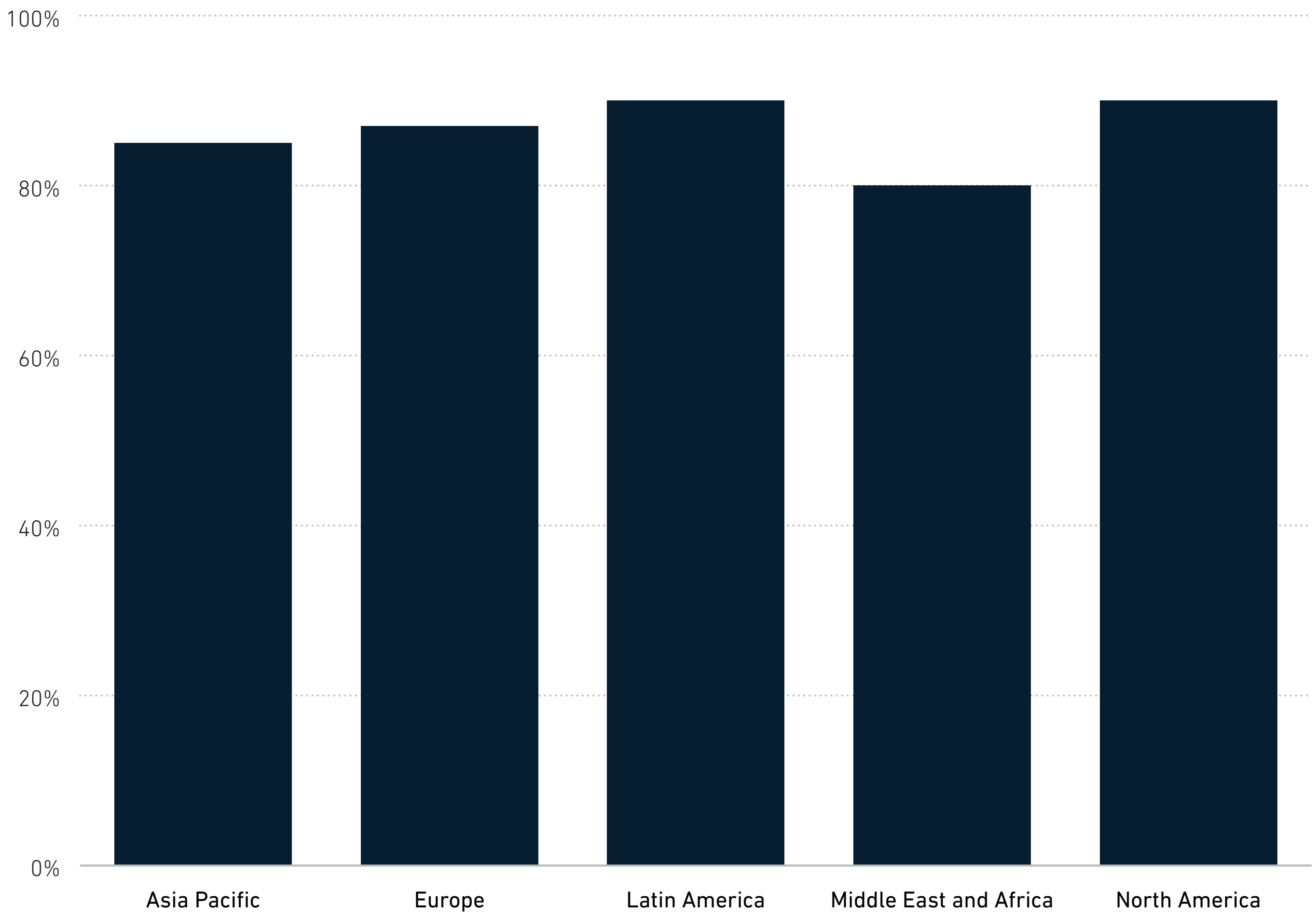
Source GSMA Intelligence Telco AI Tracker

RAN AI underscores optimisation versus monetisation focus

- **The power of RAN.** Radio access networks represent an operator's greatest capex, a major opex burden and a direct touchpoint with consumers.
- **The RAN AI opportunity.** AI in support of optimised RAN energy use or performance is mature. AI integrated into RAN standards, the use of AI processors to power RAN functions or the use of RAN processing to power AI workloads all represent proposed RAN-AI synergies.
- **The challenge of the unknown.** With the uncertain value or unproven nature of integrating AI with RAN processors or standards, most operators see AI's proven value in RAN optimisation as their top use case.

Optimisation is the only thing that matters to operators in terms of AI in the RAN

Percentage of operators rating RAN optimisation as the top use case for AI in the RAN, by region



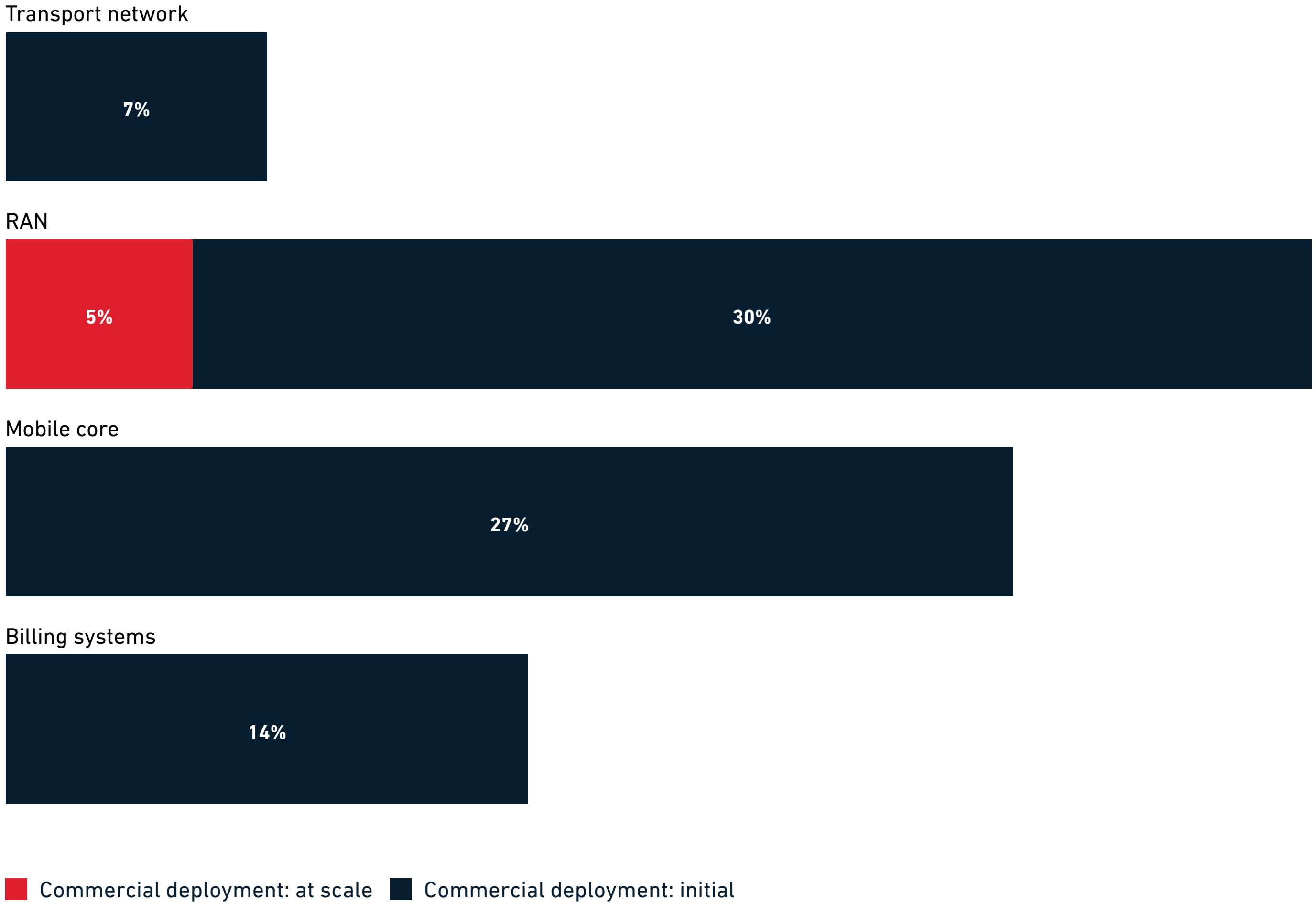
Source GSMA Intelligence Network Transformation Survey 2026

Agentic telco is a work in progress; agentic RAN is coming

- **The agentic hype cycle.** Promising 'automation on steroids', AI agents were a core part of the 2025 telco operations innovation narrative.
- **Solid or limited progress?** With operators traditionally risk-averse towards new network technology, it would be surprising to see full-scale, commercial adoption of agents. Scaled deployment in the RAN and limited rollouts elsewhere suggest an appetite to leverage agentic AI but with the technology's potential still largely untapped.
- **Agentic optimisation in the RAN.** With optimisation claimed as the greatest AI-RAN use case, it is unsurprising that the RAN has seen the most progress with commercial agentic rollouts.

Use of agentic AI remains in its infancy, with the most attention given to the greatest capex

Percentage of operators commercially deploying agents in their network infrastructure, across domains



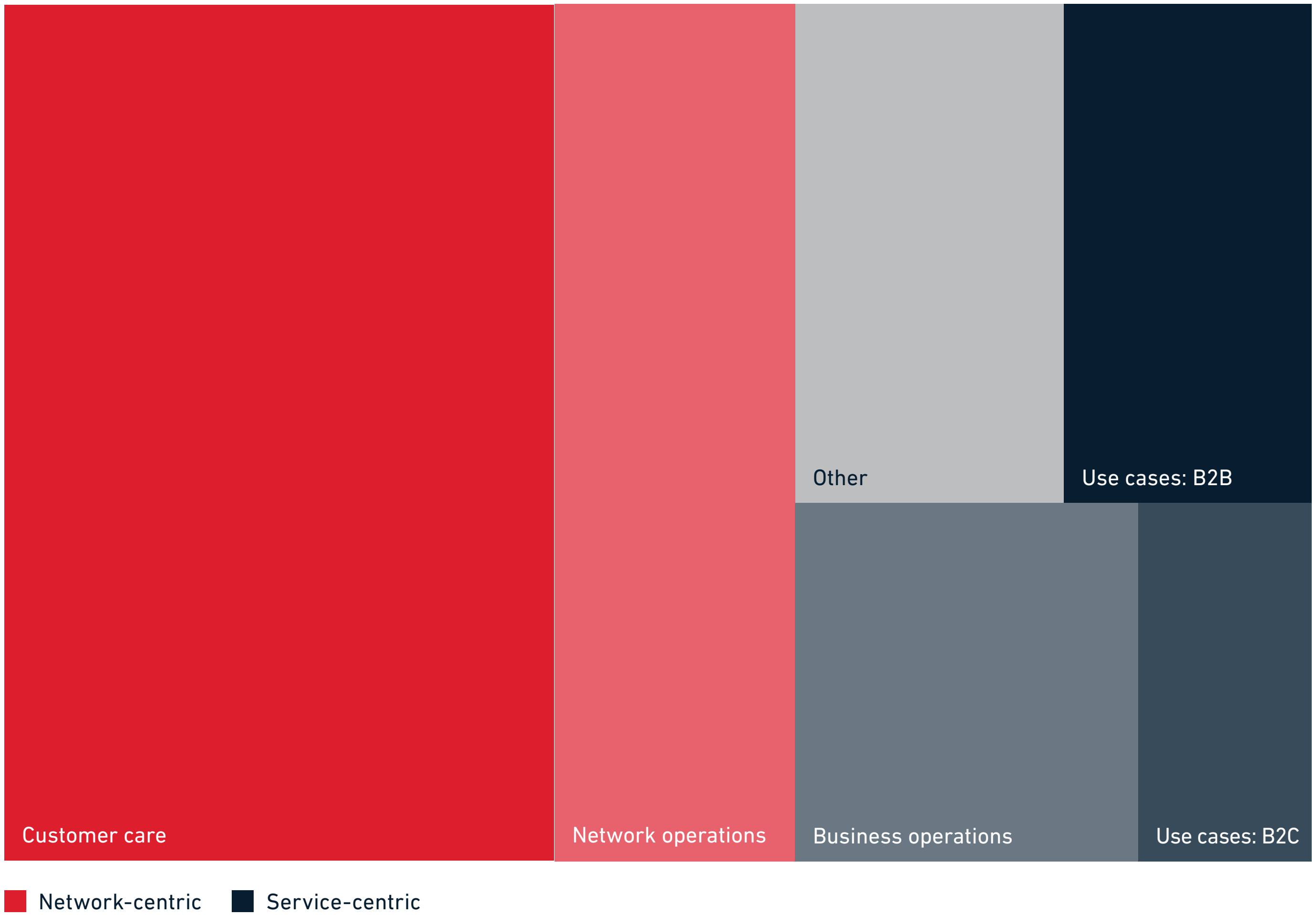
Source GSMA Intelligence Network Transformation Survey 2026

More than words: telco AI launches reflect internal bias

- **The breadth of telco AI.** Operators put AI to use in many different ways. Announcements from 2025 include customer care, internal operations and network operations use cases, as well as data-centre builds and AI-centric service launches targeting B2B and B2C users.
- **Internal versus external.** While network, care and operations use cases are generally inward focused, new services and data-centre builds aim to engage customers.
- **Revenue generation aspirations remain challenging.** While user-facing services and investment were announced in 2025, most operator activity was internal in nature and less focused on new revenues.

Network and customer care dominated telco AI launches in 2025, with monetised AI a minor focus

Distribution of 2025 telco AI announcements by use case



Source GSMA Intelligence Telco AI Tracker

Considerations for the year ahead

Scaling agents versus building 6G

- **Agentic value and agentic expertise.** The potential for AI agents to drive revenues and efficiencies ensures a growing fascination among operators. As they are deployed, the value of agents and how to deploy them at scale will be better understood. Ensuring exposure is built across diverse domains will be key.
- **Beyond 5G R&D.** Rivalled only by an agentic AI imperative is the march to 6G networks, including AI RAN innovation. Broader AI strategies will need to focus on both, but battles for resources and focus are inevitable.

Skills and expertise

- **Skills are the biggest gap.** Even where AI use cases are deployed for an operator by vendor partners, a lack of internal AI know-how will impact the speed at which solutions are integrated and strategies built. Six in 10 operators surveyed claim expertise as the biggest challenge to AI deployment. It is good that they see their shortcomings – but only if they act to remedy them.
- **Cloud and AI together.** To the extent that AI relies heavily on cloud resources, any AI-focused upskilling must include a focus on cloud skills, with AI upskilling ideally integrated into existing cloud training.

AI for telco, for AI

- **The dichotomy is fake.** AI can be used in support of telco operations, and telco operations can be used to support AI. However, it will increasingly be seen that networks that support AI also require AI to deliver on their requirements.
- **Where are the synergies?** While most telco AI activity has centred on internal use cases, understanding how AI for network and service operations can support external use cases will help with ambitions to monetise AI.

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AI for Telecom

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Telco for AI

Eyes on the prize

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Telco for AI

☆ News highlights

ⓘ Why it matters

Monetisation waits for no one, with AI no exception

Inference value is pushing out on the edge

Tech still comes down to business value

AI factories are next, but can they work?

Maximising the USP versus the hyperscalers

ⓘ Considerations for the year ahead

☆ News highlights from the last year

Operators are strengthening their AI capabilities to enable large-scale AI deployments, enhancing customer experience and automating tasks across different industries.

MARCH

Sunrise offers Perplexity Pro access to customers

Sunrise announced it will offer a free, one-year Perplexity Pro subscription to all its residential customers.

APRIL

Deutsche Telekom extends partnership with Google Cloud

Deutsche Telekom has selected Google Cloud as its preferred partner to shift key business areas to the cloud, including AI applications. This will contribute to Deutsche Telekom's digital transformation strategy.

APRIL

Airtel enhances its AI-powered spam protection tool

Airtel has enhanced its spam protection tool, which will alert customers to spam calls and SMS in their preferred language. The new feature is available in nine vernacular languages.

JUNE

Bouygues Telecom launches AI-powered voice agent

Bouygues Telecom's AI-based voice agent will streamline call handling for public institutions and medium-sized businesses in France. The service aims to enhance user experience and ease workloads for staff.

JULY

Ooredoo launches Sovereign AI Cloud Services

Ooredoo Sovereign AI Cloud Services, powered by Nvidia Hopper GPUs and hosted in its local data centres, will support AI deployment across sectors such as energy, finance, logistics and healthcare.

SEPTEMBER

Telekom Malaysia to enhance customer experience through AI

In partnership with Scicom, Telekom Malaysia will use AI solutions such as conversational bots and predictive analytics, aiming for faster responses and improved customer satisfaction across all channels.

OCTOBER

Movistar Spain launches AI-based business messaging

Movistar has launched the service to automate and streamline communication for companies and public administrations. It will personalise interactions, help optimise operations and reduce costs.

DECEMBER

SoftBank begins collaboration for physical AI robots

SoftBank has signed an agreement with Yaskawa Electric for the deployment of physical AI, leveraging the operator's AI-RAN initiative and Yaskawa's AI robotics.

Source Company press releases

Why it matters in 2026

Everyone needs an AI strategy

The urgency to monetise

Growth story needed. Operators need a growth story, which has been middling in the 5G era. By operationalising AI factories and real-time inference at the edge and in core networks, they can monetise unique assets such as network-aware intelligence and distributed compute.

The potential for a service play. An AI strategy enables offerings such as predictive network automation, personalised customer experiences and AI-driven B2B services, which command premium pricing, potentially across a range of verticals.

Infrastructure USP

Looking to an infrastructure USP. Distributed infrastructure, proprietary data and sovereign AI provide fertile ground for inference and compute services that hyperscalers are unable to easily replicate.

Conversion into practice is the challenge. There is a window of opportunity to become partners for enterprises seeking low-latency, secure and context-rich AI applications in areas such as private 5G, IoT and industrial automation. However, theory and practice do not always align.

Competitive opportunities and risks

Significant risks ahead. Risks include high levels of investment in AI talent and compute, the operational complexity of maintaining AI factories, and competition from hyperscalers' deep pockets and mature ecosystems.

Sovereignty and intangibles represent opportunities. Satisfying data sovereignty requirements is a major differentiator. Intangibles such as governance and ethics will also come into play as trust pillars for enterprise buyers in weighing up the returns on telco spend.

Monetisation waits for no one, with AI no exception

- **Business trumps technology.** As much as AI technology is at the centre of the technology world (and wider economy), the business value will still largely be judged on costs and revenues. Operators are no different here.
- **Revenue objectives grow.** Operators are increasingly looking to use AI to enhance the telco stack or create new products. GSMA Intelligence data indicates that of the telco AI deployments launched in the six months to December 2025, 25–50% are there to drive revenues (versus 10–15% a year ago). The focus in 2026 will be on experimenting with revenue models to monetise telco AI capabilities.

Telco AI deployments are still mostly about efficiencies, but revenue is firmly in play

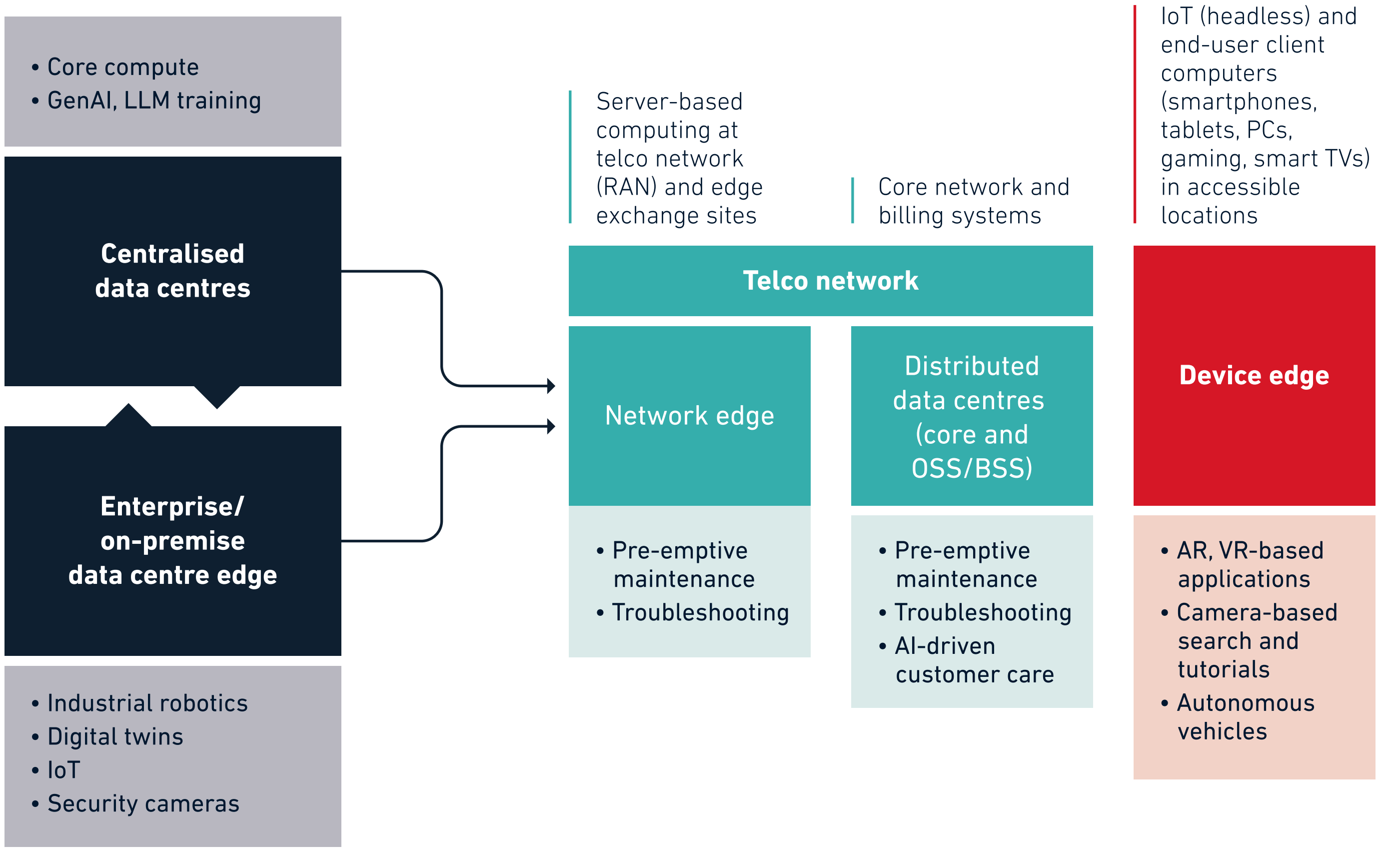
	AI deployments launched Cumulative	**New deployments by internal/external objective** Six months to December 2025 **Internal** (costs and efficiencies)	**External** (product revenue)
Europe	134	73%	27%
Asia Pacific	133	75%	25%
MENA	49	91%	9%
North America	15	50%	50%

Source GSMA Intelligence

Inference value is pushing out on the edge

- **Edge is a spectrum rather than a place.** The edge is a continuum of compute that moves from a central point (the public cloud) out towards the end user. This can be a business premises or consumer device (e.g. smartphone or car).
- **Go to market: what and when?** The value of inferencing on the edge is in the TCO savings available versus the cloud, as well as other factors including network resilience and data sovereignty. The latter is of particular interest to operators, who have a competitive USP against the hyperscalers in light of their national presence/spectrum licences and assurances on the retention of data within national borders. However, converting that USP to sales will require speed to market.

Edge compute nodes and inference use cases



Source GSMA Intelligence

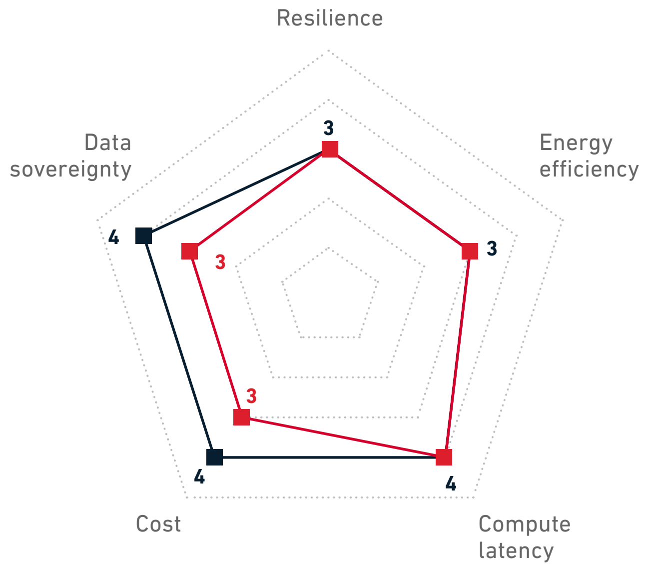
Tech still comes down to business value

- **Knowing your customer.** GSMA Intelligence inference analysis highlights several industry verticals that have a value incentive to run AI workloads on the edge. Examples include AI image analysis on security cameras (such as in a retail store) and inventory management (in a hospital, for example).
- **Proof points are crucial.** The key is understanding which selling points (e.g. lower cost, better compute latency) have the highest impact for each use case compared to the cloud. This has a clear flow-through to the commercial prospects of operators and their IT partners.

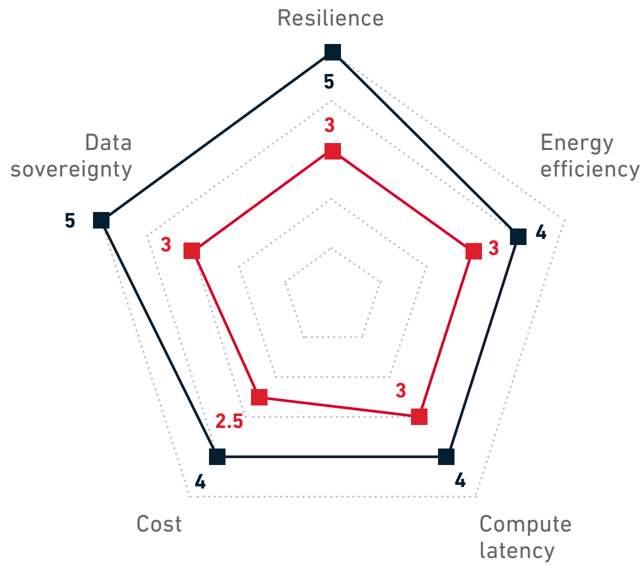
Comparing AI inferencing options

Scores are based on typical performance characteristics for a typical deployment. 1 = least favourable; 5 = most favourable.

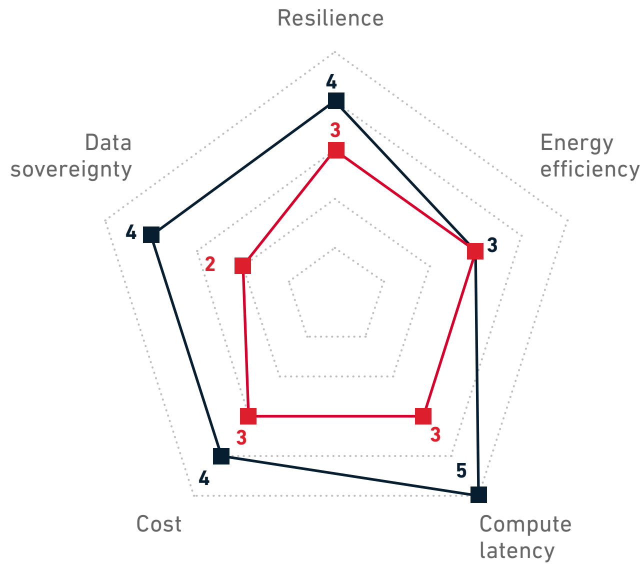
AI network engineer (telco)



AI security cameras (large retailer)



AI inventory management (hospital)



Cloud Edge

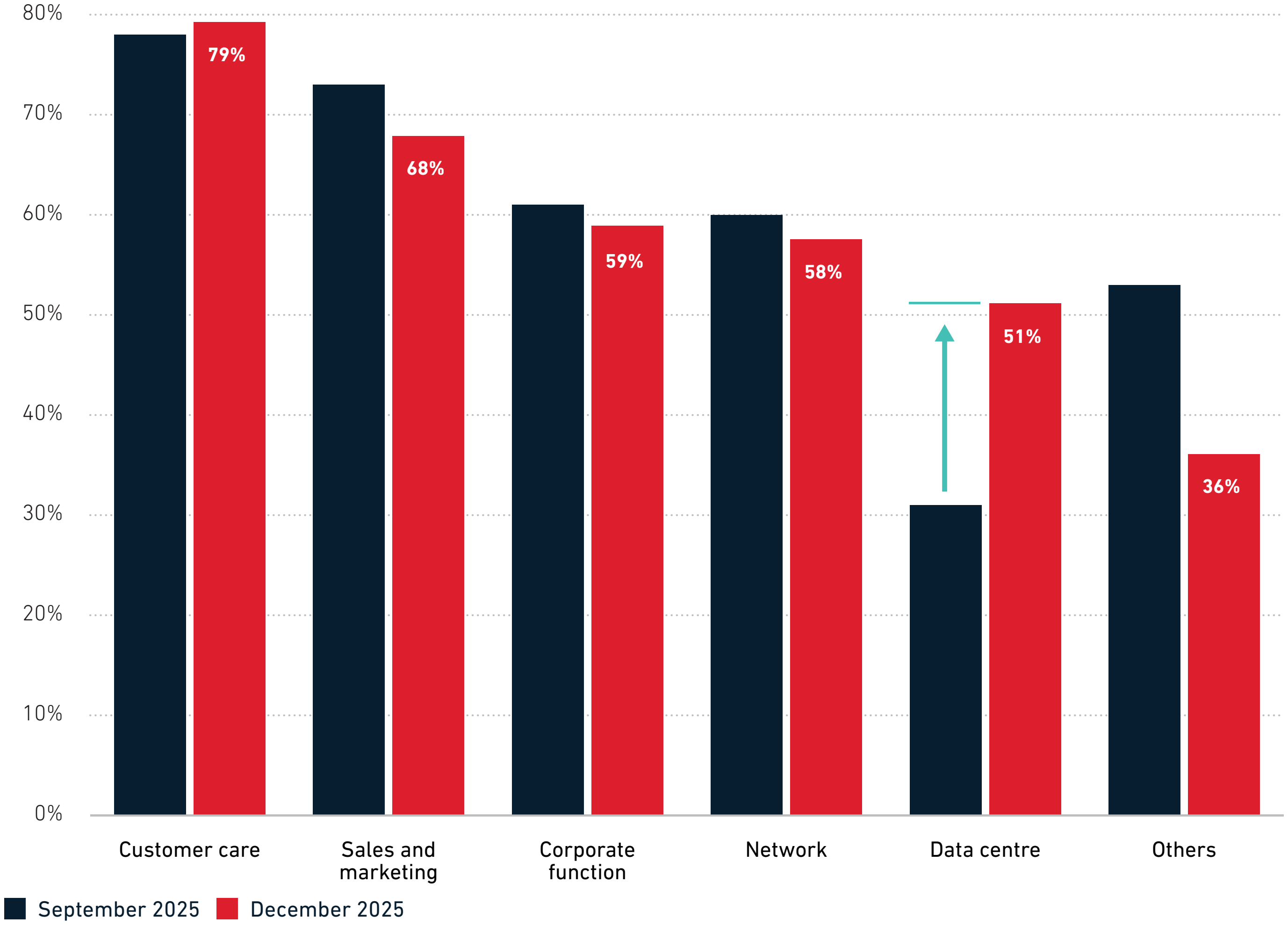
Source GSMA Intelligence

AI factories are next, but can they work?

- **Can the world support more clouds?** AI factories are specialised telco data centres built to run AI compute workloads at scale. The investment premise is based on operators selling GPU as a service (GPUaaS) paired with a service and connectivity layer that enterprise buyers use for their own workloads. The recent spike in operator data-centre activity is an indicator of the infrastructure build-outs taking place (see chart).
- **A commercial challenge for operators.** Companies such as Amazon, Microsoft, Google, Alibaba and Oracle have far larger data-centre footprints to leverage. The USP for operators is likely to rely heavily on sovereign AI, considering the growing number of countries with data retention requirements in light of IP protections and geopolitical tensions.

Data centre activity reflects infrastructure build-outs

Percentage of operator AI deployments that are live



Source GSMA Intelligence

Maximising the USP versus the hyperscalers

- **The prospect of vertical integration.** The telco stack is anchored in cellular and fibre infrastructure, extending up to integration tools and a suite of applications that sit on top for developers and enterprises. This offers the prospect of vertical integration for AI services, by leveraging the capabilities under one roof.
- **The challenge of commercial execution.** The test will be to convey the value proposition in practice. Orchestrating a culture pivot towards working more as an IT consultancy than a connectivity seller is integral to AI monetisation for operators, with 2026 providing a limited window to act.

The telco stack for AI monetisation

Apps	• Enterprise and domain-specific apps • AI agents and stacks • Business intelligence apps
AI engineering tools	• Tools and frameworks to map to enterprise workloads • Orchestration • Use-case mapping
Models (LLM/SLMs)	• Domain-specific model training • Model training • AI platforms (enterprise data centre, industrial edge, device edge)
Infrastructure	• Connectivity layer (intra and inter data centre) • Cloud infrastructure (centralised/edge), storage, memory • Compute layer (semiconductors, GPU processors)

Source GSMA Intelligence

Considerations for the year ahead

The value of the network

- **Network investment is required.** Telco AI monetisation will depend on networks engineered for AI workloads, including low latency, deterministic performance, edge density and energy efficiency.
- **Where to start?** Priorities include tighter integration of network, edge and cloud resources; support for distributed inference and on-device offload; and exposing network capabilities (quality of service, slicing, location, security) via APIs, so AI services can be differentiated and priced at a premium rather than delivered as best-efforts connectivity.

AI factories and inference

- **'Everything but the kitchen sink'.** Monetising AI factories requires robust data governance, modular model pipelines, cost-efficient compute infrastructure, and clear KPIs to measure value creation rather than just experimentation.
- **Inference leads to differentiation.** Investment in inference capabilities is required at the edge and on customer devices. In practice, this means understanding device resource constraints, efficient model footprints and security.

Commercial execution

- **Matching supply to demand.** To execute effectively, operators should prioritise go-to-market strategies that align AI capabilities with high-value vertical use cases (manufacturing, healthcare, logistics) and developer ecosystems.
- **Partnerships required.** Going it alone is not possible in most cases. This means establishing clear value propositions and pricing structures, and fostering partner marketplaces and APIs that accelerate adoption by enterprises requiring turnkey and scalable AI-enabled solutions.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Autonomous networks

Agentic AI's promise to deliver on intent

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Autonomous networks

☆ News highlights

ⓘ Why it matters

Most operators will not reach Level 4 autonomy until 2030

Agentic AI will be critical for Level 4 autonomy and beyond

Data is abundant in the network but not AI-ready

A use-case driven approach to autonomous networks is needed – start small, scale smart

Going it alone is not an option to achieve autonomous networks

? Considerations for the year ahead

☆ News highlights from the last year

Autonomous networks achieved a high degree of mindshare among operators in 2025, with some large operators pushing for Level 4 validation through proof of concepts (PoCs) and domain-specific trials.

Multiple stakeholders are working to put the building blocks in place.

FEBRUARY

Nokia adds new agentic-AI capabilities

Nokia added agentic AI features to boost its portfolio of autonomous network products.

FEBRUARY

Deutsche Telekom launches its RAN Guardian network AI agent

Deutsche Telekom and Google announced a partnership to develop and launch RAN Guardian, which is a network AI agent for the RAN domain.

MARCH

Amdocs expands its AmAIz suite with new network agents

In partnership with Nvidia and AWS, Amdocs launched its network deployment agent to help operators with network planning.

MARCH

Industry leaders launch "L4 is ON" autonomous networks initiative

TM Forum, Huawei, Telefónica, Orange and others announced a joint initiative to accelerate the evolution to Level 4 autonomous networks for the telecoms industry.

JUNE

China Mobile and Huawei win award for 'Dark NOC'

China Mobile and Huawei won the TM Forum Excellence Award for their end-to-end autonomous network operation centre ('Dark NOC'), with limited human control and high degrees of cross-domain automation.

SEPTEMBER

AIS Thailand achieves milestone transition to Level 4 autonomous networks

AIS Thailand announced that its network has achieved Level 4 autonomy in several operational domains. The deployment focuses on three high-value AI agents designed to eliminate network downtime and optimise energy efficiency across its nationwide 5G infrastructure.

OCTOBER

SoftBank Japan launches large telecoms model

SoftBank Japan has launched a large telecoms model (LTM), based on a homegrown LLM called Sarashima. This will be used to train AI with Japanese characteristics for the local market.

OCTOBER

DNB and Ericsson achieve world-first Level 4 validation

Digital Nasional Berhad (DNB) in Malaysia and Ericsson achieved a world-first Level 4 autonomous network certification from TM Forum.

Source Company press releases

Why it matters in 2026

Operators need to accelerate the shift to intent-driven operations

Network autonomy is an imperative in 2026

Opex reduction efforts must move beyond incremental automation. Most network automation efforts have been siloed, so opex reductions have not achieved desired levels. Operators need to shift to cross-domain efforts that will deliver real outcomes.

Business as usual is no longer an option. Reducing opex and making it consistent and predictable is a huge driver for operator investments. However, reducing complexity and overheads in network operations is quickly becoming an imperative.

Operators need building blocks to evolve to autonomous networks

A base layer of network AI-ready data is essential. Operators have made progress centralising network data in data lakes, but data streams are still fragmented – and not enough is being done with the data. Available network data is also not AI-ready but needs to be.

Operators look to digital twins. Digital twins are being evaluated to test scenarios where agents interact, negotiate and execute against higher-level intents.

Agentic AI is coming but is not yet prime time

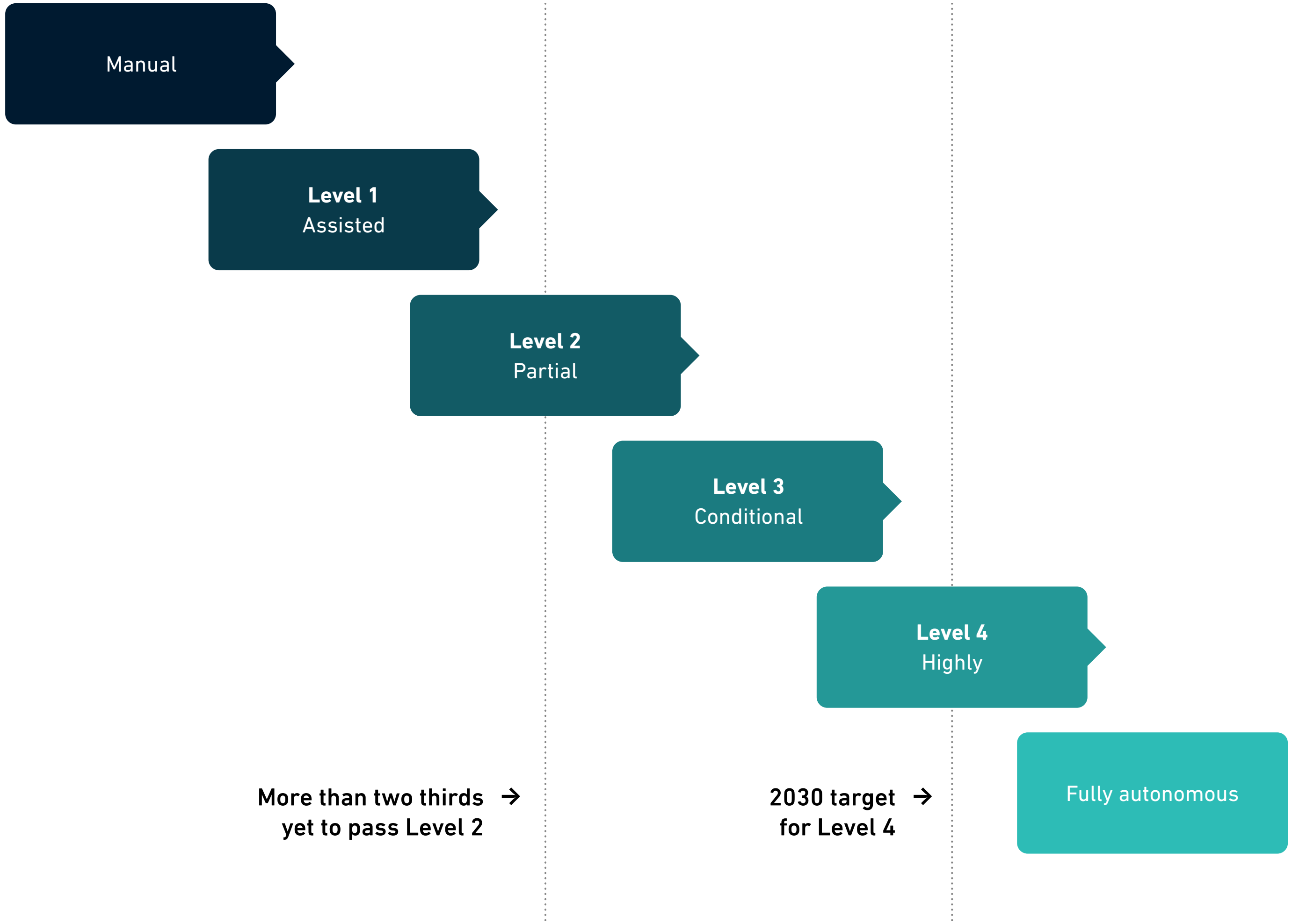
Agents as the bridge between business intent and network operations. While agentic AI in the telecoms network is just beginning, operators are increasingly cognizant of the technology's potential to be the engine that converts high-level intent into executable instructions for the network.

Agents build on efforts by operators towards telco-specific models. For agents to succeed, they must be able to draw on a pool of telco domain knowledge. As a result, many operators are investing in or developing foundation models in-house.

Most operators will not reach Level 4 autonomy until 2030

- **Stuck in a rut.** More than two thirds of operators have still not progressed past Level 2 autonomy, which indicates partial autonomy only. This maturity level is characterised by domain-specific automation efforts but largely reactive, incident-driven operations.
- **Level 4 PoCs increased in 2025.** A select number of operators showcased Level 4 autonomy as a PoC and invested in scaling to Level 4.
- **2030 remains the target for Level 4.** Most operators indicate their target for achieving Level 4 autonomy is 2030. This would be a paradigm shift to declarative, intent-driven models and proactive operations.

Operator progress on autonomy



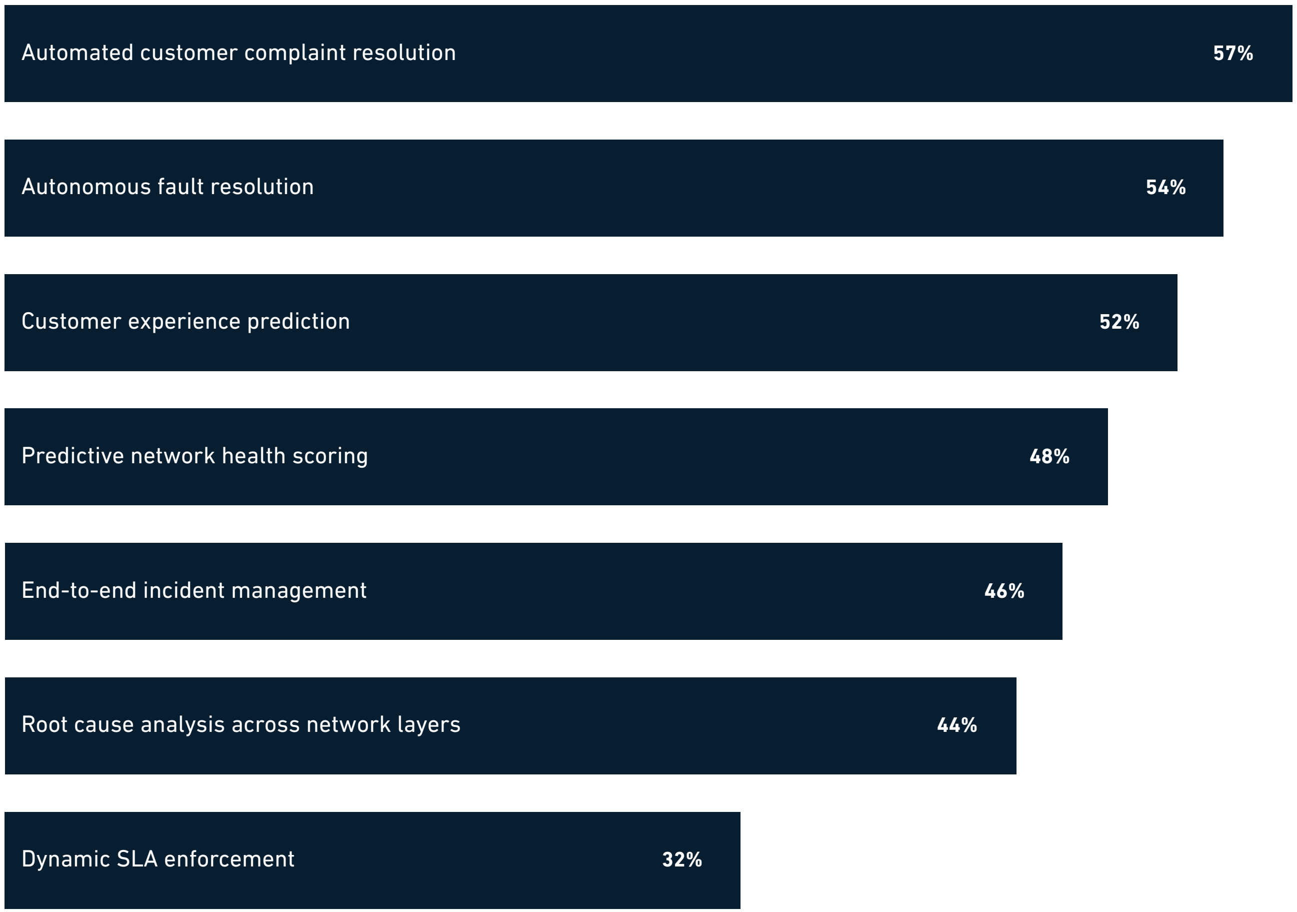
Source GSMA Intelligence

Agentic AI will be critical for Level 4 autonomy and beyond

- **Agents will be the 'foot soldiers' executing on declared intent from above.** Real autonomy in the network means a smooth flow of information and instructions that translate high-level strategic and business intent into rapid execution. With the help of a clearly defined network ontology, AI agents will provide the crucial bridging function to enable this transformation.
- **Agents must be embedded into telco operations, not bolted on.** Agents must be designed with telco domain expertise; otherwise, the fit will be poor and costly. This requires integration with telco-specific models, which are well versed in terminology and taxonomy so they can bridge both new and legacy systems.
- **Customer experience and network management rank high among agentic AI use cases.** Operators are already keenly evaluating use cases for agentic AI. Fault resolution, incident reporting and management, and root cause analysis are all leading use cases besides resolving customer complaints.

Areas where agentic AI would be most valuable: not just complaint resolution

In which areas/use cases would agentic AI be the most valuable to your operations? Percentage of operators



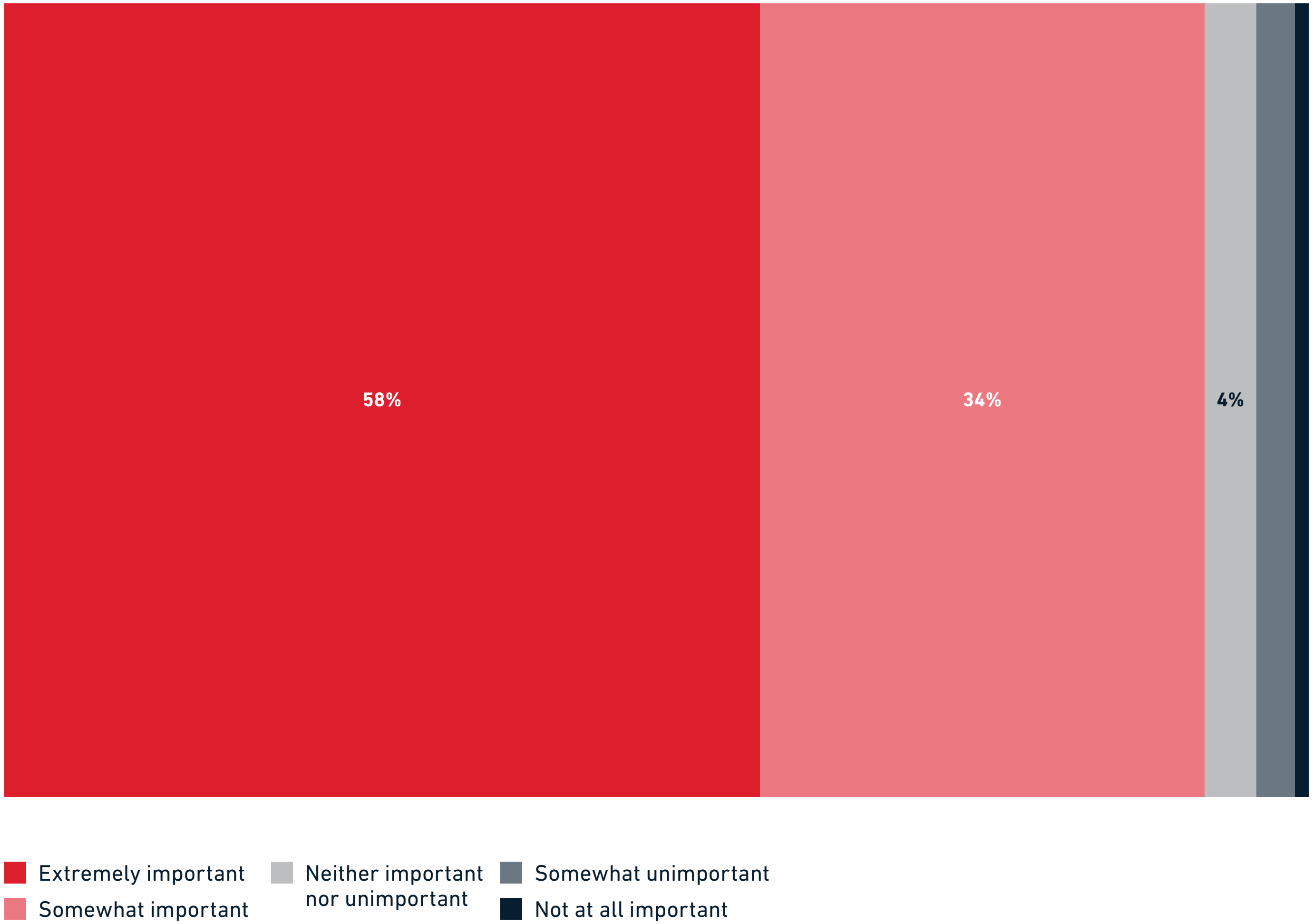
Source GSMA Intelligence Operators in Focus Service Assurance Operator Survey 2025

Data is abundant in the network but not AI-ready

- **Data quality is essential for real autonomy.** Many operators have reams of network data and telemetry available to them and have begun the process of centralising the data. However, it is not always in a usable format. Data quality must be a priority, through cleanup, consolidation of inventories and other data sources.
- **Build a horizontal data model.** It is crucial for data streams to be set up across domains so they can be analysed centrally and actioned. Data ingestion will ideally be set up to be use-case driven, as opposed to generic and continuous.
- **The data layer must be easily accessible by the AI telco platform player to create real intelligence.** Operators are already investing in and deploying telco-specific AI models that network data and telemetry will feed into. This data should be easily accessible. Strong governance policies should be in place too.

Real-time data is key to automating network operations

How important is it to access real-time data for automating network operations? Percentage of operators



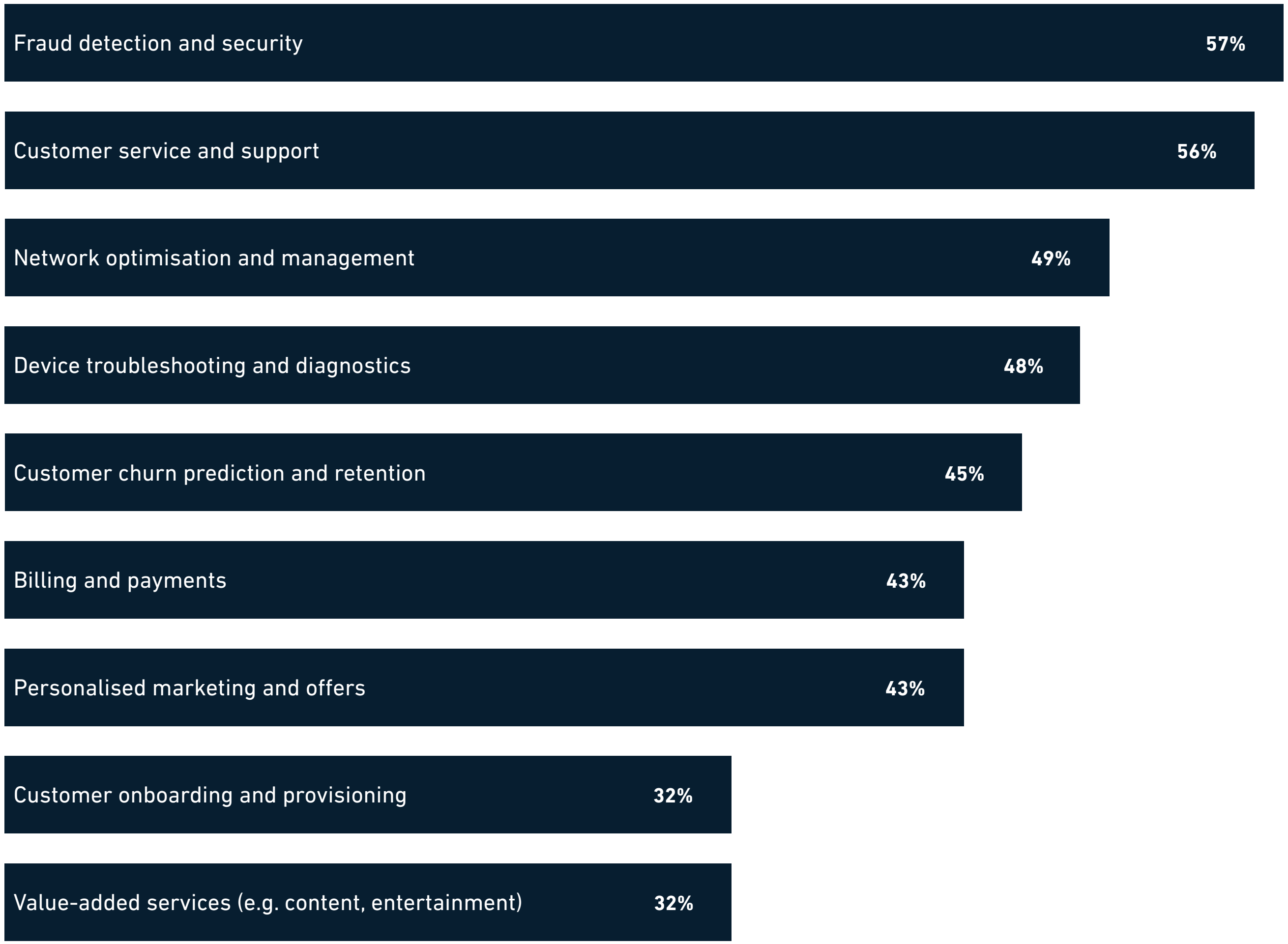
Source GSMA Intelligence Operators in Focus Service Assurance Operator Survey 2025

A use-case driven approach to autonomous networks is needed – start small, scale smart

- **Use cases are already numerous and span a range of domains.** Operators are keenly focused on the ability of agents to help them with a range of use cases, including network optimisation and management, device troubleshooting and billing.
- **Operators should start small.** This is not about doing PoCs alone but moving beyond them with a focused and incremental approach to deploying agentic AI that is use-case driven. Once the installed agent has been validated, the next step is to scale the use case across the network and then add new use cases.
- **Digital twins will help operators scale smartly.** There is a trust deficit and inherent resistance from conservative telecoms engineering teams to attempt big-ticket changes. Instead, a digital twin can help with the testing and validation of new scenarios before wider rollout, as well as help train the AI models on top of the data layers.

Agentic AI implementation is being planned across a range of processes

In which processes have you started to plan implementation of agentic AI?
Percentage of operators



Source GSMA Intelligence Operators in Focus Service Assurance Operator Survey 2025

Going it alone is not an option to achieve autonomous networks

- **The AI tech stack is complex and varied, requiring different skillsets.** Operators are capable of – and already investing in – building out their own AI tech stacks. However, in many cases, they will need to build a reliable ecosystem of partners who can plug gaps and accelerate transformation.
- **Internal skilling and a new cultural mindset are important for AI transformation.** One of the biggest challenges for operators is the lack of internal skills for AI and nurturing a fast-moving culture that will thrive on the transformation. Some large operators are investing heavily in this area, but others must decide quickly whether to do this in-house or partner.
- **It will take a village.** Achieving a high level of autonomous networks will require collaboration between operators, industry stakeholders, vendors suppliers and others.

AI ecosystem presence in telco AI

Based on share of telco AI deployments where the company is a supplier or partner. Deployments are only those in the public domain, so this is a proxy for ecosystem presence rather than the true underlying picture.

Large operators (top 250)

Category	Rank 1	Rank 2	Rank 3
GPU providers	Nvidia	AMD	Intel
Hyperscalers	Google	Microsoft	AWS
Foundational models	Perplexity	OpenAI	DeepSeek

Small and medium-sized operators (250–700)

Category	Rank 1	Rank 2	Rank 3
GPU providers	Nvidia	Intel	AMD
Hyperscalers	Microsoft	AWS	Google
Foundational models	OpenAI	Perplexity	Snowflake

Source GSMA Intelligence

Considerations for the year ahead

Flattening the network

- **Breaking down silos for end-to-end visibility.** Operators have already begun this task but need to accelerate the process in 2026. End-to-end visibility is only possible with telemetry and network data from across domains.
- **Data quality and governance.** Inventory consolidation and transparency need to be achieved in parallel with strong data governance policies. This is crucial for training the AI models and producing actionable intelligence.

Agents of the world, unite!

- **Agent development will accelerate.** Operators are already investing in and deploying agents that are typically domain-specific. Most efforts are at an early stage, but more should come through in 2026.
- **Agents will all report into a master.** As new agents are developed for different domains and functions, they will report into a master, who will act as a translator between business intent and the network, and as an orchestrator to execute on intent.

Return on investment to drive evolution to autonomous networks

- **Autonomous network evolution should be use-case driven.** Operators have already identified key use cases where agentic AI can help automate processes, improve mean time to response and others. However, they must be selective and choose use cases with the fastest returns for scaling.
- **Overcoming internal trust deficit is key.** Operators can consider deploying digital twins to help them validate scenarios before deployment.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AI and devices

New models, new value?

AI and devices

☆ News highlights

ⓘ Why it matters

Considerations for the year ahead

☆ News highlights from the last year

The rise of on-device AI and AI-specific devices is driving demand for more capable hardware. As device makers and other consumer AI ecosystem players reassess the on-device/cloud processing mix to optimise profitability and user experience, operators will need to focus on the impact on data volumes and network-quality demands. Ultimately, consumers will judge AI by the tangible value it delivers, not its underlying compute model.

MARCH

Honor showcases AiMAGE based on a hybrid AI architecture

Honor announced AiMAGE imaging technology for mobile photography, which is powered by AI Kernel, a solution based on a hybrid AI architecture involving on-device and cloud processing.

MAY

TDK Electronics plans next-generation battery tech

TDK announced plans to introduce the fourth generation of its silicon anode battery technology in 2026 with a view to targeting AI consumer devices – primarily AI smartphones, which are increasing in share.

JULY

Samsung aims to significantly expand Galaxy AI in its consumer devices

Samsung announced it aimed to expand Galaxy AI features to more than 400 million devices by the end of 2025. This reflects the push from device OEMs to establish advanced AI capabilities among the next big purchase differentiators.

DECEMBER

Google and Xreal partnership sees the launch of new Android XR-based AR glasses

Google and Xreal, under Project Aura, unveiled the first AR glasses built on Android XR, Google's new XR OS. This has been designed to have native Gemini integration, the tech giant's advanced AI technology.

DECEMBER

Samsung's new DRAM wins innovation award

As on-device AI advances, the need for next-generation device working memory is growing. Samsung's new LPDDR6 DRAM, built on the JEDEC next-generation interface, is positioned for high-performance, on-device AI.

DECEMBER

Research commissioned by Nokia in Europe shows industry consensus that connectivity must evolve to support AI growth

According to the research, concern over network infrastructure and connectivity is widespread: 78% of enterprise executives are worried about Europe's ability to provide the connectivity that AI needs, with 11% identifying as extremely concerned.

DECEMBER

Mobvoi raising funds for AI note-taking earbuds

Mobvoi, which is best known among consumers for its smartwatches, is raising funds via Kickstarter to launch TicNote Pods, which it claims are the world's first 4G-connected AI note-taking earbuds.

DECEMBER

Looki L1 launches in China, following its introduction to global markets earlier in 2025

The launch comes as interest in AI-specific devices grows. The Looki L1 records continuously in a hands-free format and uses AI to organise the captured material. It also provides features such as AI-generated vlogs, AI-based search functionality, and automated summaries of user activity through Looki AI.

Source Company press releases

Why it matters in 2026

Advanced AI integration is reshaping the consumer device landscape

Show me the money

Investor patience wears thin. Colossal amounts of money are being poured into advanced AI (such as generative AI). As recent stock market moves have shown, monetisation is becoming increasingly urgent. Consumers are using advanced AI tools in rising numbers, but delivering returns will require a sharp focus on productisation and delivering real utility to consumers.

Compute of small things. Led by (flagship) smartphones, premium consumer devices of all types are increasingly flaunting powerful on-device AI hardware specs. For advanced AI service providers, leveraging this compute will be increasingly important to help lower their inference costs.

We live in a world of agentic dreams

Taking the middle path. AI innovation is expected to continue at a significant pace in 2026, with advances in AI agents a big theme. Combined with other factors, hybrid AI compute (between on-device and cloud) is likely to become the norm. Ecosystem players such as device OEMs, chip makers, advanced AI service providers, cloud providers and operators will need to collaborate closely on this hybrid orchestration to help deliver a transformative consumer AI experience.

AI progress demands more from on-device. AI's advancing capabilities, including the release of more latency-sensitive features, will likely push OEMs harder into incorporating device upgrades beyond AI accelerators, with implications for device ASPs, device positioning, competitive strategy and more.

The AI-specific consumer device category emerges

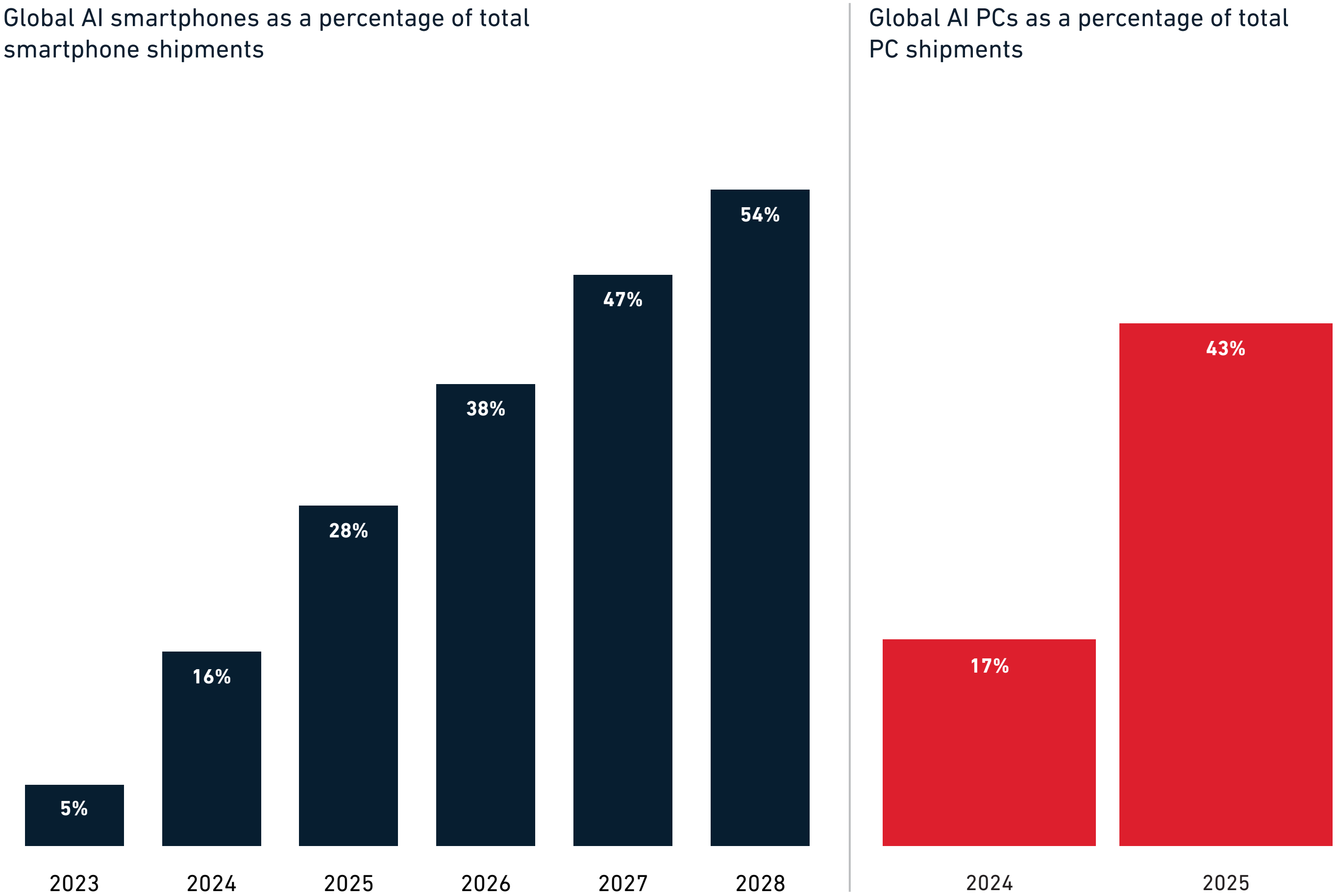
AI as a core capability. So far, AI has generally been used to enhance device capabilities, such as better analysis of data captured by the device or optimisation of sound/video. New categories of device used specifically for their AI capabilities are emerging – for use cases such as lifelogging and transcription.

A nascent opportunity for operators. Some operators have started capitalising on consumer appetite for AI by bundling premium tiers of generative AI (genAI) applications with their services. These new devices represent an additional opportunity for bundling.

Momentum behind on-device AI is set to accelerate, but the future still looks hybrid

- **Benefits at the edge.** On-device AI should see increased momentum in 2026, driven by the benefits promised in areas such as compute cost, latency and security/privacy. Factors contributing to its rise include increasing proliferation of advanced AI-capable devices, advances in small language models, further releases of latency-sensitive advanced AI features, and a stronger push to lower total inference costs.
- **HAL 9000 still needs cloud.** Advances in AI capabilities (such as agentic AI, deep reasoning and the development of world models), combined with factors such as improving cost-per-performance for AI cloud compute and advances in mobile connectivity, point to a hybrid AI compute future calibrated between on-device and cloud, varying by use case.

Momentum behind on-device AI is in part reflected in the growing share of AI smartphones and AI PCs*



*The definition of AI-capable devices can be broad, but they are generally considered to have dedicated on-device AI hardware such as neural processing units (NPUs).

Source Statista

The rise of on-device AI will demand hardware developments beyond AI accelerator advances

- **Memory matters.** AI accelerator advances are expected to continue in 2026, including NPUs shifting to dynamic sparsity and realising faster NPU runtimes via the LiteRT QNN accelerator. Beyond AI accelerators, device working memory will be another important area of on-device interest. For example, GSMA Intelligence expects Turbo LPDDR5X and LPDDR6 to appear in more devices in 2026, and OEMs to start looking into LPW/LLM DRAM.
- **Advances in packaging, battery and more.** The on-device push should see consumer device chips increasingly implement heterogeneous integration using advanced techniques such as TSMC's SoIC and hybrid bonding. As AI capabilities advance (e.g. multimodality) and become more central to consumer device use and daily lives (raising demands such as always-on access), advances in battery technology will likely become increasingly necessary.

Device adaptation will be needed to handle AI advances

LPDDR5X versus LPDDR6 DRAM

Category	LPDDR5X	LPDDR6
Max data rate	10667 Mbps	14400 Mbps
Prefetch	16n/32n	12n/24n
Max density	32 GB	64 GB

Source Synopsys

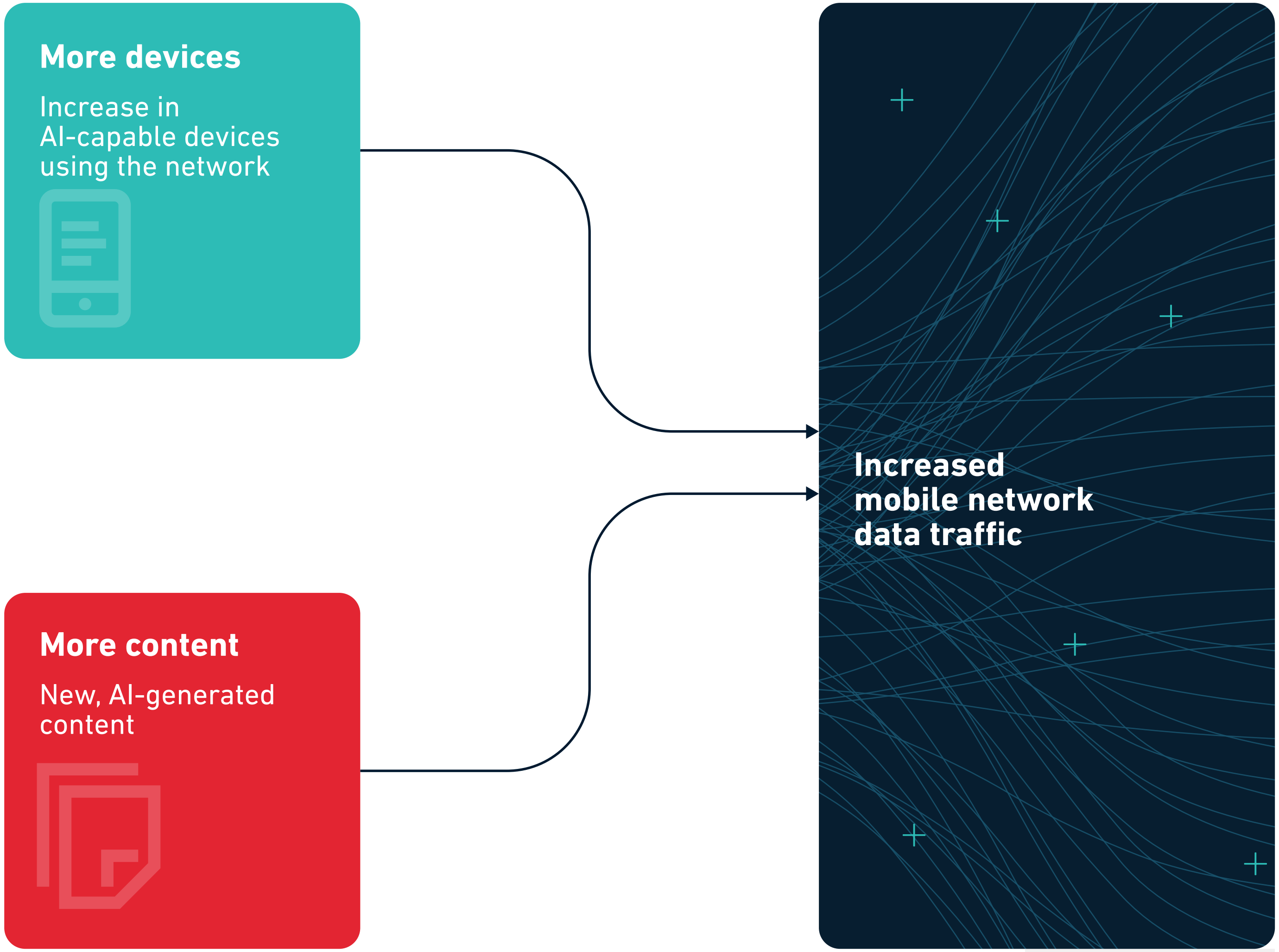
Hybrid bonding advantages

Source GSMA Intelligence

Operators need to monitor AI data traffic to quantify the potential impact

- **AI will generate additional data traffic.** The combination of more AI-capable devices and more AI-generated content is guaranteed to increase data traffic volumes.
- **Too early to quantify.** As many AI use cases are in the early-adoption phase or as-yet unknown, it is not possible to predict future AI data traffic volumes with any accuracy.
- **Monitoring current usage can help.** Understanding the impact of current AI usage on downstream and upstream data traffic enables operators to create potential scenarios.

AI will drive increased data traffic due to a combination of factors



Source GSMA Intelligence

AI-specific consumer devices are poised for take-off; operators can capitalise

- **AI-specific consumer devices emerge as a category.** Most consumer electronics manufacturers already use AI to enhance the capabilities of their devices. However, several players have recently launched devices built specifically for an AI function, such as transcription, with the service typically sold via a freemium subscription model.
- **Adoption of AI-specific devices to grow in 2026.** As more players enter the market and awareness increases, more consumers are set to try these devices.
- **An opportunity for operators.** Operators can capitalise on, and even drive, this anticipated growth by bundling the devices with their core services.

AI-specific consumer devices are emerging as a new category

AI-specific consumer devices

Device type	Examples of AI capabilities within the device	Examples of devices
Lifelogging	Auto-tagging; semantic search; real-time video optimisation; video highlights; contextual organisation	Looki L1, LUCI Pin + Hub
Lifelogging and transcription	Real-time transcription and summarisation; contextual memory; AI voice assistant	Bee Pioneer
Transcription	Real-time transcription and summarisation; contextual memory; AI translation	Plaud, TicNote Pods, Vocci

AI-enhanced consumer devices

Device type	Examples of AI capabilities within the device	Examples of devices
Smartwatch / fitness tracker	Health monitoring / predictive analytics; fitness coaching; AI voice assistant; fall and crash detection	Apple Watch Series 11, Samsung Galaxy Watch 8
Smart ring	Health monitoring / predictive analytics; fitness coaching; fall and crash detection	Muse Ring One, Oura Ring 4
Smart glasses / XR headset	Real-time translation; object/scene recognition; generative AI; gesture/eye tracking; AI voice assistant; adaptive content and personalisation	Apple Vision Pro, Meta Quest 3, Oakley Meta Vanguard, Xreal Project Aura

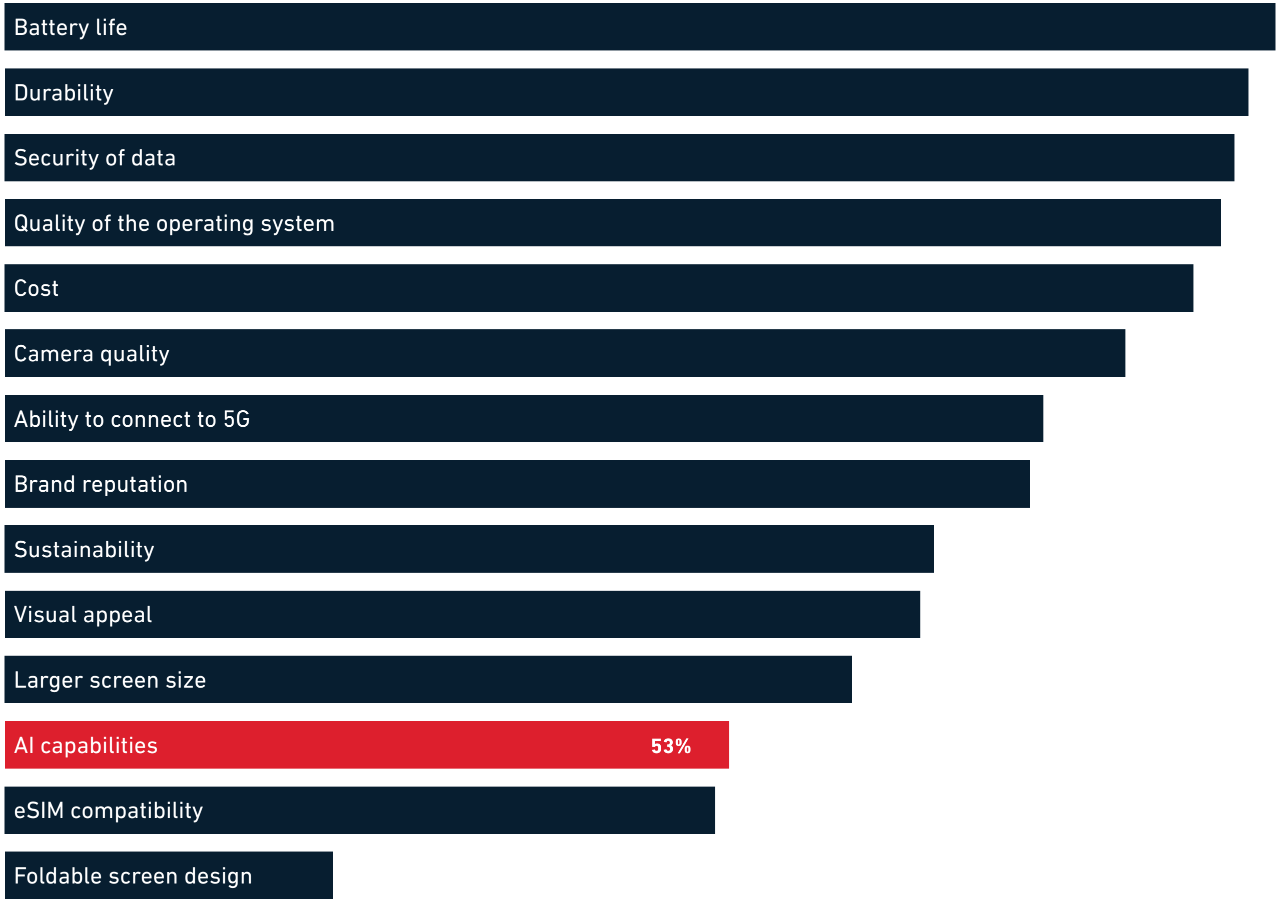
Source GSMA Intelligence

AI alone is not a solution; people need to feel real value

- **Hardware is good but software ate the world.** Across device types, flagship models are incorporating specialised hardware to facilitate advanced AI (e.g. NPUs). However, top AI specs are only the means to an end – that is, transforming consumers' digital experiences through both new and better, advanced AI-driven, software experiences. In 2026, OEMs will need to up their game on this front.
- **A multi-faceted effort.** OEMs will need to push on various vectors such as a revamped OS natively interweaving advanced AI capabilities, accelerating third-party partnerships to expand advanced AI services offerings, and leveraging 5G advances to optimise consumer experience of frontier AI features such as multimodality.

AI capabilities are growing in importance; delivering consumers real utility should help sustain momentum

Percentage of consumers who find a feature somewhat or very important. Base is smartphone users who will replace their smartphone. Aggregate figures across 12 countries surveyed.



Source GSMA Intelligence Consumers in Focus Research: Global Consumer Survey August 2025

Considerations for the year ahead

For device OEMs

- **Moving beyond flagship.** As is the case with most new technologies, on-device AI capabilities have landed in flagship consumer devices first. However, with rising advanced AI use across consumer segments, bringing on-device capabilities downstream will be a revenue and competitive imperative for device OEMs. They will also need to contend with the rising costs of certain on-device enabling components such as device memory. Scale benefits could favour the leading global OEMs in this balancing act.
- **Clarity on use cases.** Manufacturers of AI-specific consumer devices need to highlight how they can address pain points in day-to-day lives, offering intuitive solutions that deliver real value to pave the way for effective monetisation.

For advanced AI providers

- **Full disclosure.** Advanced AI (e.g. genAI) providers, working in conjunction with ecosystem partners such as device OEMs, should ensure users are provided full, upfront disclosure on the key limitations of their AI services, in terms of accuracy, consistency and hallucinations, for example. Consumers can then engage with full knowledge of what to expect, which should help improve satisfaction rates.
- **Going beyond an app.** The emergence of AI-specific consumer devices enables AI providers to offer ‘always on’ AI directly to end users without relying on an app running on an intermediary device, significantly increasing the reach of AI capabilities. Identifying the right partners and form factors will be key to success.

For operators

- **AI’s impact on data traffic.** To prepare network dimensioning scenarios, operators need to measure the amount of AI-generated traffic to have a current baseline. Various elements will need to be factored into the scenarios, including how AI is implemented (e.g. on-device versus cloud) and potential reductions in traffic due to AI optimisation of bandwidth-intensive traffic such as video.
- **A 5G monetisation fillip?** AI advances, particularly in multimodal and agentic AI, present an attractive opportunity for operators to support the monetisation of 5G standalone (5G SA). Operators should collaborate closely with other AI ecosystem players, such as AI service providers, to unleash the full spectrum of frontier AI capabilities outdoors.

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GLOBAL MOBILE TRENDS

5G innovation

The road to 6G

GLOBAL MOBILE TRENDS

5G innovation

☆ News highlights

ⓘ Why it matters

Revenue growth improves as 5G monetisation strategies mature

5G SA rollouts continue to lag expectations

The 5G SA business case is still taking shape

5G-Advanced activity spreads beyond China

The mobile industry starts to sketch out the 6G era

Considerations for the year ahead

☆ News highlights from the last year

New monetisation opportunities are emerging across several regions through 5G standalone (SA) and 5G-Advanced deployments. These upgrades also act as an important bridge to 6G, as discussions around the direction of future mobile networks start to build.

FEBRUARY

DNB turns on 5G-Advanced

Digital Nasional Berhad (DNB), the state-backed entity operating Malaysia's first wholesale 5G network, deployed Ericsson's 5G-Advanced technology on its nationwide infrastructure.

MAY

e& launches 5G network slicing proposition

e& UAE launched MENA's first commercial 5G SA network slicing product for business customers over its network. The operator cited manufacturers and port operators as potential customers.

JUNE

MIIT details China's 5G-Advanced progress

The MIIT report said China Mobile, China Unicom and China Telecom have rolled out 5G-Advanced networks in more than 300 cities, with over 10 million users signed up so far.

JULY

Telstra deploys new 5G-Advanced feature

Telstra partnered with Ericsson to deploy the vendor's automated carrier aggregation technology across more than half its live commercial 5G-Advanced sites in Sydney, Australia. The feature automates the selection of the most suitable carrier combinations in real time, based on current network conditions.

AUGUST

T-Mobile US launches SuperMobile proposition

SuperMobile combines nationwide 5G SA connectivity with network slicing, built-in security and T-Satellite in a single plan. Delta Air Lines and Axis Energy Services were cited as early customers.

OCTOBER

AT&T announces nationwide 5G SA deployment

AT&T said millions of customers are already using its nationwide 5G SA network. The operator will expand availability to more customers "as device support and provisioning allow".

NOVEMBER

EE unveils new 5G SA target

EE set a new goal to cover 99% of the UK population with 5G SA by the end of its 2030 financial year, claiming its target is four years ahead of rival operators' plans.

NOVEMBER

EU spectrum group makes upper 6 GHz recommendation

The European Commission's Radio Spectrum Policy Group (RSPG) recommended that either 665 MHz or 700 MHz of spectrum in the 6.425–7.250 GHz range be allocated for mobile use.

Source Company press releases

Why it matters in 2026

Moving from rollout to returns

5G moves firmly into the mainstream

5G launches continue at pace. More than 350 operators have launched mobile 5G, while more than 200 operators have launched 5G fixed wireless access (FWA). However, 5G is not yet completely rolled out, with 116 operators from 74 markets still in the planning stages of launching the technology.

5G adoption accelerates. There are now almost 2.8 billion 5G connections worldwide, equivalent to more than 30% of global mobile connections. This figure is expected to surpass 55% by the end of 2030.

5G SA and 5G-Advanced drive network spend

Capex set to grow. Mobile capex is projected to rise from 2026 onwards, as 5G goes live in more countries and investments in 5G SA and 5G-Advanced ramp up. This opens up opportunities for suppliers to break into new accounts.

Operators keep an eye on capex intensity. Capex-to-revenue ratios hit 20% in the initial phase of 5G deployments. Although capex is forecast to rise in each of the next few years, capex as a percentage of revenue is expected to be flat, reflecting operators' desire for cost control.

6G developments begin to gather pace

Evolution, not revolution. With many operators struggling to monetise 5G, calls from operators for 6G to be an evolution of 5G have grown louder in the last year.

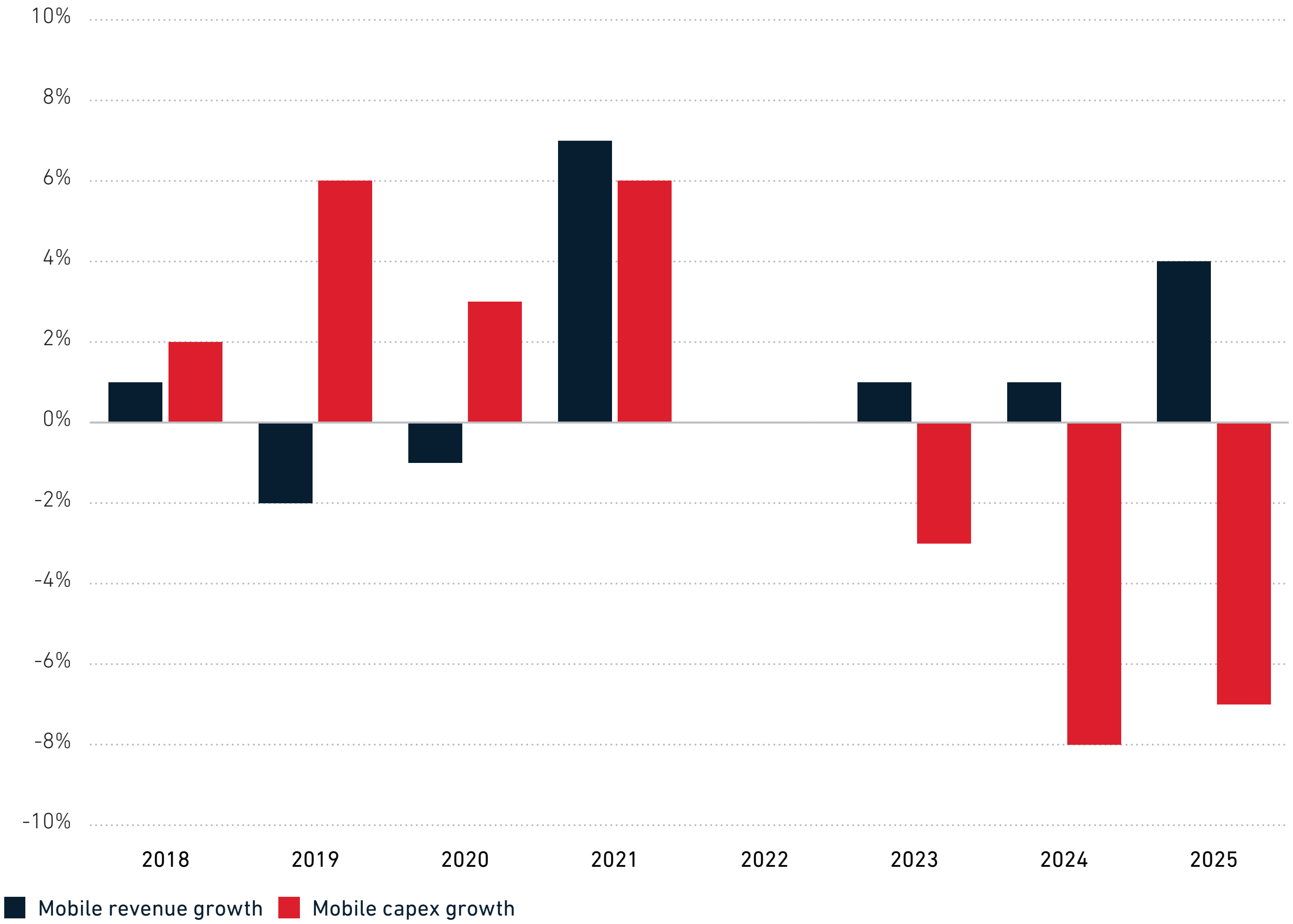
6 GHz for 6G. The recent announcements from the European Commission's Radio Spectrum Policy Group follow moves in other regions to apportion 6 GHz spectrum for mobile use. The spectrum is regarded as important in advancing the development of 5G services and facilitating the deployment of 6G.

Revenue growth improves as 5G monetisation strategies mature

- **Signs of recovery.** Mobile revenue growth has been sluggish for much of the 5G era, barely keeping up with inflation in many countries. However, 2025 saw improved revenue performance alongside a reduction in capex upon the completion of initial 5G rollouts.
- **Striking the right balance.** Much of the discussion around 5G's revenue potential has focused on opportunities in the enterprise sector. However, 5G B2C monetisation is equally crucial, with the consumer segment accounting for around 70% of revenues for most operators. Speed-based tariffs and scenario-specific service plans continue to gain traction as operators develop new ways to meet customer needs.

Green shoots finally start to emerge

Year-on-year growth in global mobile revenue and capex



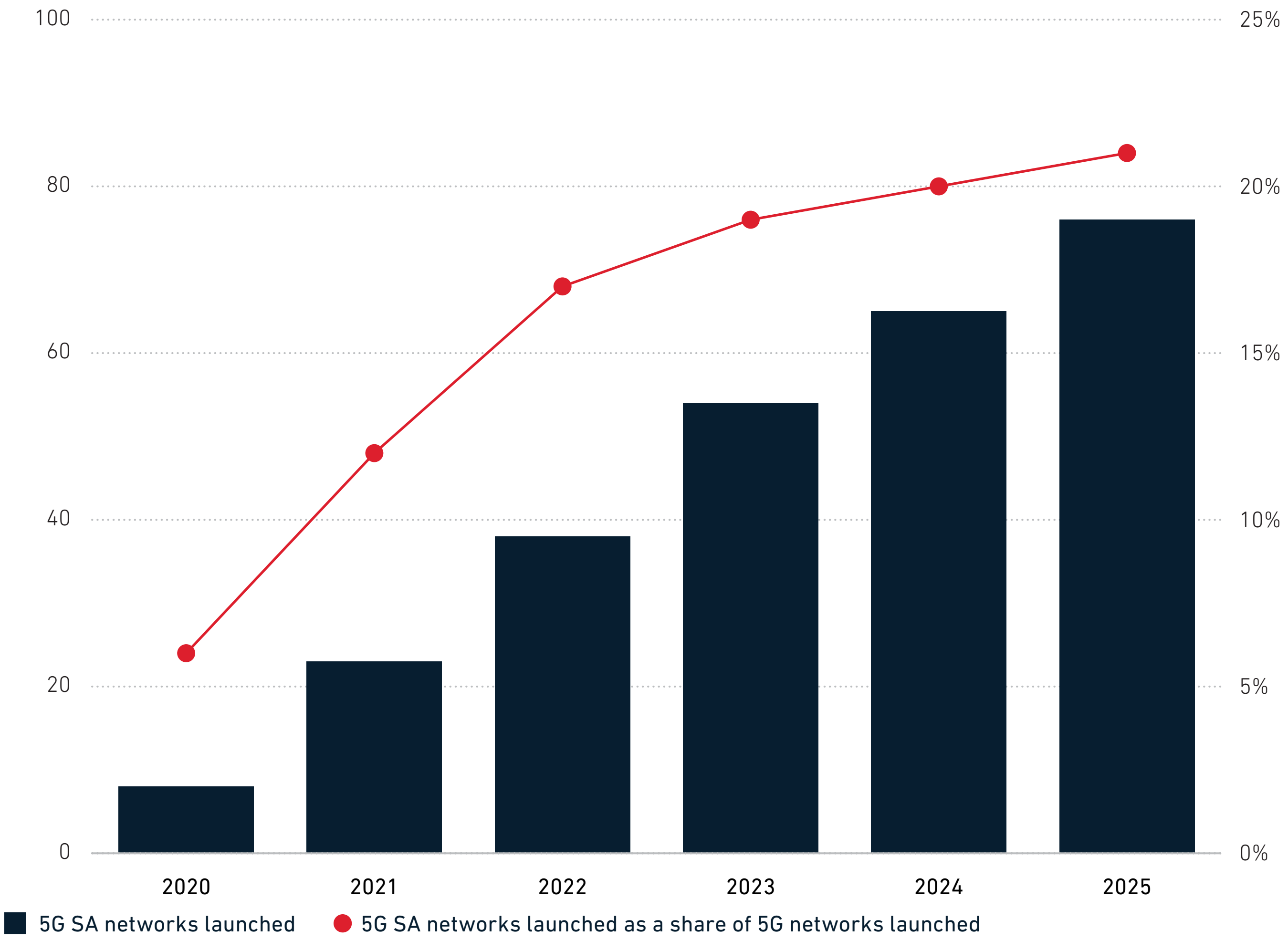
Source GSMA Intelligence

5G SA rollouts continue to lag expectations

- **5G SA deployments continue at a modest pace.** As of December 2025, 76 operators had launched 5G SA. Although this is double the 2022 figure, it still only represents just over 20% of operators with commercial 5G networks.
- **Top-level figures conceal mature regions.** In the GCC states, for example, nearly half of operators with commercial 5G networks have deployed 5G SA, while the equivalent figure in developed Asia Pacific and the EU5 (France, Germany, Italy, Spain and the UK) is around 65%. In addition, all national operators in China and the US have launched 5G SA, including several nationwide deployments.

No S-curve in sight for 5G SA

Number of operators that have launched 5G SA



Source GSMA Intelligence

The 5G SA business case is still taking shape

- **Device support remains a concern.** While most newer devices support 5G SA, many older devices are only compatible with non-standalone (NSA). In addition, there remains limited support for 5G SA in IoT modules.
- **Operators question 5G SA returns.** The high cost and technical complexity in deploying 5G SA means operators want to be sure there are clear use cases and monetisation opportunities from deploying the technology.
- **Reasons to upgrade.** A GSMA Intelligence report identified content streaming with high upload, live broadcast, AR/VR and FWA as key use cases for unlocking 5G SA revenues. 5G SA upgrades also prepare networks for 6G, spreading capex over a longer period.

Operators view commercial (not technical) factors as the main barrier to 5G SA progress

Which factors would accelerate the deployment of across your 5G SA network? Percentages denote the share of operators that listed each barrier in their top two factors

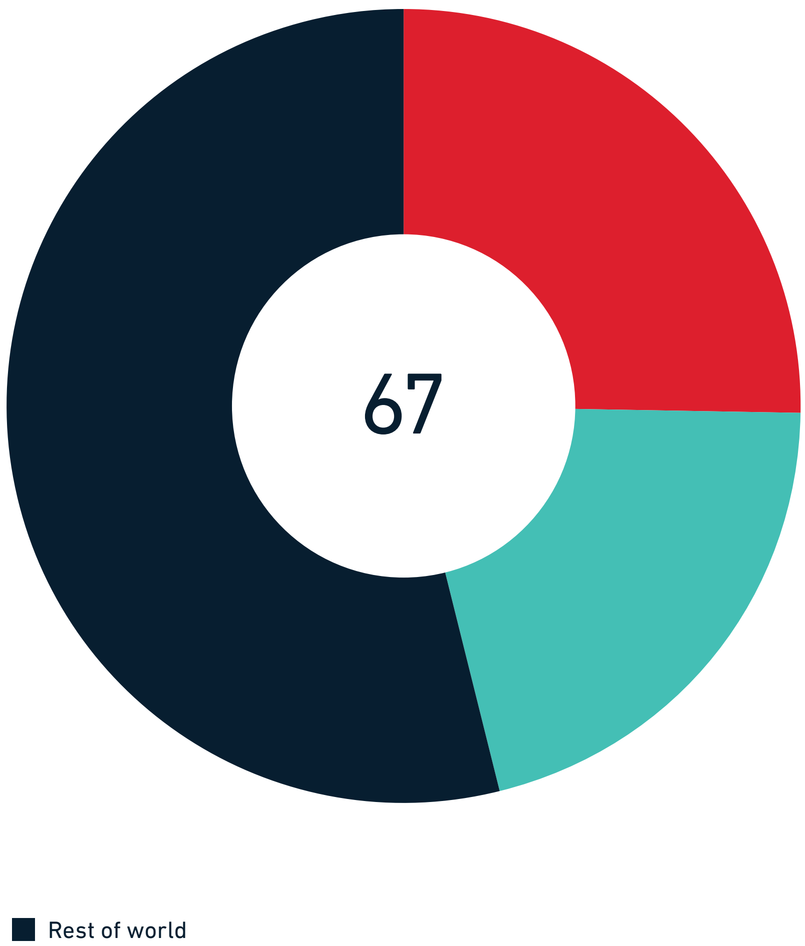
Source GSMA Intelligence Operators in Focus: Network Transformation Survey 2025

5G-Advanced activity spreads beyond China

- **Momentum builds.** Ten operators have launched commercial 5G-Advanced networks, while another 57 have announced plans to launch, as of December 2025.
- **China sets the pace.** By mid-2025, 5G-Advanced networks in China covered more than 300 cities and over 30 provinces, with more than 10 million subscribers already on 5G-Advanced packages.
- **MENA takes the lead.** Operators in Kuwait and UAE have launched 5G-Advanced, communicating the network upgrade to their customers using new 5G branding (5G-Advanced, 5G+ or 5.5G), while promoting the benefits of the technology for video streaming and gaming.

Interest in 5G-Advanced has grown rapidly in MENA and Asia Pacific

Proportion of total number of operators that have launched or announced plans to launch 5G-Advanced, by region



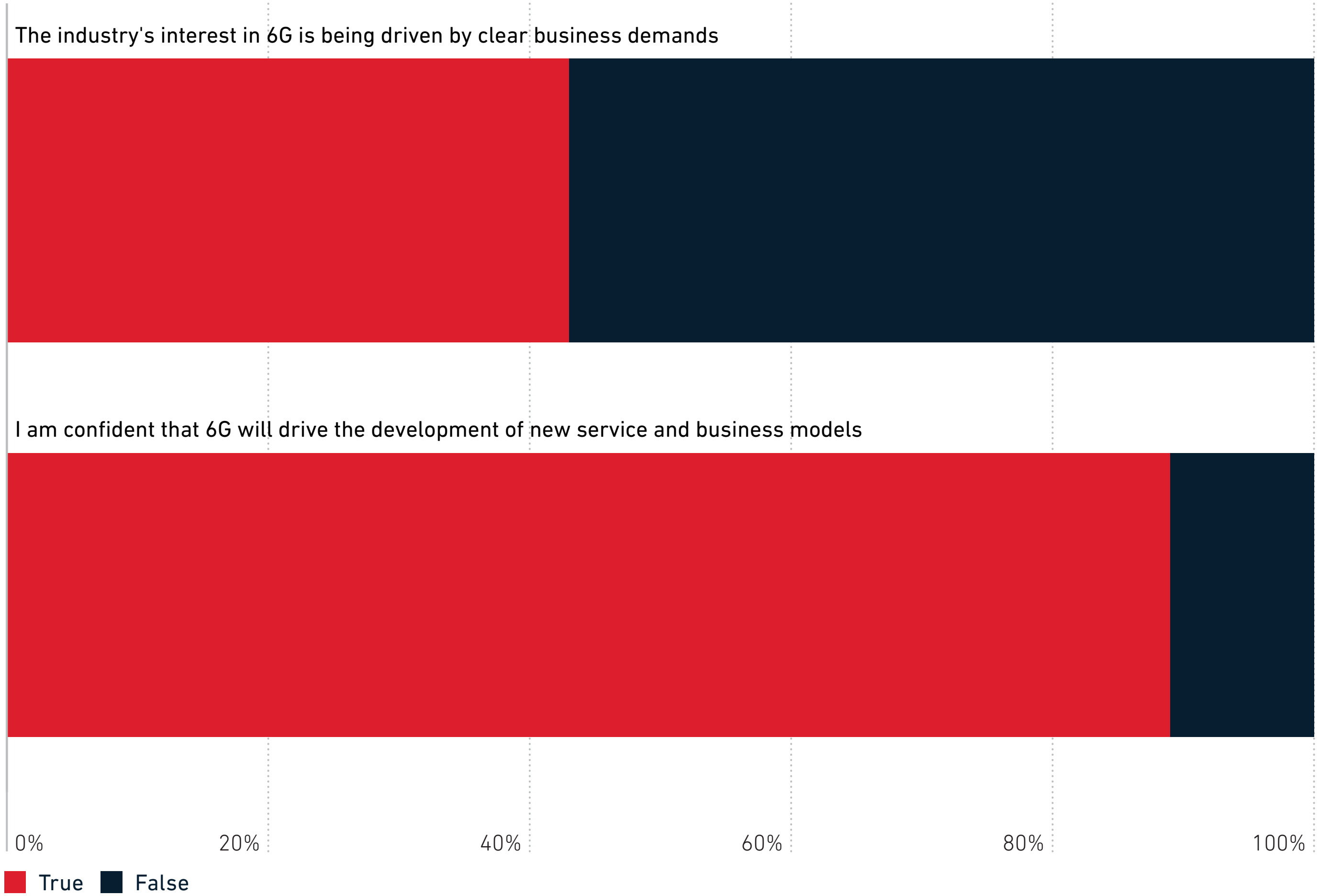
Source GSMA Intelligence

The mobile industry starts to sketch out the 6G era

- **Mobile tech tends to work in 10-year innovation cycles.** This means that even though operators' monetisation efforts are focused on 5G, 6G R&D is taking shape, working back from commercial launches likely around 2030.
- **Operator optimism.** New business models and revenue opportunities are a perennial industry focal point. It is therefore unsurprising that most operators expect future tech generations will support them.
- **Lessons from 5G.** Despite the positivity on new service and business models, less than half of operators believe the mobile industry's interest in 6G is driven by clear business demands. This suggests operators need to play a more active role in the development of 6G to ensure it delivers a return on investment.

Operators expect 6G to bring new business models but are yet to see a link to business demands

Please evaluate each of the following statements regarding 6G networks and network development



Source GSMA Intelligence Operators in Focus: Network Transformation Survey 2025

Considerations for the year ahead

Operators showcase network slicing potential

- **Slicing gets real.** Network slicing has long been viewed as crucial to the 5G SA business case. Recent slicing announcements, such as T-Mobile US's SuperMobile and Edge Control propositions, show how the technology can unlock new revenue opportunities.
- **Doubts remain.** Around a third of operators surveyed in the GSMA Intelligence Network Transformation Survey selected technology maturity as the top obstacle to deploying network slicing. Concerns around the technology's maturity should ease as deployments gather pace.

IoT and positioning capture operator interest

- **IoT focus.** In the GSMA Intelligence Network Transformation Survey, operators in every region, apart from Latin America, ranked ambient IoT or RedCap IoT in their top-three beyond-5G use cases, showing the continued focus on developing IoT solutions to drive revenue growth.
- **In pole position.** Operators in Asia Pacific selected integrated sensing and communications (ISAC) as their top beyond-5G use case, aligning with operators' push to develop new B2B business models. As of 2026, however, they are bolstered by an interest in tracking devices for security purposes.

6G innovation comes into view

- **New hardware.** Discussions around limiting hardware refreshes have focused on core, baseband and air interface changes. However, the addition of new spectrum bands (e.g. 6 GHz) almost always requires new network equipment, including radios and antennas.
- **New software.** Many 5G-Advanced features have been delivered through software upgrades. This trend is set to continue as we enter the 6G era and the industry shifts towards continuously updatable, software-based networks.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☆ News highlights

ⓘ Why it matters

Culture pivot: operators look to be the digital transformation partners of enterprises

AI leads in digital transformation spend, followed by 5G and IoT data analytics

5G emerges as an essential backbone in mission-critical industries

In enterprise AI, there is a clear trend towards the edge

5G-Advanced sees early uptake in robotic systems and humanoids

Considerations for the year ahead

☆ News highlights from the last year

Enterprise 5G momentum accelerated in 2025, driven by growing needs for secure connectivity and the adoption of network slicing to support industry-specific requirements. The ecosystem saw further adoption of private 5G in defence and mission-critical applications.

JANUARY

Verizon unveils AI strategy to power next-generation AI demands

Verizon's collaboration with Nvidia brings together the operator's private 5G network and private multi-access edge computing (MEC) with the Nvidia AI Enterprise Platform and Nvidia NIM microservices to deliver AI services on-premises for enterprises.

FEBRUARY

Finland expands national critical communications network

Erillisverkot is Finland's national critical communications company. It has been working with Ericsson and partners to build Virve 2 – a mission-critical mobile network for first responders that features private network solutions.

FEBRUARY

Thales, Druid and Microamp present military-grade solution

The solution integrates Microamp's advanced 5G mmWave CellBox Air gNodeB with Thales' CN6140 encryptors, along with Druid Software's Raemis private core network platform.

MAY

Nokia offers tactical private 5G in US Marine Corps

Nokia delivered its Banshee tactical private wireless solutions to enhance battlefield connectivity in support of the US Marine Corps Tactical Systems Support Activity.

JULY

Du launches the National Hypercloud sovereign cloud

In partnership with Oracle, Du announced the National Hypercloud, which will be tailored to meet the needs of government agencies and local market companies in terms of security and data residence.

AUGUST

ZTE showcases 5G-Advanced at Shanghai's robotics fair

At the World Artificial Intelligence Conference 2025, ZTE showcased its 5G-Advanced-enabled service, 5G-A EasyOn·Robot private network. ZTE partnered with robotics OEMs and showcased multi-robot coordination systems for real-time voice Q&A, live performances and retail operations.

AUGUST

Telit validates its 5G IoT modules with Nvidia's Jetson Thor platform, eyeing robotics application support

Telit Cinterion unveiled 5G RedCap modules such as the FE920C04 and is concluding validation testing with Nvidia's Jetson Thor platform. This will allow Telit's modules to integrate with – and offer high-performance connectivity support for – robotics and other autonomous and mobile AI systems.

DECEMBER

Globalstar announces Skydio test with XCOM RAN

Globalstar announced that it had successfully completed a joint trial with Skydio. The companies validated compatibility between the Skydio X10 and Globalstar's licensed Band n53 spectrum, as well as Globalstar's XCOM RAN private 5G platform.

Source Company press releases

Why it matters in 2026

Monetisation will be achieved with the right business models

5G is far from a done deal in the enterprise segment

A diverse portfolio of services. Rather than a single solution, 5G for enterprises is a suite of offerings tailored to different sectors and use cases, ranging from established services such as private networks to emerging capabilities such as network slicing and 5G non-terrestrial networks (NTNs).

Near-term opportunities and long-term horizon. While full maturity may be more than five years away, there are immediate opportunities, especially around edge compute, private networks and customised solutions, where operators should accelerate their efforts.

Enterprise 5G is an opportunity for the whole ecosystem

A broad ecosystem opportunity. Enterprise 5G creates growth potential across the entire ecosystem – from device OEMs such as drone makers and manufacturers of 5G-Advanced-supporting modules, to private 5G equipment specialists and edge hardware suppliers.

The operator role is work in progress. Operators can facilitate the market by providing public 5G/5G-Advanced access (while keeping monetisation in focus); they can choose to partner with specialists; or they can cede market share to ecosystem players.

The role of 5G in enterprise AI

Edge AI is part of enterprise investment. Enterprises are increasingly investing in edge AI to process data locally, reduce latency and enable real-time decision-making for applications such as autonomous systems, robotics and industrial automation.

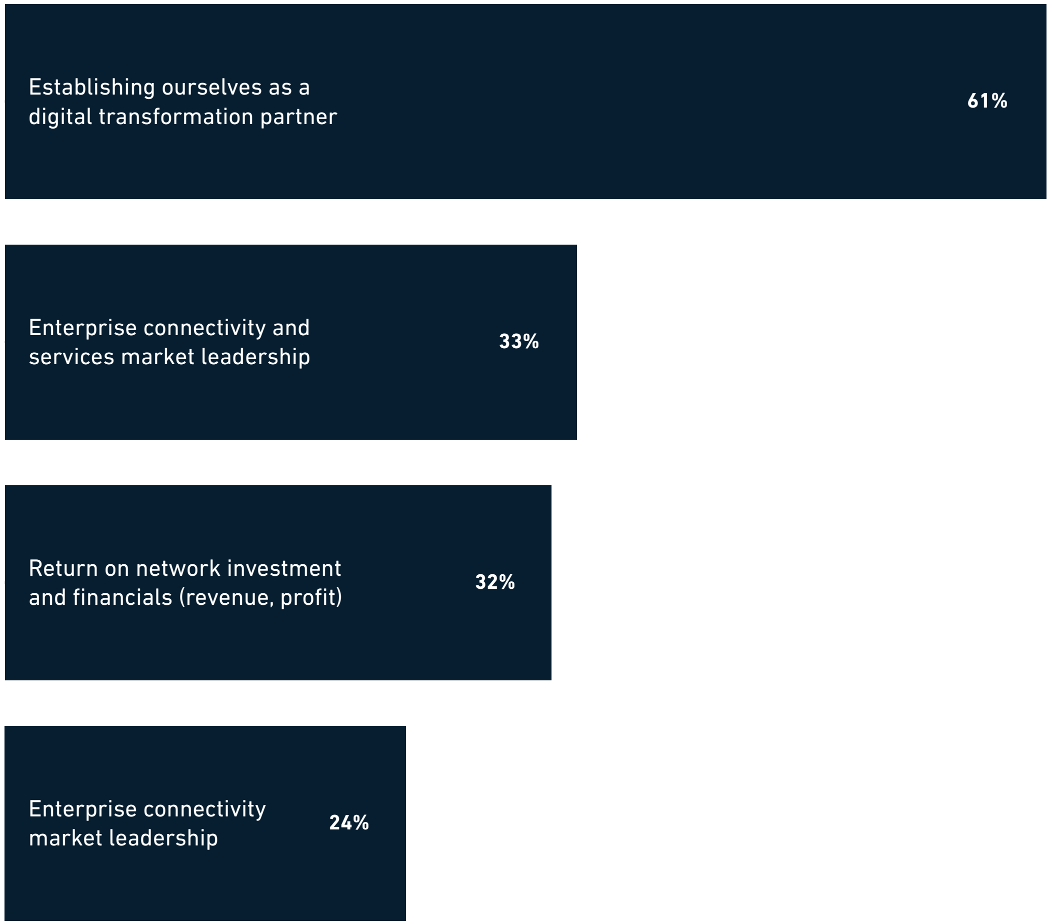
Designing networks to support edge AI. Opportunities span data centre connectivity, on-premise edge AI via edge compute, network slicing and private networks. Operators need greater clarity and focus to fully capitalise on this market.

Culture pivot: operators look to be the transformation partners of enterprises

- **Becoming digital transformation partners is top for the first time.** Being a leader in connectivity and services was historically the top goal of operators' enterprise strategies (based on a global annual survey of 100 operators). The shift to aiming to become digital transformation partners reflects growing recognition that the enterprise opportunity comes from the evolution of customer demand rather than from a 'technology push' approach.
- **Connectivity and services more important than connectivity leadership.** Leadership in enterprise connectivity and services has become the second-highest goal, overtaking pure connectivity leadership. Operators recognise that enterprise growth is driven by evolving customer needs.

Operators becoming digital transformation partners

What are the two primary goals driving your company's enterprise strategy? (Weighted score)



Source GSMA Intelligence Operators in Focus: Operator Enterprise Survey 2024

AI leads in digital transformation spend, followed by 5G and IoT data analytics

As part of its Global Digital Transformation Survey, GSMA Intelligence surveyed 5,320 enterprises on their digital transformation plans, focusing on objectives, investments, challenges, supplier decisions and enabling technology.

- **AI leads priority investments.** AI is the technology set to capture the biggest spend during 2025–2030 (20%). This is unsurprising, given the consensus among enterprises that AI will have a significant impact across several business areas.
- **5G ranks highly.** Following AI is enterprise spend on 5G connectivity and devices, including custom networks. This reflects growing expectations that 5G will be important to enable digital transformation.

AI and 5G top the investment priorities for digital transformation among enterprises

Spend on digital transformation by technology as a percentage of total spend on digital transformation, 2025–2030.

>15%	<15%
AI technology (generative and wider AI)	IoT and big data analytics
5G connectivity and devices (including custom networks)	Cloud technology (including edge computing)
	Cybersecurity technologies
	Connectivity and devices beyond mobile (fixed, Wi-Fi, satellite)

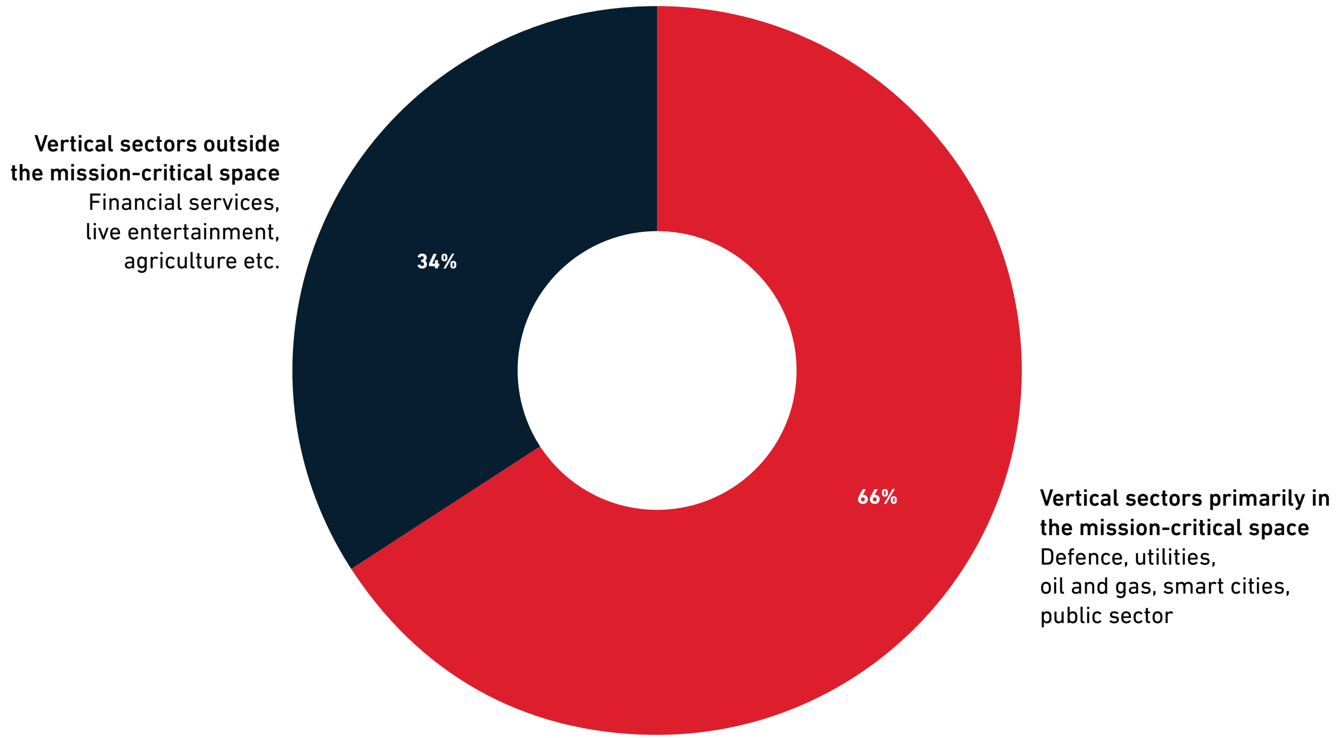
Source GSMA Intelligence Enterprise in Focus: Global Digital Transformation Survey 2025

5G emerges as an essential backbone in mission-critical industries

- **Private networks on the rise in the public sector and defence.** Operators ranked the public sector, defence and smart cities (core constituents of the 'mission-critical' group) at the top of the list of verticals demanding private networks. The inherent security and reliability of private networks are appealing in such scenarios.
- **Regulators and policymakers have a role to play.** Applications such as drone-assisted emergency response and deliveries from hospitals are heavily impacted by network regulations. Clear regulatory and policy frameworks will help accelerate market growth.

Demand for private wireless networks is growing in mission-critical industries

Thinking about vertical demand for private wireless networks (4G/5G), what are the top three industry verticals with the highest demand for your company's primary country of operations? Percentage of operators choosing sectors in top three.



Source GSMA Intelligence Operators in Focus: Operator Enterprise Survey 2024

In enterprise AI, there is a clear trend towards the edge

- **New compute and networking models required.** While the public cloud remains a key option in hosting and processing AI, several enterprise use cases call for processing at the edge (which could be on-premise, on-device or at the edge of the network).
- **Focus shifts to the private cloud.** Hosted private cloud rather than public cloud will be the main location where companies' AI workloads will be processed, according to respondents to GSMA Intelligence's survey of enterprises. As such, hyperscalers and edge compute specialists have been expanding hybrid cloud offerings tailored for greater control, sovereignty and processing at the edge.
- **Greater awareness needed of telco MEC.** Enterprises rank telco-provided MEC lower than hosted private cloud or public cloud. While telco-led edge compute services are more novel than established cloud options, low awareness should not be a factor limiting demand. In addition to service availability, operators should therefore ensure clear value propositions.

Processing of AI workloads shifts to the private cloud

Thinking about the next three years, where do you expect your company's AI workloads to be processed?
Base is enterprises that are already using or testing/planning to use genAI and/or wider AI technology.

1st	• Hosted private cloud
2nd	• Public cloud
Outside top 2	• Telco/MEC infrastructure • On premise • On device

Source GSMA Intelligence Enterprise in Focus: Global Digital Transformation Survey 2025

5G-Advanced sees early uptake in robotic systems and humanoids

- **Early adoption in robotic systems.** ZTE demonstrated robotics integrated with private 5G at the World Artificial Intelligence Conference 2025. Meanwhile, Telit Cinterion has validated its 5G RedCap modules with Nvidia's Jetson Thor platform, identifying strong potential for 5G in enabling humanoids, autonomous delivery systems and industrial robotics.
- **Enterprises link 6G expectations with robotics and AI automation.** AI, automation and robotics support rank high in enterprises' expectations for potential 6G use cases. According to the GSMA Intelligence Global Digital Transformation Survey, the appeal of potential 6G use cases for enhancing AI and robotics is greater than for communications.

Potential 6G use cases: enterprises see the appeal of robotics and AI automation

Which of the following potential 6G use cases would be appealing to your company's digital transformation? Aggregate figures across all countries and vertical sectors surveyed. Base is enterprises undertaking digital transformation. Percentage of respondents.

30–40%

- Advanced robotics
- AI assistants and autonomous systems

20–30%

- Autonomous mobility and transportation
- Immersive AR/VR, real-time services
- Machine-type communications

10–20%

- Satellite–cellular integrated communications
- Critical communications (public safety)

Source GSMA Intelligence Enterprise in Focus: Global Digital Transformation Survey 2025

Considerations for the year ahead

Harvesting the opportunity for 5G in mission-critical industries

- **The value is now proven.** Private 5G and network slicing are driving secure, reliable and prioritised connectivity, with hybrid public–private architectures enabling real-time operations across the public sector, defence and smart cities.
- **Regulatory and policy can enable faster growth.** Clear frameworks for drones, autonomous systems and critical infrastructure will be essential to scale up deployments and unlock broader adoption of mission-critical, 5G-based network deployments.

Realising the potential of AI infrastructure for operators

- **Extending the enterprise opportunity.** The enterprise segment currently accounts for 20–30% of operator revenue, with AI-enabled cloud infrastructure expanding the addressable market.
- **Making the telco AI infrastructure case compelling.** Operators can differentiate from hyperscalers by leveraging trust, local presence, auditability and certified national infrastructure. In 2026, these strengths will be key as enterprises prioritise resilience, data sovereignty and geopolitically aware cloud and AI solutions.

Finding a fit for 5G-Advanced in the AI story

- **5G and 5G-Advanced to ride the wave of physical AI.** Early uptake of 5G and 5G-Advanced in robotics marks progress from experimentation to early deployment, alongside growing private 5G offerings tailored to edge AI use cases. Momentum is building in robotics as the physical embodiment of AI, turning advances in foundation models into real-world autonomous action. In 2026, enterprise networks need to deliver reliable support for physical AI (robotics, drones, connected devices) in enterprise and industrial settings.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Telco security

Countering a fast-changing threat landscape

GLOBAL MOBILE TRENDS

Telco security

☆ News highlights from the last year

The telco threat landscape is rapidly evolving. Operators have a responsibility to protect their own critical infrastructure and ensure their customers' infrastructure is safe and resilient, avoiding costly breaches and trust erosion.

MARCH

Verizon partners with Accenture to help organisations tackle emerging cybersecurity threats

To address the rapidly evolving cybersecurity landscape, Verizon Business and Accenture announced a strategic partnership to accelerate the development and delivery of advanced cybersecurity solutions. It aims to help businesses mitigate growing threats such as data breaches and phishing attacks.

APRIL

AT&T joins forces with Palo Alto Networks

AT&T and Palo Alto Networks signed a strategic agreement to provide secure connectivity solutions tailored to address complex security needs.

APRIL

MTN experiences cybersecurity incident

MTN Group informed stakeholders that it experienced a cybersecurity incident that resulted in unauthorised access to the personal information of some MTN customers in certain markets. Its core network, billing systems and financial services infrastructure remained secure and fully operational.

APRIL

SK Telecom hit by cyberattack

The SK Telecom cyberattack led to the theft of the personal data of approximately 23 million customers.

AUGUST

Orange confirms cyberattack

Orange confirmed a cyberattack on one of its information systems, resulting in temporary service disruptions. The incident primarily affected operational systems servicing business clients and certain consumer services in France.

SEPTEMBER

KT discloses cyberattack

South Korea's second-largest telecoms provider KT Corporation disclosed a sophisticated cyberattack that compromised 278 customers' mobile payment systems, resulting in unauthorised transactions.

OCTOBER

LG Uplus reports cyberattack

LG Uplus reported a server hacking incident. It submitted a report detailing the breach to the Korea Internet & Security Agency.

DECEMBER

BT expands its cybersecurity-led services

BT launched a new sovereign platform designed to support secure, UK-managed delivery of digital services across the public and private sectors. It supports the integration of AI, analytics, cloud and voice.

Source Company press releases

Why it matters in 2026

The cost of non-action far outweighs that of action to tackle threats

An expanding attack surface demands a more vigilant approach

Growth of 5G and the expansion of IoT bring challenges. The rollout of 5G SA is unleashing new opportunities, but its cloud-native architecture brings fresh security challenges too.

Expansion of IoT and edge widens the attack surface. The rapid growth of IoT devices and edge computing is widening the attack surface, presenting new entry points and cyberattack vulnerabilities.

Rapidly evolving and increasing cyberthreats require proactivity

AI-powered cyberthreats grow. As malign actors leverage AI, operators are facing more sophisticated and targeted attacks.

Cybersecurity offers a competitive advantage. Investing in cybersecurity and enhancing defences can mitigate the risk of breaches, and build customer trust and brand reputation, helping to secure a competitive advantage.

Meeting regulatory requirements is not optional

Compliance with evolving data protection laws required. As regulation such as GDPR and AI laws continue to advance, operators must adhere to them and implement robust cybersecurity measures to protect sensitive data and secure LLMs.

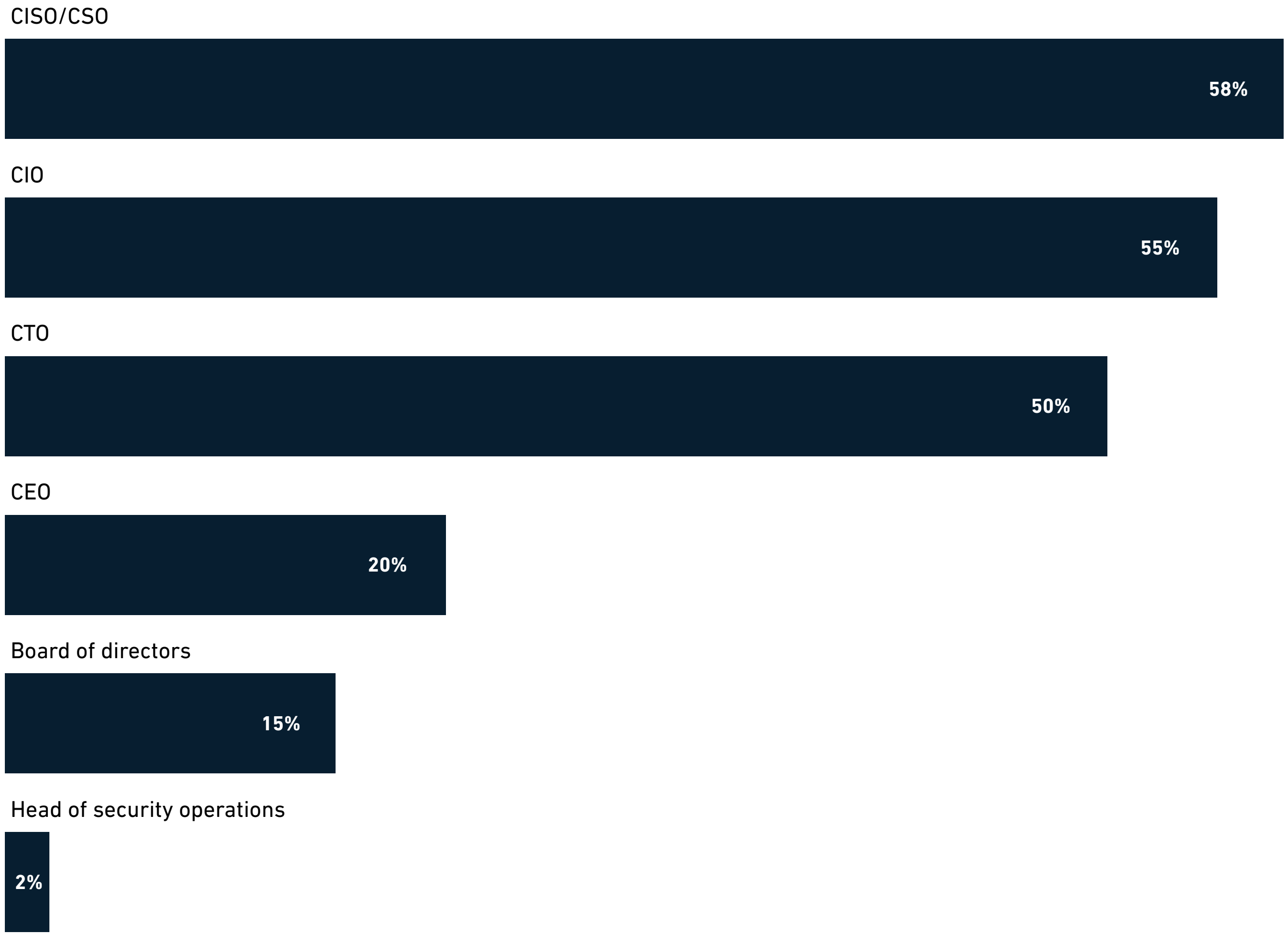
The costs of non-action are clear. By aligning cybersecurity strategies with regulatory compliance, operators can demonstrate responsible data and AI stewardship, and avoid costly penalties, damage to brand reputation and customer churn.

Cybersecurity is becoming everyone's responsibility

- **Adopting a C-suite approach.** Aligning technical security expertise, IT and technology strategy at the highest level is seen as key to addressing rapidly evolving and sophisticated cyberthreats. Cyber risk is becoming a board-level concern for organisations and a shared responsibility, requiring input from security, information and technology executives. Organisations with strong internal cybersecurity governance involve the CEO as well as the board of directors.
- **Ensuring future-ready defences.** For cybersecurity, executives have a responsibility to select the right vendors and tools, ensure compliance and resilience, and address cybersecurity-related challenges including a shortage of skilled professionals.

Cybersecurity is becoming a priority across the C-suite

Who has the greatest influence on the prioritisation of security requirements within your organisation? Select two.
Percentage of operators



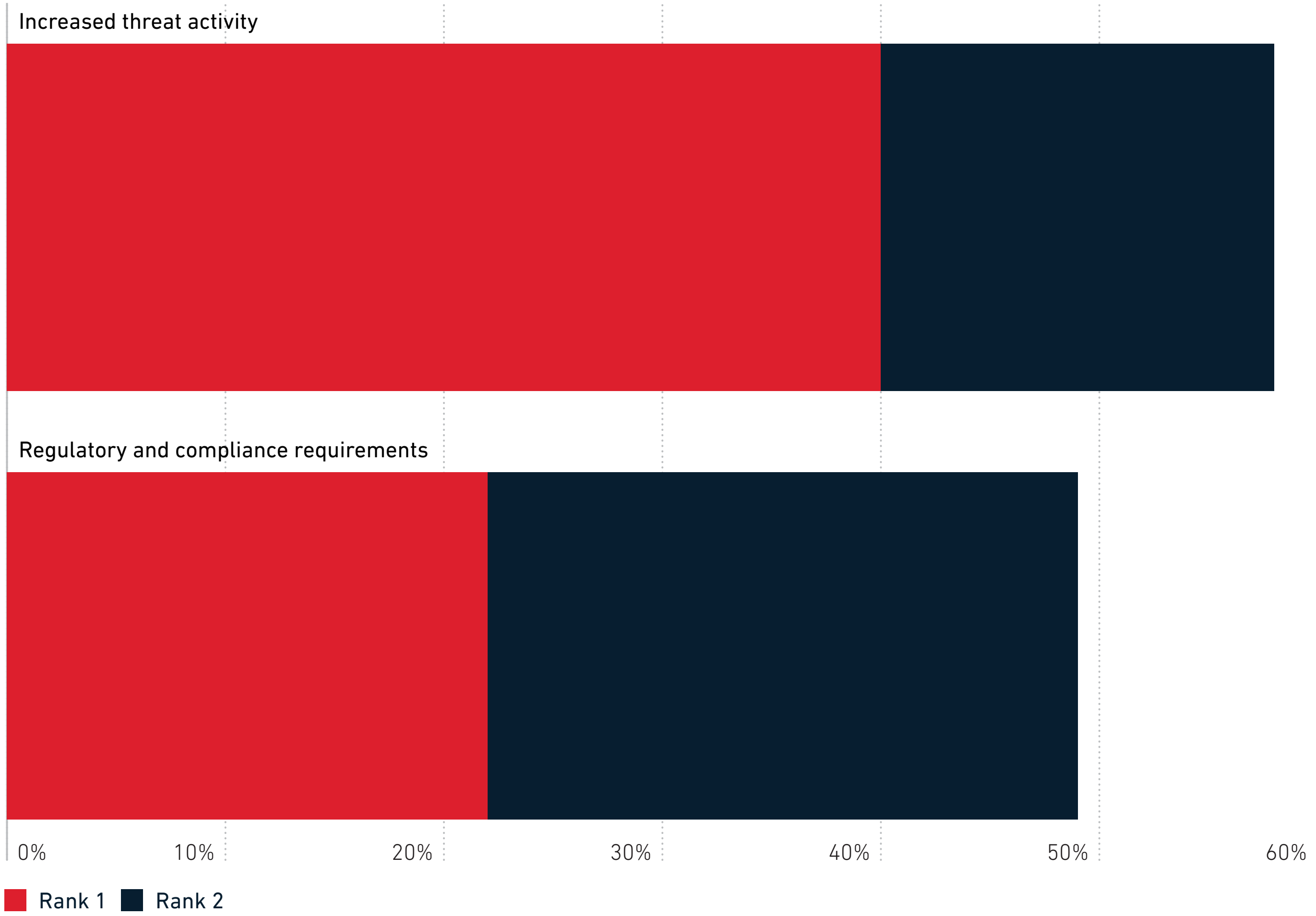
Source GSMA Intelligence Operator Security Survey 2025

Operators step up to tackle rising threats and comply with tightening regulations

- **The cybersecurity market expands.** The global cybersecurity market will reach approximately $289 billion by the end of 2030. Operators have a dual role to protect their own infrastructure and that of their customers.
- **Increased threat activities.** The rising frequency and complexity of cyberthreats are fuelling cybersecurity market growth and driving operators' cybersecurity strategies, particularly in MENA, Latin America and Asia Pacific.
- **Tighter regulations.** Regulatory and compliance requirements are also influencing operators' security strategies, particularly in Europe, North America and Sub-Saharan Africa regions.

Increased threat activity and regulatory compliance requirements are influencing operators' security strategies

What are the most important factors driving your organisation's security strategy? Select top two. Percentage of operators



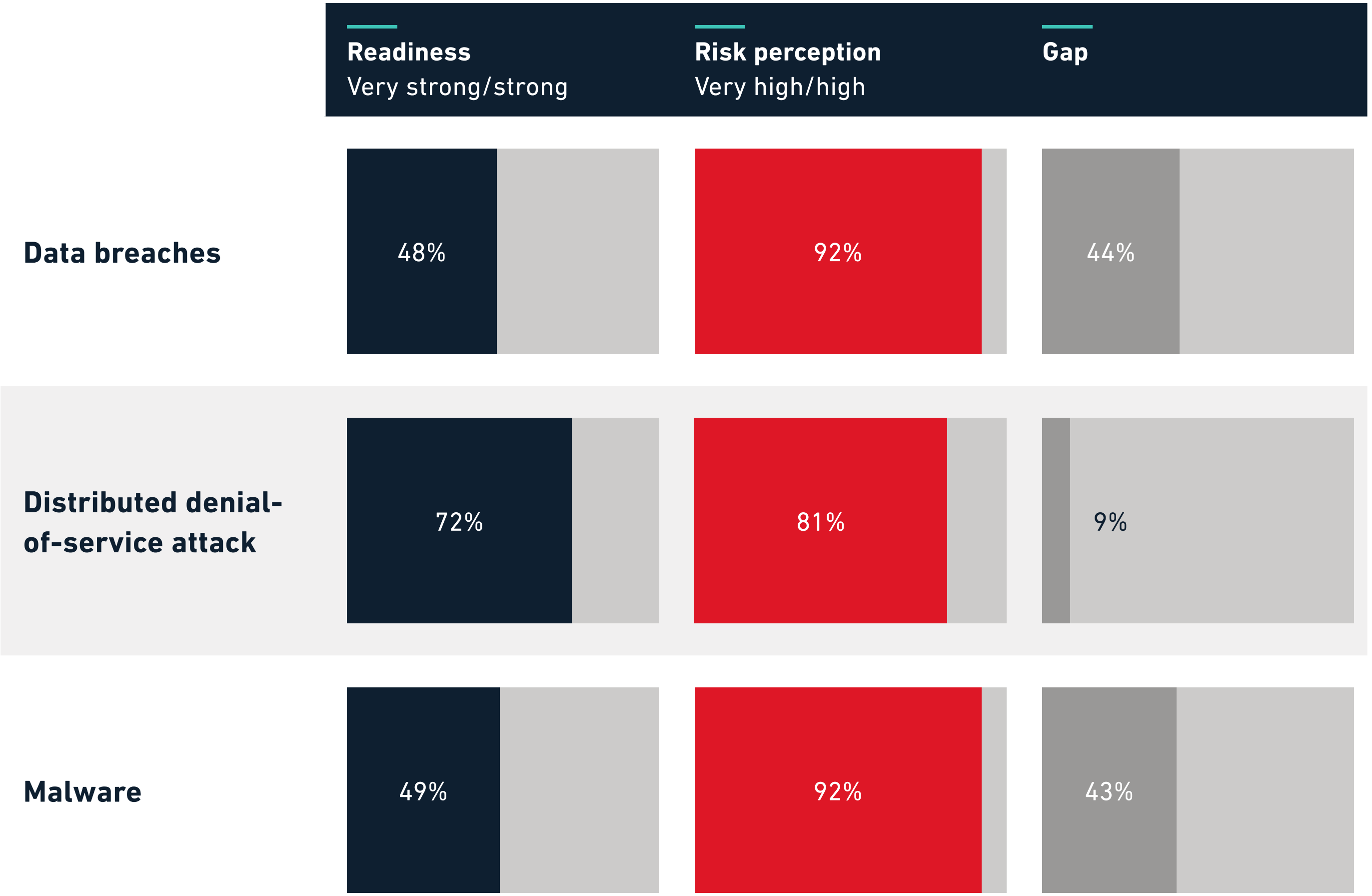
Source GSMA Intelligence Operator Security Survey 2025

Operator readiness versus risk perception: bridging the gap

- **Readiness is nuanced.** The threat landscape is far from uniform. Regional variations play a significant role in threat perception and the readiness of operators to respond.
- **Preventing data breaches remains critical.** More than 90% of operators globally perceive the threat level from data breaches to be high or very high.
- **Bridging the gap.** Less than half of operators surveyed rate their readiness to defend against data breaches as either strong or very strong, suggesting a wide readiness gap that needs to be bridged through focused cybersecurity investments.

Gaps need to be bridged through cybersecurity investments

How would you rate the threat level across the following threats impacting your organisation?
How would you rate your organisation's readiness to manage the following threat vectors?
Percentage of operators that selected very strong/strong and very high/high



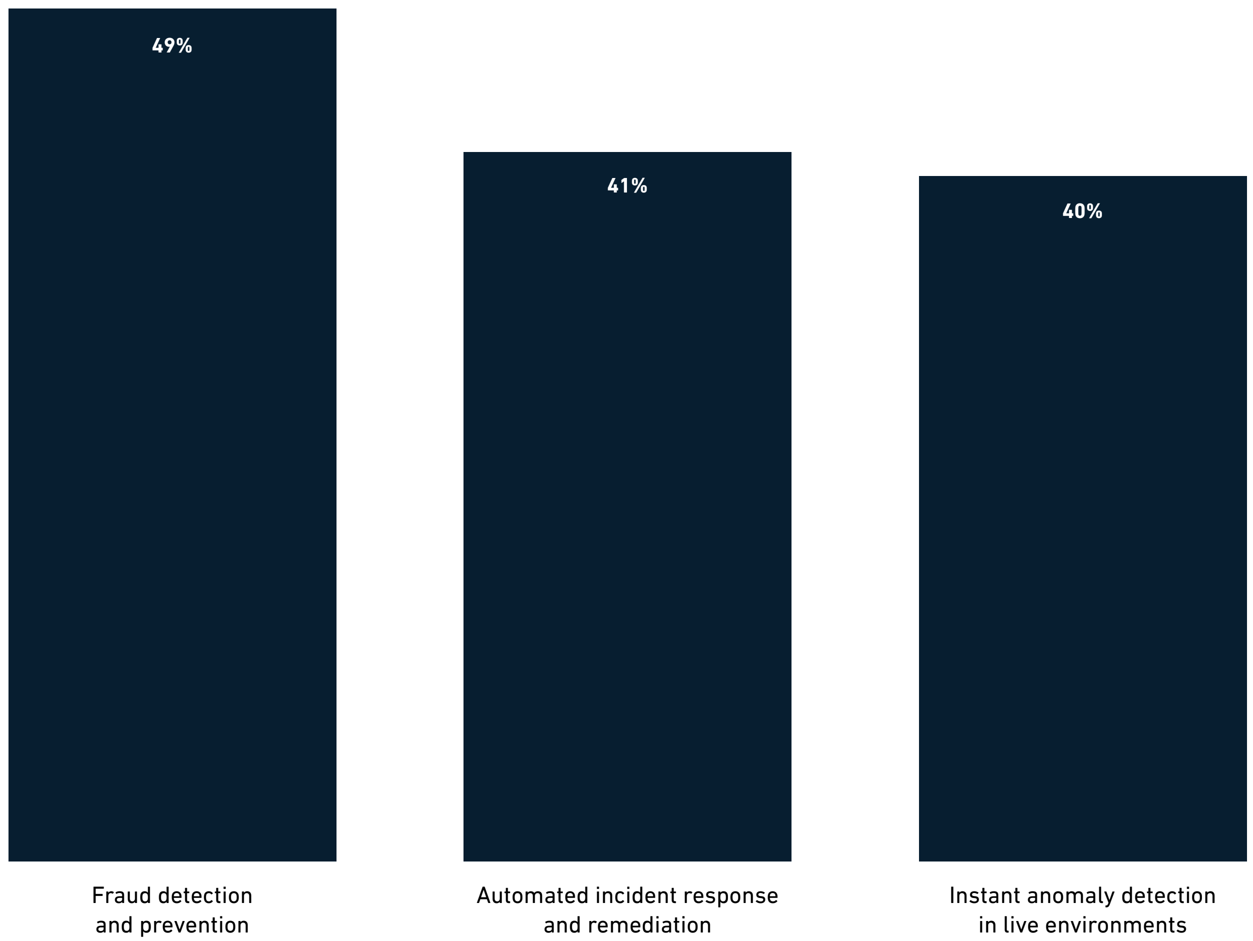
Source GSMA Intelligence Operator Security Survey 2025

The doubled-edged sword of AI highlights opportunities and risks

- **AI for protection.** Overall, operator sentiment towards AI is positive, with a large proportion arguing AI will enhance network security. AI can be employed as a tool to enhance network security and is particularly powerful when it automates incident response and remediation. However, concerns remain regarding its use, especially in terms of the reliability and explainability of AI models, and data privacy risks.
- **AI for cyberattacks.** AI can also be employed by cybercriminals to enhance cyberattacks. There are already a myriad of cyberattacks using AI, such as deepfakes, AI-powered malware, bots and DDoS attacks. AI-powered cyberthreats pose a real risk due to their sophistication and capability to quickly adapt and evade detection measures.

AI's value in telco security: getting ahead of threats before they happen

Which of the following AI/ML applications do you believe hold the most promise for enhancing telco security? Select top two. Percentage of operators.



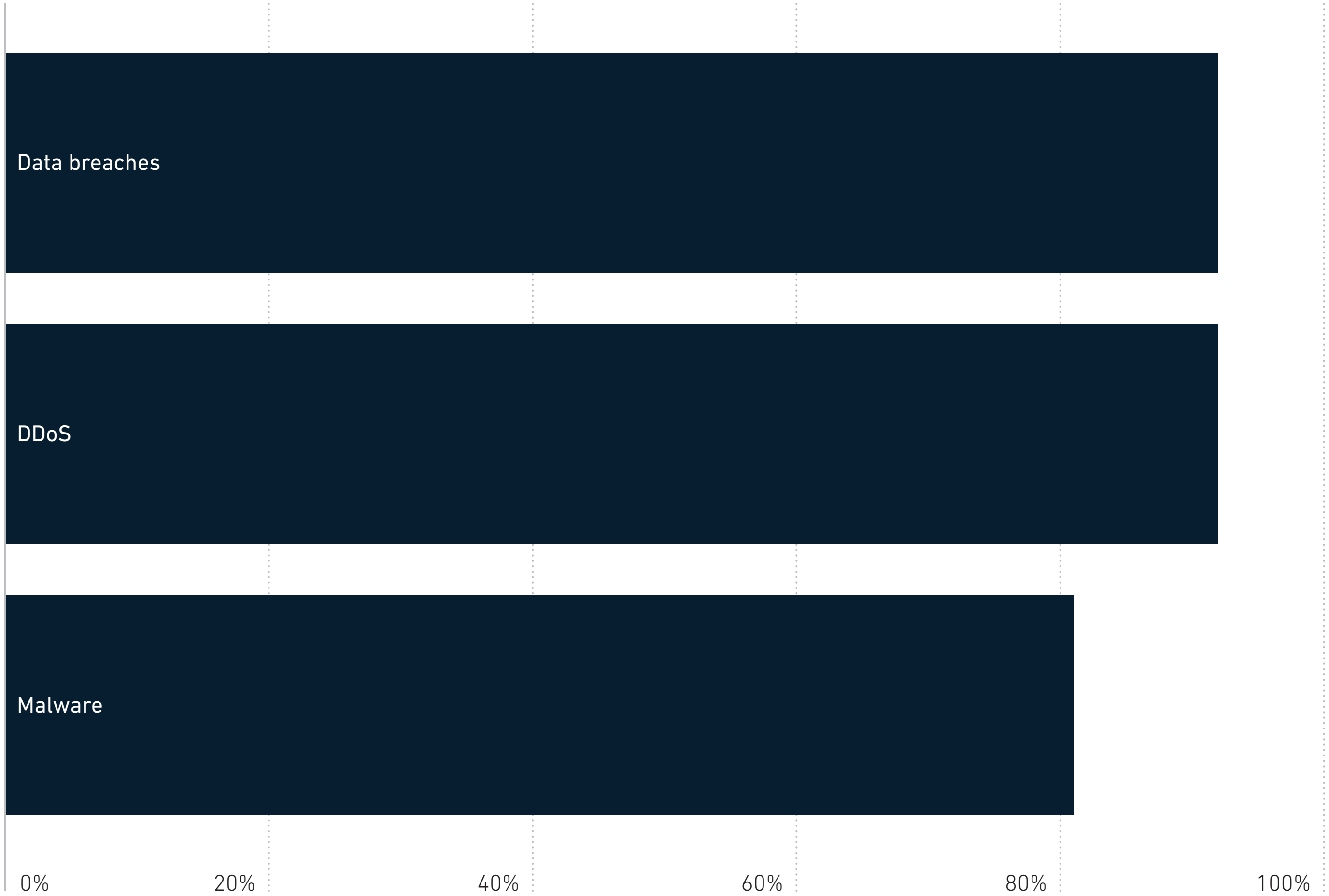
Source GSMA Intelligence Operator Security Survey 2025

Stay proactive, stay protected: a business imperative in the digital landscape

- **Protecting what you know.** Clearly identifying and securing core network, data and systems enables operators to respond promptly to emerging threats and regulatory requirements.
- **Staying informed on emerging threats.** In the face of increasingly sophisticated and rapidly evolving cyberthreats (particularly those powered by AI), operators must stay informed on the latest tactics and vulnerabilities.
- **Focusing on what matters.** By focusing on ongoing threat intelligence, advanced cybersecurity solutions and improving cybersecurity culture, operators can effectively respond to new risks.

Robust network security requires defences against data breaches and service disruption

How would you rate the threat level across the following threats impacting your organisation?
Percentage of operators rating high or very high



Source GSMA Intelligence Operator Security Survey 2025

Considerations for the year ahead

Prospects and obstacles of new technologies

- **Preparing for the quantum computing era.** Operators need to include quantum key distribution (QKD) on their roadmap, as it offers a level of security that cannot be compromised by even the most advanced computing methods, including anticipated quantum computers. QKD represents a significant step forward in safeguarding network communications and maintaining customer trust.
- **Tackling AI security issues.** Operators need to focus on overcoming the most pressing barriers to achieve full AI deployment in their operations.

Skills and integration

- **Skills are the biggest gap.** According to a large share of operators, a skills shortage is the biggest barrier to integrating AI into security.
- **Concerns can slow adoption.** Addressing the most pressing concern related to the use of AI in telco security will be critical to enhance network security and build customer trust. Operators need to collaborate to address AI use in telco security, with the primary concerns relating to the reliability of AI models and data privacy/protection risks.

From perimeter to design

- **A new way to plan security.** Rather than reacting to cyber incidents or relying solely on perimeter defences, forward-thinking operators are adopting a holistic approach, considering security from the initial design phase rather than as an add-on.
- **Security is a tool and a culture.** Effective cybersecurity extends beyond technology; it is a matter of culture. While investing in robust security tools and solutions is vital, fostering a culture of security awareness and responsibility among employees and operators is equally important

The quantum impact

The good, the bad and the unknown

GLOBAL MOBILE TRENDS

The quantum impact

☆ News highlights

ⓘ Why it matters

Quantum computing adoption among operators is at a nascent stage

Security and efficiency are initial use cases

Operators are prioritising industries with mission-critical needs

Partnerships span the gamut

Tackling the awareness gap is crucial

ⓘ Considerations for the year ahead

☆ News highlights from the last year

Quantum computing has seen significant activity across the telecoms industry in 2025, with operators identifying both opportunities and risks from the advent of quantum. Significant investments are being made to help operators prepare for the risks but also convert investments into returns.

JANUARY

SoftBank and Quantinuum announce partnership

SoftBank Japan and Quantinuum will collaborate on quantum research and identify use cases that can help create new services for a range of verticals.

FEBRUARY

SK Telecom signs MoU with IonQ on AI and quantum computing

SK Telecom signed an MoU with IonQ for AI quantum development, with the latter's trapped-ion technology integrated with SK Telecom's AI capabilities, including A. ("A dot") and Aster.

MARCH

Telefónica announces a new Centre of Excellence for quantum

Telefónica announced the launch of a new centre dedicated to quantum computing technologies in an effort to help the company's cryptographic agility strategy.

MAY

e& unveils white paper outlining its vision for the 6G era

UAE operator e& launched a white paper outlining its vision for 6G, with a focus on quantum-safe networks as a key pillar of transformation.

AUGUST

D-Wave and NTT DoCoMo expand quantum pilot

D-Wave and NTT DoCoMo have expanded on a pilot from 2024 which helped reduce congestion at cell sites by using annealing quantum solutions to reduce paging signals during peak calling times.

OCTOBER

Telstra and Silicon Quantum Computing (SQC) explore smarter network prediction

Telstra partnered with SQC to create a quantum reservoir to forecast network metrics and test the results against internal deep-learning models.

OCTOBER

SIngtel launches Southeast Asia's first hybrid "quantum-safe network"

Singtel has launched the region's first hybrid quantum-safe network. It deploys a hybrid architecture across both QKD and PQC to extend quantum security for enterprises beyond core data centres and head offices to the branch level.

DECEMBER

Deutsche Telekom invests in Quantum Systems

Deutsche Telekom's investment arm, T-Capital, made a strategic investment in Quantum Systems, a supplier of drone technology and systems, to develop proven and secure infrastructure for critical industries such as defence.

Source Company press releases

Why it matters in 2026

Operators need to plan and build a new network architecture of trust

Enterprise and telecoms network security needs major upgrades

Quantum computers can break through existing cryptographic security technology. Operators need to update their security architecture, as legacy algorithms cannot withstand the latest quantum computers.

Quantum computers already pose a threat. Although quantum technology is still evolving, attackers could steal and store credentials and user data today, and then crack the data later with the latest quantum technology.

Driving network efficiency is paramount

Network optimisation will lower energy consumption. Quantum can help operators improve traffic routing, shunting and sleep states to lower energy usage.

Smarter spectrum management. Quantum supports the use of massive MIMO and beamforming at cell-site level. Quantum offers greater precision that will drive assurance levels.

Anomaly and fault detection. Faster anomaly detection using quantum will help operators better pre-empt attacks.

Commercial products must be designed for quantum

Security-proofing of existing products and services. Quantum can improve network slicing products and private networks, which depend on low latency.

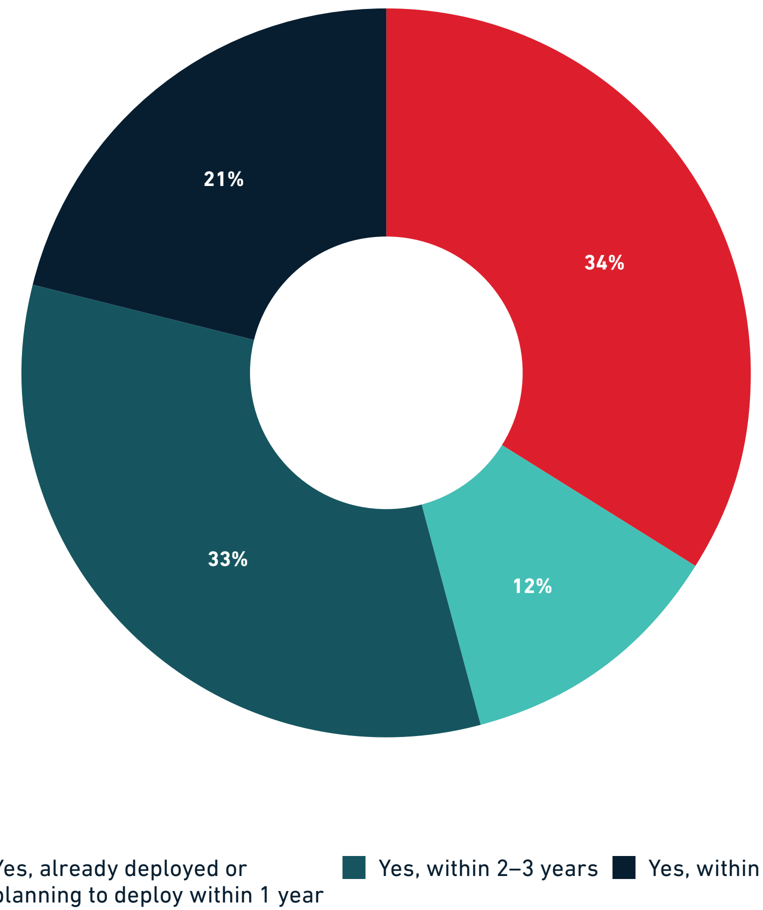
Underpinning new service and product offerings. Quantum is a new focus area for products such as advanced IoT, V2X and autonomous vehicles.

Quantum computing adoption among operators is at a nascent stage

- **Quantum on the roadmap.** Around 60% of global mobile operators have quantum computing on their roadmaps. However, what that means in practice will vary.
- **Security first.** Security against post-quantum computers is a priority, though only 12% of operators report their networks as "quantum safe".
- **Revenue next.** Operators can also leverage quantum in their product sets (e.g. IoT analytics, AI factories). This is a five-year story. The competitive risk is that tech leaders in quantum (e.g. Google, IBM) move earlier and reduce demand for operators.

Quantum computing is on the roadmap for operators, but the pace of adoption remains slow

Does your organisation plan to deploy quantum technologies in the next 1–5 years? Percentage of operators.



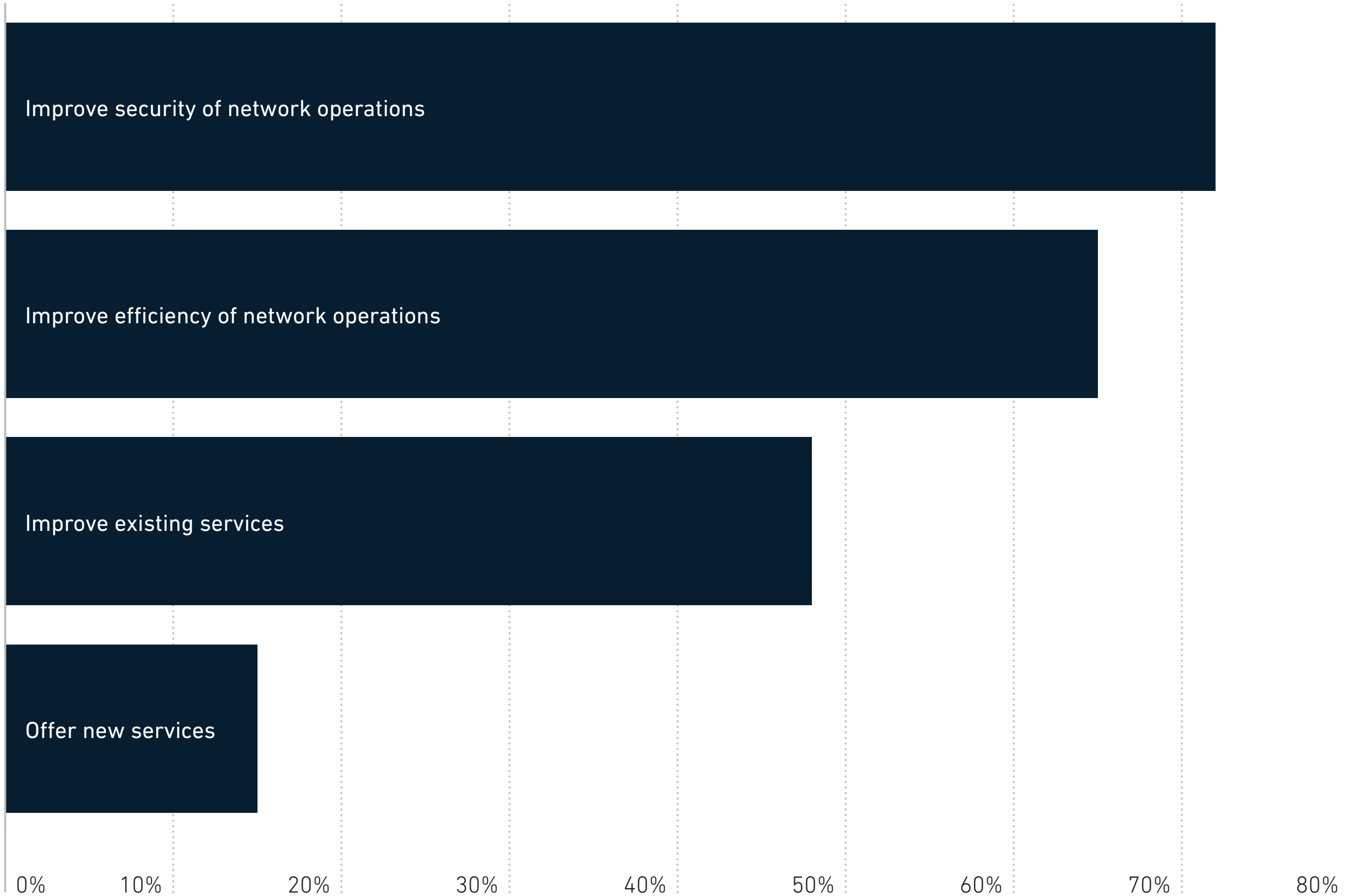
Source GSMA Intelligence Operator Quantum Survey 2025

Security and efficiency are initial use cases

- **Security on top.** Bolstering network security is seen as the top operator benefit of quantum. This is the other side of a double-edged sword, as quantum computers can disable conventional cryptography used in network and IT security.
- **Monetisation: perception versus reality.** Operators understand the benefit of quantum for enhancing network security and efficiency but are not yet convinced about monetiseable use cases. This does not mean the use cases do not exist; rather, operators are not really aware of them yet, with minds more focused on security imperatives.

Security and efficiency are seen as top benefits of deploying quantum technologies

What would be the expected benefit of quantum technology deployment at your organisation? (Select the top two)
Percentage of operators.



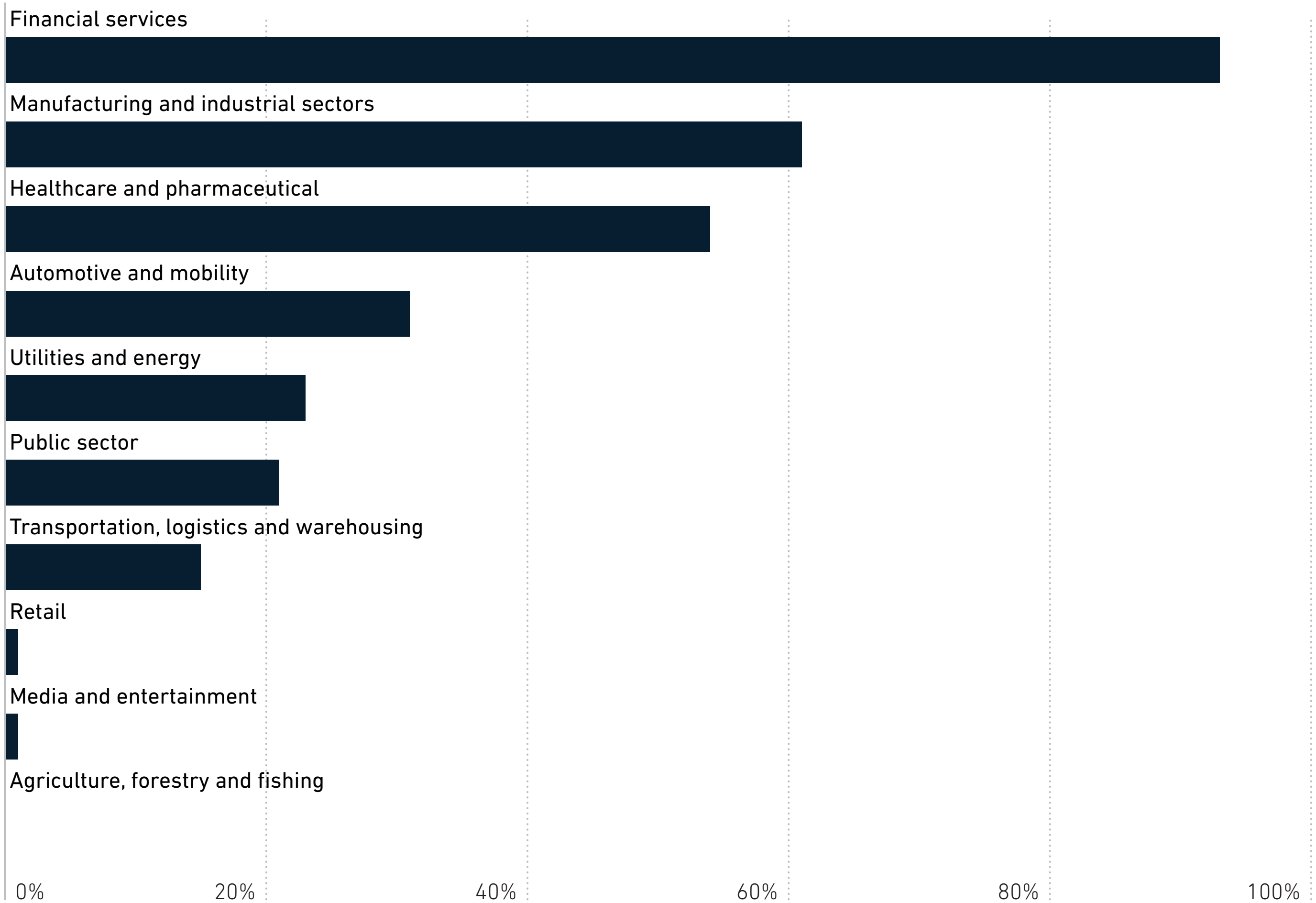
Source GSMA Intelligence Operator Quantum Survey 2025

Operators are prioritising industries with mission-critical needs

- **Mission critical comes first.** Operators view sectors with the most mission-critical connectivity requirements as particularly ripe for monetising quantum-based services. Finance (at around 90%) is a good example for new, "quantum-safe" secured connectivity for high frequency trading, potentially combined with private wireless.
- **The operator role in gaining a competitive advantage.** Businesses operating within these industries may gain a competitive advantage by opting for quantum-safe, high-capacity fibre links provided by operators, with firewalls and added security features embedded into bundles.

Financial and industrial sectors are the top verticals considering quantum

Please rank the vertical sectors expected to drive demand for quantum technology-based services for your organisation. Percentage of operators.



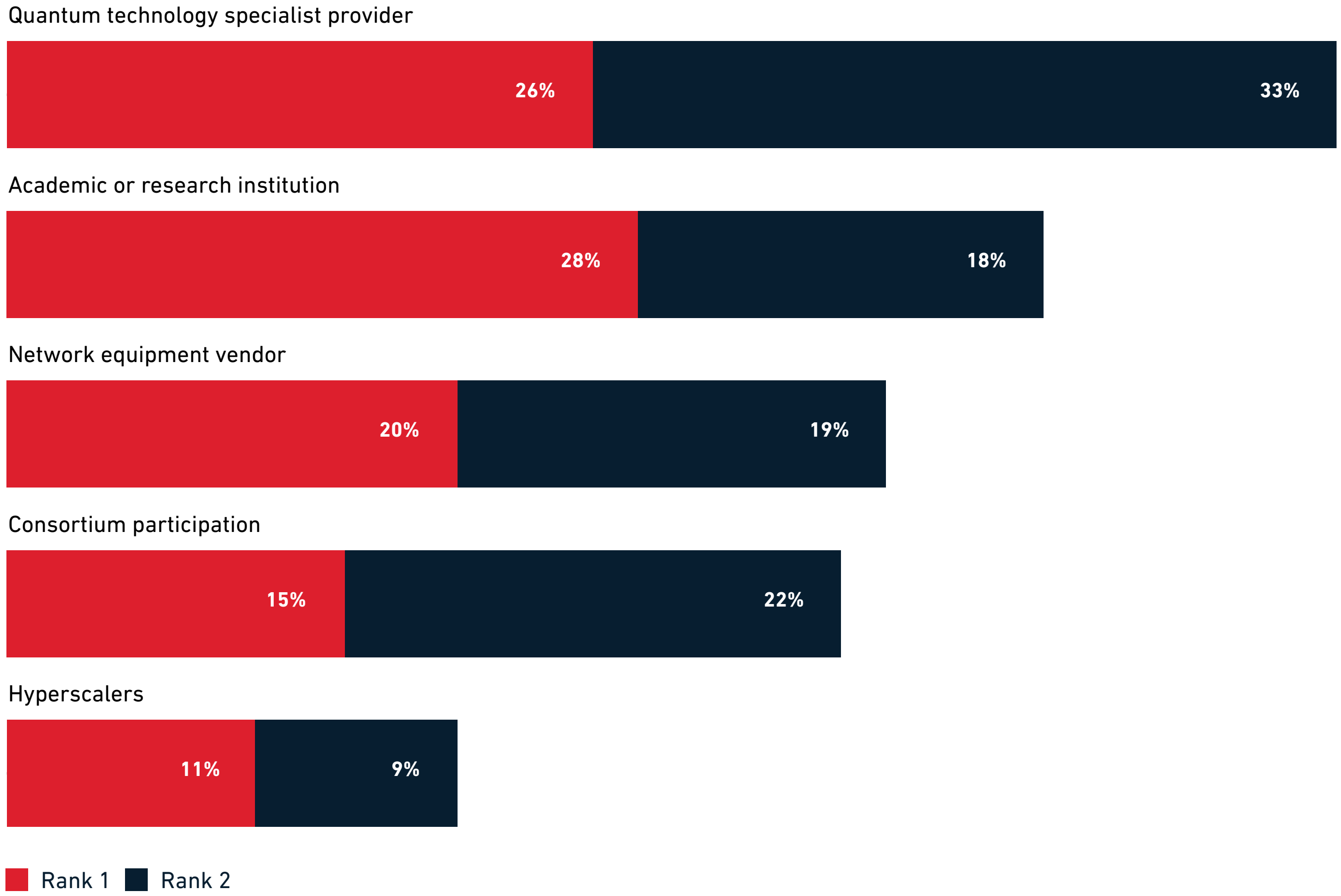
Source GSMA Intelligence Operator Quantum Survey 2025

Partnerships span the gamut

- **Taking a pragmatic approach.** Operators are adopting a pragmatic strategy for their partnerships to deploy quantum computing. A majority (59%) prefer working with dedicated quantum technology providers, while significant numbers also look to academic institutions and established network equipment vendors.
- **Cloud's role.** Operators who do not plan to deploy quantum in the next five years have indicated that hyperscalers are their preferred partners, reflecting a need for a cost-effective option for deployment.

Operators are adopting a pragmatic strategy, working with a mix of partners to deploy quantum technologies

Who are your preferred partners to invest in and/or work on quantum technologies? (Select top two)
Percentage of operators



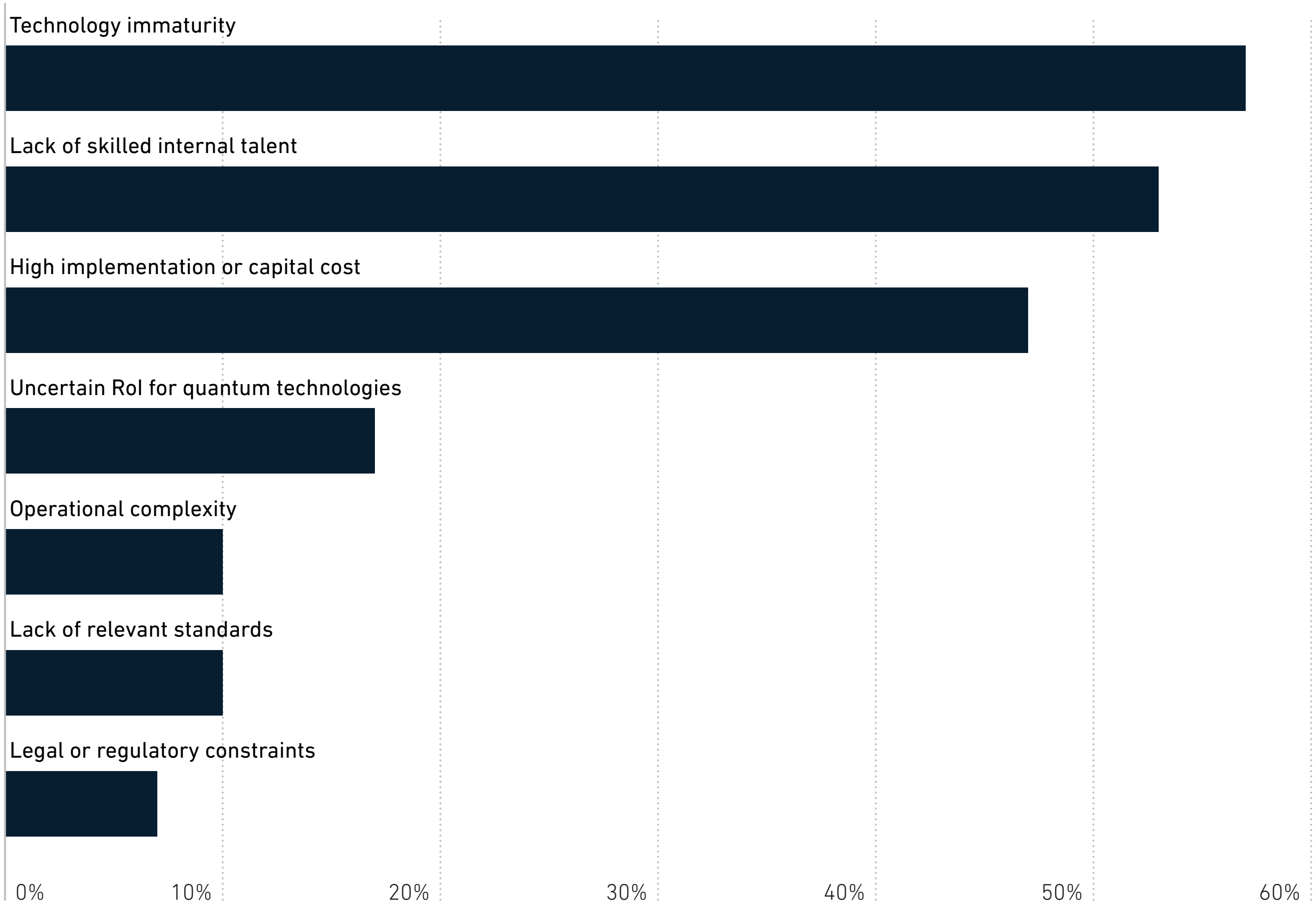
Source GSMA Intelligence Operator Quantum Survey 2025

Tackling the awareness gap in quantum is crucial

- **Barriers remain.** Quantum computing is an advanced technology. While it will be used in the telco business, how and when that happens will vary. Besides technological immaturity, operators also lack internal skilled labour and face high implementation costs.
- **Working to close knowledge gaps.** Despite the challenges, operators are working to close gaps through collaborative efforts with academia and research agencies, while driving alignment in standards.
- **Acting faster.** Barriers aside, the risk of deferring investment or de-prioritising quantum now is that it has a net negative impact, most likely through security vulnerabilities. Closing the awareness gap is important in mitigating this risk, which should move the timetable up to act to the next two years.

Technology immaturity is cited as the biggest barrier to quantum adoption

Which barriers do you expect to have the greatest impact on your organisation's quantum strategy over the expected roadmap period?



Source GSMA Intelligence Operator Quantum Survey 2025

Considerations for the year ahead

Quantum moves from the labs to the field

- **The need for scale.** Quantum needs to expand beyond the core data centres and head office to branches and beyond.
- **Strategy requires clarity.** Operators will need strategic clarity on whether to monetise quantum investments or simply invest to protect their networks.

2026 to see deployment of hybrid architecture, quantum-safe networks

- **A middle ground.** Quantum-safe networks will be a hybrid of QKD for mission-critical connectivity and PQC for upgrading legacy networks.
- **Value of hybrid.** Hybrid architectures will be the way to balance difficult technical trade-offs and also scale cost-effectively. But how many operators can orchestrate this kind of set-up?

Plugging gaps across the broader ecosystem

- **Overcoming skills gaps.** Operators need to invest in internal skilling and technical resources. This is likely to be a multi-pronged approach of hiring specialist talent and partnering with universities and other research groups on areas of common ground.
- **Devices' role.** Device makers will need to prepare for the advent of quantum-safe networks. Operators will need to set up testing and certification labs to ensure seamless connectivity with their quantum-safe networks.

Globalstar™

Satellites and D2D

A new normal?

GLOBAL MOBILE TRENDS

Satellites and D2D

☆ News highlights

ⓘ Why it matters

2026 is go time for commercialisation

D2D go-to-market sees a mixed approach to pricing

Starlink versus the field: it's getting harder to close the gap

Spectrum makes winners and losers

Consolidation comes early

Considerations for the year ahead

☆ News highlights from the last year

2025 was about constellations being established to enable direct-to-device (D2D) trials and full-scale commercial launches. The spate of consolidation reinforces the risks of being sub-scale in a (heavy) capex business. Further consolidation is likely in 2026.

MARCH

Verizon offers satellite SMS

Verizon customers were the first in the US to enjoy satellite texting to any device with select Android smartphones.

APRIL

KDDI and Starlink reach ubiquitous coverage

Au has expanded coverage to all of Japan with au Starlink Direct, a D2D satellite service.

APRIL

Rakuten and AST SpaceMobile show a satellite video call in action

Rakuten Mobile and AST SpaceMobile successfully held the first video call in Japan using low-Earth orbit (LEO) satellite and unmodified smartphones.

SEPTEMBER

Starlink buys EchoStar spectrum for $17 billion

EchoStar announced a spectrum sale and commercial agreement with SpaceX for spectrum holdings valued at $17 billion.

SEPTEMBER

Viasat and Space42 launch a venture to compete in D2D

Space42 and Viasat are to launch the Equatys Venture with access to the world's largest coordinated spectrum block for global D2D services.

OCTOBER

Veon launches with Starlink, starting in Ukraine

Kyivstar – part of the Veon group – has launched satellite service in Ukraine powered by Starlink.

OCTOBER

Omnispace and Lynk announce merger

Omnispace and Lynk have entered into a full merger, underpinned by a global S-band licence and the need for scale.

NOVEMBER

Orange launches satellite SMS

Orange became the first European operator to offer satellite SMS using D2D technology.

Source Company press releases

Why it matters in 2026

Satellite fast becomes 'normal' but with varied competitive dynamics

Satellite is fast becoming 'normal'

Around 70% of operators involved. The majority of mobile operators are involved in at least one satellite partnership, implying an addressable base of around 4 billion people. Most tier-1 operators are now involved, meaning incremental coverage will primarily come from tier 2 and 3 operators.

Value lies in a seamless blend. As much as satellite is a 'cool' topic from a technology perspective, the value is in a pragmatic integration with mobile networks, where coverage switches seamlessly (much like handovers between cellular and Wi-Fi).

Monetisation versus churn

$30–35 billion in revenues by 2035. GSMA Intelligence estimates an incremental revenue opportunity from D2D of $30–35 billion by 2035. This implies a 2–3% uplift on the telco top line worldwide. Even if only a fraction of that comes to pass, it is a meaningful number.

Bolstering coverage and quality. For operators, satellite integration is ultimately about enhancing their reach in unconnected areas. Because coverage is still the No.1 purchase criteria for people when selecting an operator, anything that improves coverage is desirable.

Consolidation moves up

The Starlink effect. Starlink is the clear first mover, controlling around 90% of existing orbital capacity. A range of other LEO providers (including AST SpaceMobile, Amazon and legacy satellite groups) are seeking to blunt that advantage, but it takes time and money.

Infrastructure capex needs scale. Consolidation has come early, with a raft of recent deals as proof points. This is mostly to consolidate scale to fund the capex required for global constellation build-outs.

2026 is go time for commercialisation

- **Sector-wide momentum.** Telecoms operators representing 70% of global market share now have at least one satellite partnership. This continues to grow each month. It is a global trend rather than being regional specific. The focus now is on operationalising partnerships with trials and full-scale service availability. D2D is, in short, becoming a fourth dimension of connectivity after mobile, fixed and Wi-Fi.
- **Deployment in phases.** With the exception of Starlink, deployed orbital capacity remains a minority of what will be available once constellations are launched in full. For this reason, D2D service availability will occur in phases, from partial uptime (e.g. 4–5 hours per day) in 2026/2027 to 24×7 coverage in 2027/2028 for most providers.

Around 70% of operators are involved in satellites, making it a de-facto fourth dimension of connectivity

Metric	December 2025	Change Three months to December 2025
Operators with satellite service*	118	+8
of which are live	33	+5
of which are planned or testing	85	+3
Mobile connections footprint (million)	6,141	
Share of total connections base covered by satellites and NTNs	70%	+3 pp

* Unique operator groups or operating companies with at least one satellite partnership

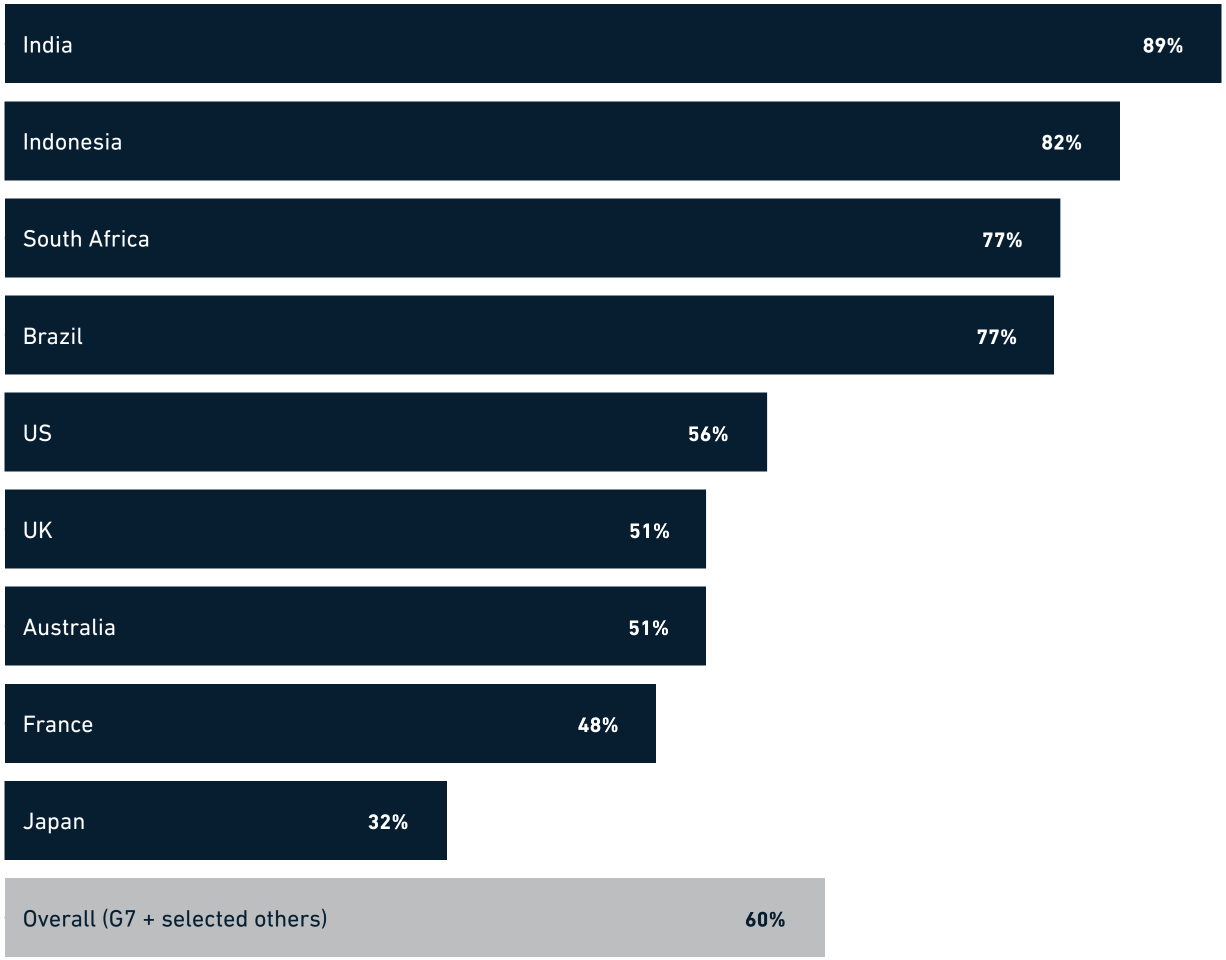
Source GSMA Intelligence

D2D go-to-market sees a mixed approach to pricing

- **Build it and they will come?** The answer to this question appears positive for D2D (at least for now), based on consumer survey evidence. Around 60% of people say they would pay extra each month if satellite service was incorporated into their tariff from a mobile operator. This skews higher in emerging markets such as India and Brazil where coverage gaps are more prominent.
- **Bundling comes first.** Operators are initially bundling D2D satellite services (especially SMS) into existing plans at zero or minimal incremental cost, using them as a churn-reduction tool. Where operators are charging (e.g. T-Mobile US, One NZ), the fee is applied to mid-level tariffs, with an average uplift of 15–30% on contract ARPU.

Around 60% of people would pay for satellite, on top of their existing monthly spend

Percentage of consumers



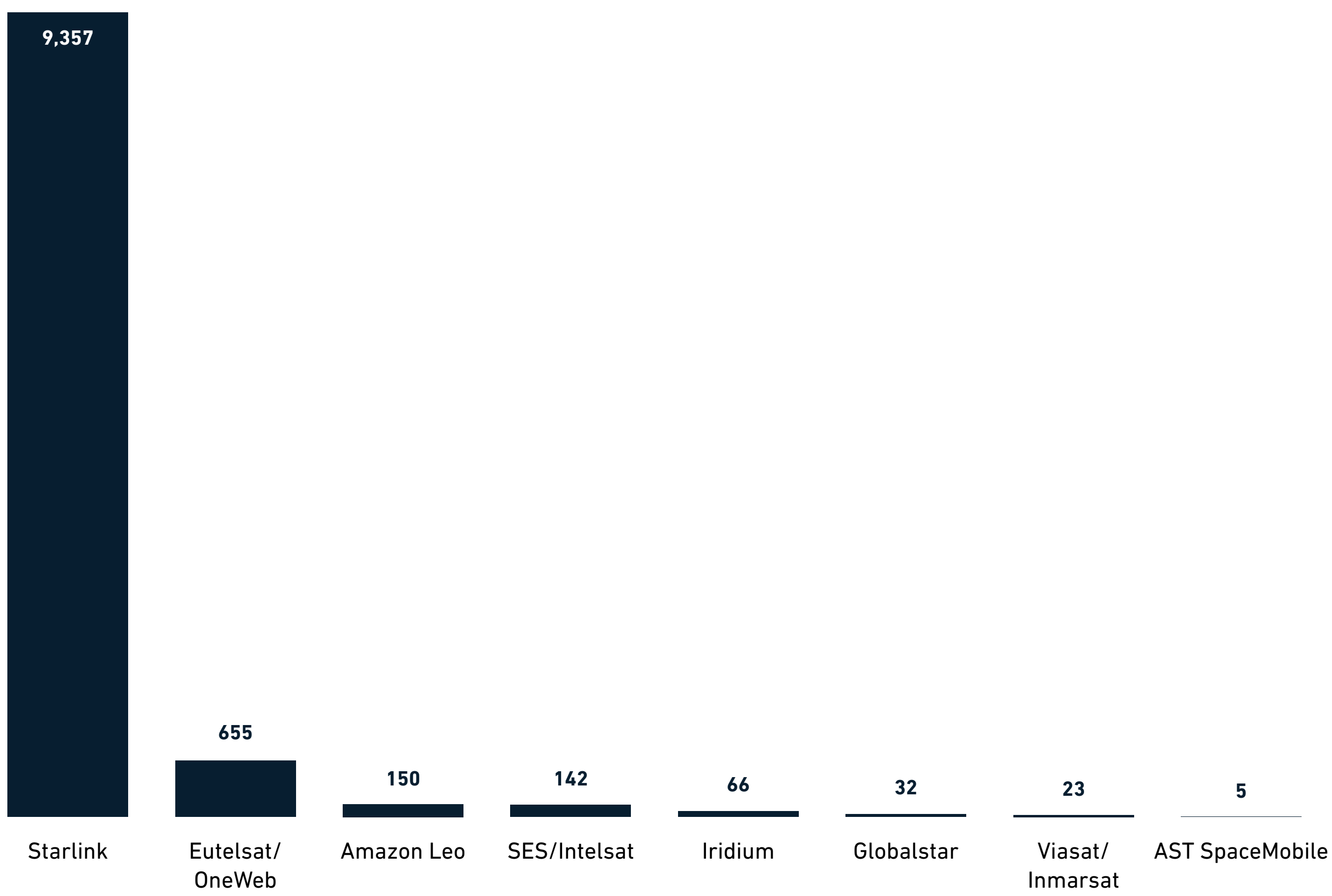
Source GSMA Intelligence and Viasat survey on consumer attitudes to satellite (May/June 2025)

Starlink versus the field: it's getting harder to close the gap

- **Starlink – a clear first mover.** Starlink controls around 90% of existing satellite orbital capacity from all providers, split between broadband, D2D and IoT verticals (mostly maritime). On the current run rate, it should reach its initial constellation of 12,000 satellites in less than two years.
- **It's a long race.** Many well funded and experienced satellite companies are competing. Consolidation has already taken root to drive infrastructure and spectrum scale. This is expected to continue in 2026 and 2027. Who the winners and losers will be ultimately comes down to coverage and service capability. Voice and mobile internet services (at least at 4G speeds) remain an open question.

Starlink aims for an initial constellation of 12,000

Satellites currently in orbit



Source GSMA Intelligence

Spectrum makes winners and losers

- **MSS grows in value.** Spectrum scarcity is a major limiting factor for satellite capacity. This is why it has become a key competitive lever of differentiation. The most notable activity in 2025 centred on the pursuit of MSS spectrum because it is globally harmonised and therefore offers easier market entry. Starlink's purchase of EchoStar's holdings ($17 billion in September) was the headline grabber, while AST SpaceMobile's move to acquire Ligado's spectrum has the same purpose.
- **Spectrum holdings form a large part of merger value.** The Omnispace/Lynk transaction is a good example, underpinned by the global S-band holdings of the former. The Viasat/Space42 joint venture, through Equatys, has a similar goal.

A patchwork of spectrum in a scarce world

Constellation provider	Spectrum model	L band	S band	MNO holdings (IMT)	Ka	Ku
Starlink	IMT, MSS		Y	Y	Y	Y
AST SpaceMobile	IMT, MSS	Y	Y	Y		
Lynk	IMT			Y		
Amazon Leo	Ka/Ku				Y	Y
Omnispace	MSS		Y			
Space42 (Yahsat + Bayanat)	MSS	Y			Y	
Eutelsat/OneWeb	MSS				Y	Y
Viasat/Inmarsat	MSS	Y	Y			
Iridium	MSS	Y				
SES/Intelsat	MSS				Y	Y
Globalstar	MSS	Y	Y	Y		
Skylo	MSS	Y	Y			
EchoStar	MSS		Y		Y	Y

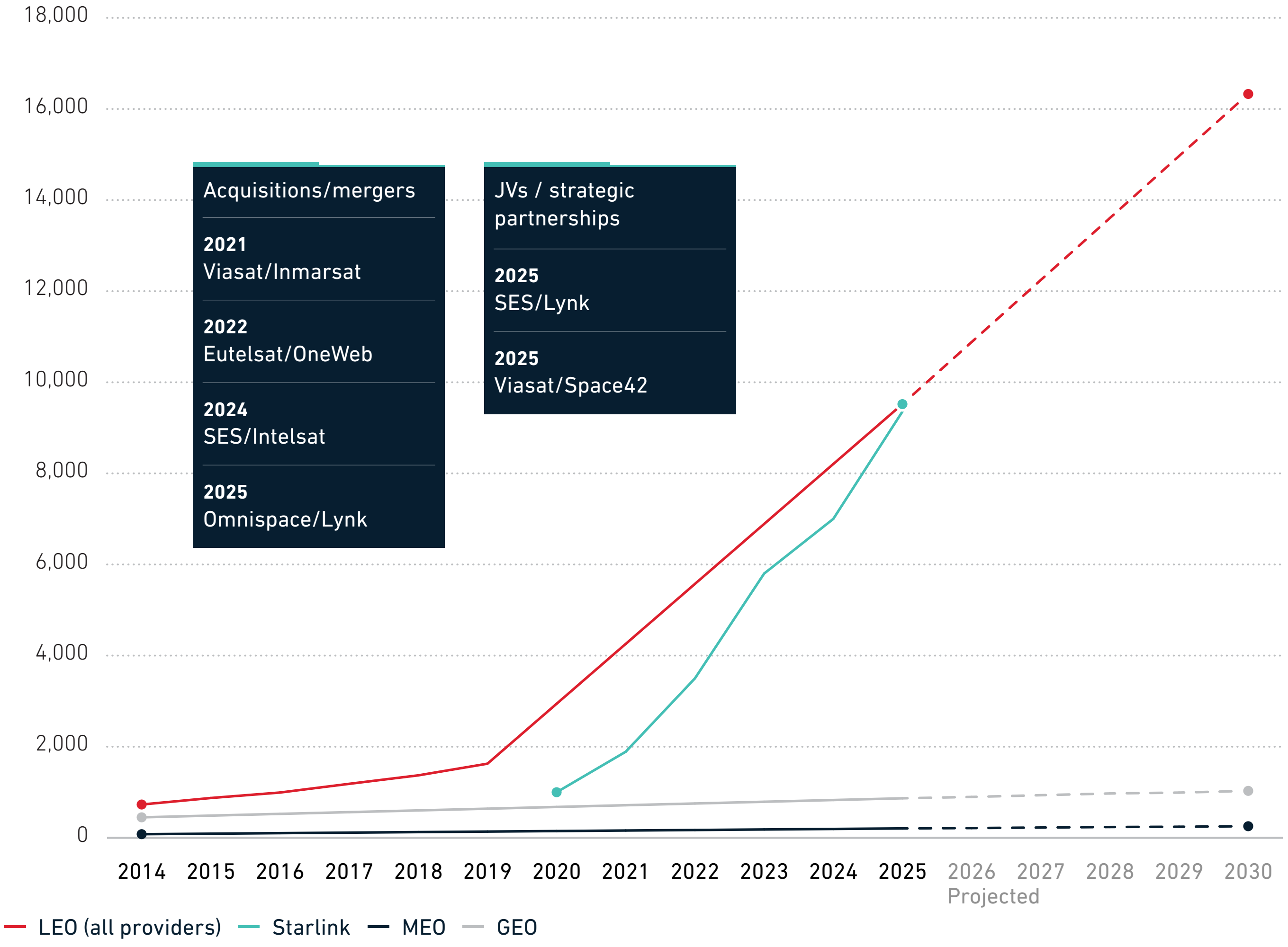
Source GSMA Intelligence

Consolidation comes early

- **A wave of mergers.** M&A activity in the satellite sector has continued off the back of notable deals in 2021 and 2022.
- **It's about scale.** Capex pressures and sub-scale spectrum positions are the drivers of consolidation, something that has been exacerbated by Starlink's first-mover advantage.
- **More to come?** The prospect of further consolidation is likely in the next 18–24 months given the finite nature of spectrum availability.

Satellite consolidation isn't new but is gathering pace

Total satellites in orbit (cumulative)



Note: examples shown are a selection and not exhaustive.

Source GSMA Intelligence

Considerations for the year ahead

Commercial results

- **Pricing leverage possible?** In 2026, operators will test whether D2D services can move beyond bundled SMS to paid tiers or add-ons (voice, low-rate internet data), determining if satellite becomes a sustainable ARPU lever and driver of 5G monetisation rather than a defensive feature.
- **Consolidation will have an impact.** As the satellite industry consolidates, operators may face a reduced choice of partners, shifting bargaining power on pricing, exclusivity and go-to-market control.

Spectrum and consolidation

- **IMT rationing.** Operators running a repurposing model (e.g. with Starlink and AST SpaceMobile) will need to assess how much licensed spectrum they are willing to dedicate to satellite use, under what terms, and whether the economic return justifies potential constraints on terrestrial network capacity.
- **Growing value of MSS.** The upcoming European S-band auction will force operators to weigh the cost of acquiring dedicated satellite-friendly spectrum against the long-term revenue potential of D2D, shaping investment timing and pricing strategies across the region.

Devices

- **Chipset advancements.** Look for broader support across mainstream SoCs, improved hardware accelerators for low-latency peer discovery, and tighter integration of security and interference management, enabling more reliable consumer D2D services.
- **Handsets?** Device OEMs are likely to release firmware and OS updates enabling more seamless D2D service, including auto-discovery and secure connection handling. Mass-market availability is still two or three years away, as 5G NTN standards (non-IMT) are only compatible with Release 17 or later.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Satellites in IoT

Old favourites and new pursuits

GLOBAL MOBILE TRENDS

Satellites in IoT

☆ News highlights

ⓘ Why it matters

500× expansion available, but can it be realised?

Satellites may be fancy, but this is about solving basic problems

Standards make IoT ready for prime time

Verticals: it’s not who is buying; it’s who isn’t

Satellites can complement the wider portfolio

Considerations for the year ahead

☆ News highlights from the last year

2025 was a proof-point year for satellite IoT. Skylo, Sateliot, Globalstar and others brought new products and demonstrations to market, showcasing the technical viability of NTN IoT across a range of use cases.

FEBRUARY

Globalstar launches two-way satellite IoT system

The two-way RM200M module is the first satellite module with integrated GNSS, Bluetooth, accelerometer and application processor.

MARCH

Verizon partners with Skylo for satellite-based IoT services

Verizon has partnered with Skylo to extend satellite-based IoT services beyond its existing footprint, complementing other wholesale partnerships Verizon has in place.

MARCH

Sateliot closes new funding round

Sateliot closed a €70 million Series B round with €10 million from Hyperion to advance its satellite constellation.

MAY

Sateliot expands its presence in Australia

Sateliot announced the launch of its 5G standard-based satellite IoT services across Australia, with a projection to support up to 300,000 IoT devices.

SEPTEMBER

Iridium and Deutsche Telekom move closer to commercial IoT launch

Iridium has begun the integration of Iridium NTN Direct with Deutsche Telekom infrastructure.

OCTOBER

Skylo signs with Tele2 – a first in Sweden

Tele2 became the first Swedish operator to launch satellite IoT connectivity with Skylo.

OCTOBER

Sateliot and Nordic Semiconductor prove an industry first

Sateliot and Nordic Semiconductor completed the first 5G IoT transmission from a standard cellular IoT device via a LEO satellite constellation.

NOVEMBER

OQ expands satellite IoT services in Luxembourg

Luxembourg granted OQ Technology a concession for satellite-based 5G IoT and D2D services.

Source Company press releases

Why it matters in 2026

The search for scale

Coverage matters, and gaps exist

Spatial realities. Although mobile network coverage (3G at a minimum) reaches 90% of the global population, only around 15% of the earth's total land and sea area has a cellular signal. Many companies with transient operations still experience coverage gaps on a daily basis, with satellite the default stopgap.

Value in new markets. There is strategic value for satellite and telecoms operators in targeting new verticals (e.g. logistics, energy, environmental monitoring).

Revenue diversification

Supporting differentiation. As NTN standards have matured, satellite IoT has become increasingly interoperable with mobile infrastructure, enabling seamless global IoT solutions and hybrid connectivity packages. This supports joint go-to-market strategies and partnerships that address diverse customer needs while differentiating telecoms operators in competitive markets.

2.5–3.0 billion devices in play. GSMA Intelligence estimates 2.5–3.0 billion devices are addressable, presenting a 500× rise in what satellite IoT currently reaches.

Confronting structural challenges

Momentum persists. The satellite IoT market is expanding rapidly with growing demand and investment, especially in LEO constellations, driving lower latency and cost efficiencies.

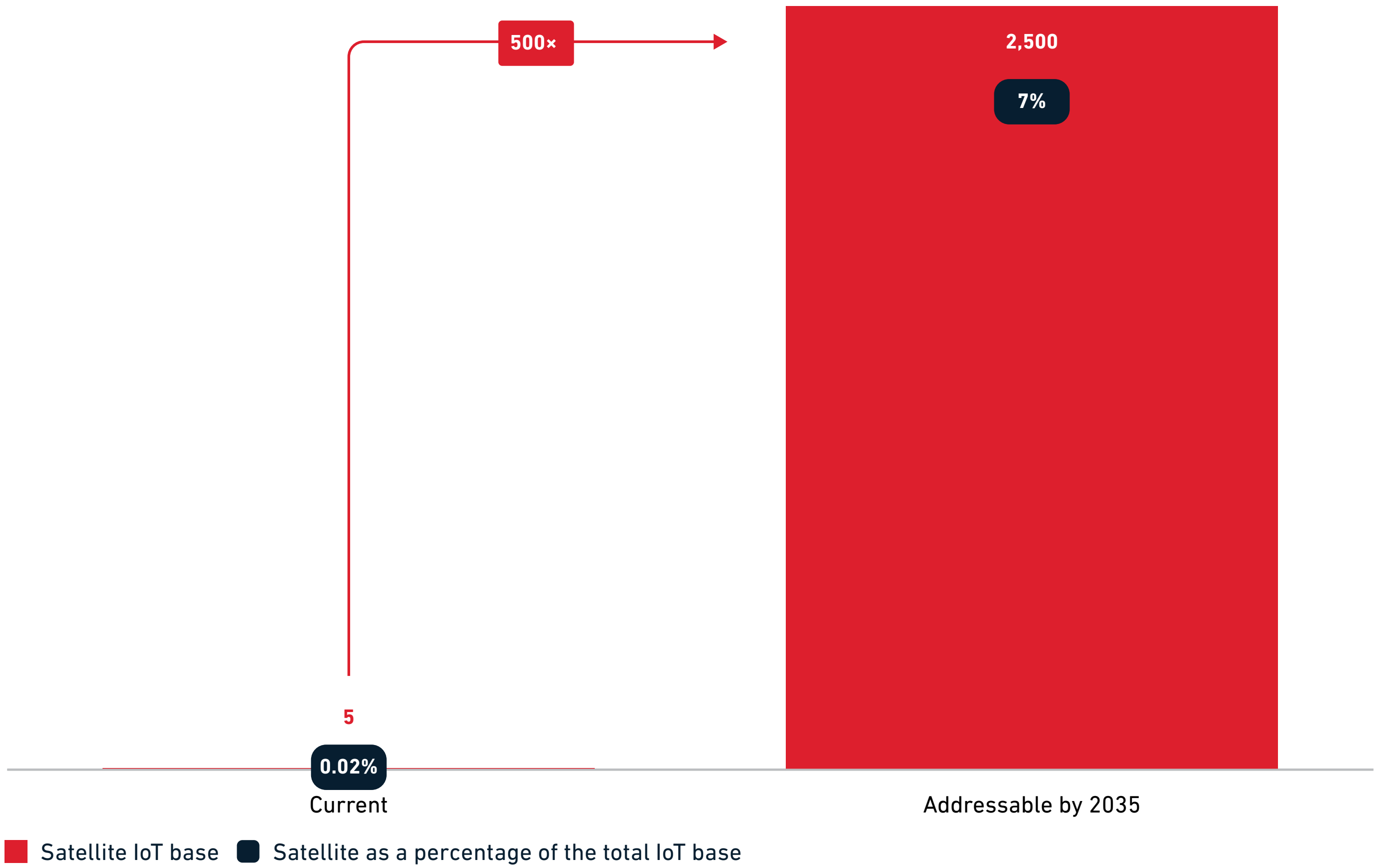
2026 is a key litmus test. High infrastructure costs, regulatory fragmentation (spectrum and licensing) and ongoing device standardisation challenges remain key obstacles that require collaborative industry efforts and innovative business models.

500× expansion available, but can it be realised?

- **500× increase on the table.** The current installed base of IoT devices connected to satellites is small, at approximately 5 million worldwide. This has not changed much over the last 15 years. NTN standards integration changes the addressable base by an order of magnitude through scale economies. GSMA Intelligence estimates 2.5–3.0 billion is a realistic addressable figure, or 5–10% of the global IoT base.
- **Volumes versus revenues.** The figures refer to what is addressable; they are not a hard forecast. Whether this materialises and to what extent will depend on network coverage, price competitiveness versus existing land-based options and integration. In the near term, ARPU rates will likely have to be ultra competitive to drive take-up, meaning most of the addressable revenue base ($10 billion by 2035) is backloaded.

The addressable scope for satellite IoT is an order of magnitude on current volumes

Satellite IoT base (million)



Source GSMA Intelligence

Satellites may be fancy, but this is about solving basic problems

- **Satellite IoT spans a range of use cases.** A GSMA Intelligence survey of enterprise purchasing managers indicates a range of use cases spanning equipment monitoring, asset tracking and environmental compliance, with each garnering 15–25% of first-place votes.
- **The basics trump the ‘razzle-dazzle’.** As much as satellite gets a high ‘cool factor’, businesses are more prosaic. Can it provide us with connectivity? Can it be relied upon? How much does it cost? The use cases here speak to these business needs. Those telcos and their satellite distribution partners that cater their product based on a customer-first mindset are most likely to succeed in commercial performance.

Enterprises want satellite connectivity to help with the basics

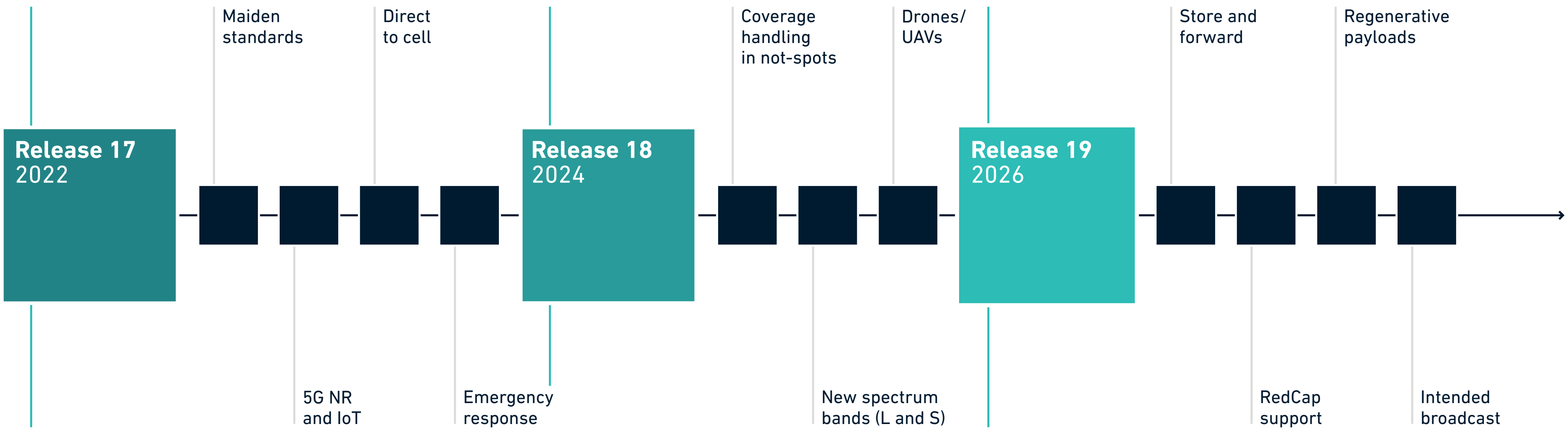
Which areas of your business are most likely to benefit from an expansion of data and insights provided by satellite-enabled industrial IoT devices? Percentage of enterprises

Source GSMA Intelligence survey on enterprise attitudes to satellite, May/June 2025

Standards prepare IoT for prime time

- **Release 19 is upon us.** Release 19 introduces improved specifications for NTNs, enabling more reliable, low-power, wide-area satellite IoT connectivity. This standardisation reduces technical barriers and ensures interoperability across different satellite operators, making it easier for chipset and device vendors to scale IoT solutions globally.
- **Go-to-market implications.** Companies can target previously underserved regions and verticals (e.g. agriculture, shipping, energy). This offers a go-to-market strategy that emphasises global reach, differentiated reliability, and integration with terrestrial IoT networks, potentially shortening sales cycles and creating premium service offerings.

Release 19 opens the door to bigger and better



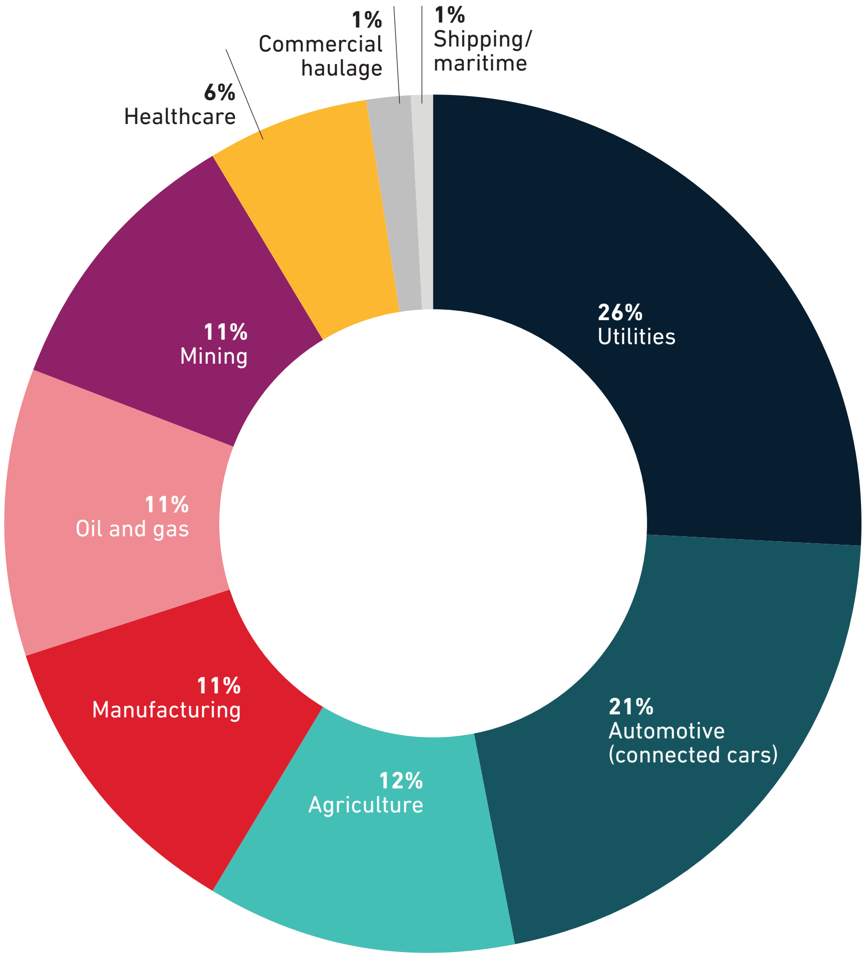
Source GSMA Intelligence

Verticals: it's not who is in play; it's who *isn't*

- **Multiple sectors addressable.** Satellite connectivity is in play for several industries. Energy and utilities providers (e.g. smart metering and weather monitoring) are the largest by virtue of their pervasive asset distribution. However, the automotive sector presents the largest revenue base given the cross-sell into existing cars with embedded infotainment systems that require seamless coverage and roaming. Globalstar's IoT offering is a good example that crosses multiple verticals, offering scale economies that help drive buyer cost down.
- **USPs in focus.** The unit economics of satellite IoT usually require an ARPU premium compared to terrestrial solutions. This should favour specialised companies (such as Skylo) that can leverage first-mover advantage, global coverage and brand strength.

A range of sectors are addressable for satellite

Share of addressable IoT device base for satellite in 2035

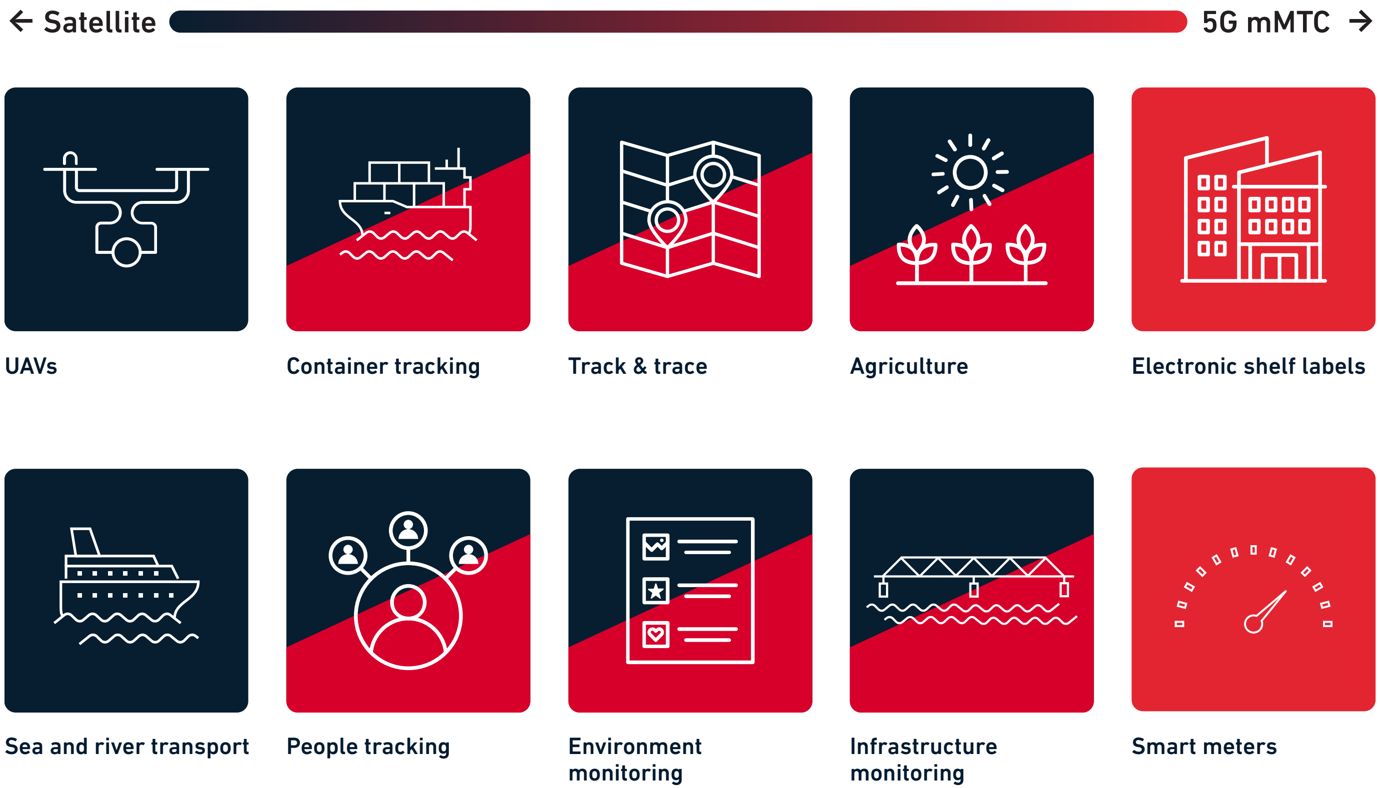


Source GSMA Intelligence

Satellites can complement the wider portfolio

- **It's not always binary.** Companies choose between satellite and cellular based on coverage, latency and reliability requirements. Cellular is preferred in urban or well-covered areas due to the lower costs and higher bandwidth. Satellite works for remote, maritime or airborne operations where terrestrial networks are unavailable. For example, drones in forest monitoring or offshore shipping fleets rely on satellite when out of cellular range, switching to cellular when back near cities or ports.
- **The advantage of hybrid.** Hybrid models allow companies to optimise costs and maintain continuous connectivity by leveraging whichever network is most efficient at a given location. Operators able to offer both are at a competitive advantage.

IoT installations and assets may be satellite-only or connected via hybrid set-ups



Source GSMA

Considerations for the year ahead

Watch the economics

- **Unit prices falling.** Economies of scale from LEO constellations, hybrid modules and standardised chipsets are driving down both module and service costs, making satellite IoT more viable for cost-sensitive use cases such as agricultural sensors and asset tracking.
- **The value of hybrid.** Multi-mode modules that support both terrestrial and satellite connectivity are becoming mainstream, further reducing the total cost of ownership for enterprise deployments. A key question is how many satellite groups – and telcos – offer a hybrid solution.

Standards can be sexy

- **Release 19 moves us closer.** With Release 19 bringing advanced NTN features such as regenerative payloads, improved link performance and deeper integration with terrestrial 5G, satellite IoT moves closer to seamless, standards-based global connectivity.
- **Value proposition impact.** The above should strengthen industry confidence, quicken certification cycles, and reduce fragmentation in chipset and hardware designs. The commercial impact, however, will depend on perceived customer value.

Winning in go-to-market strategy

- **Targeting to accelerate adoption.** By tailoring offerings to sectors needing ubiquitous coverage and predictable costs (such as logistics and shipping), satellite groups and telcos can accelerate adoption while leveraging hybrid connectivity to mitigate terrestrial coverage limitations.
- **Ultimately, scale is required.** Globalstar and Skylo are two leaders in satellite IoT. Their performance will act as bellwethers for the broader sector. The scale question will be pressing for smaller companies, particularly when competing in lower ARPU verticals (such as smart metering).

Energy innovation

Changing models in an AI world

GLOBAL MOBILE TRENDS

Energy innovation

News highlights

Why it matters

AI is reshaping energy demand across digital infrastructure

Collaboration between industries looks to enhance efficiency and promote sustainability

Operators shift from static to AI-native energy optimisation

Operators are enhancing energy efficiency throughout their networks

Operators are becoming critical enablers of energy efficiency

Considerations for the year ahead

☆ News highlights from the last year

Investments focused on enhancing energy efficiency through AI matured in 2025 and began to deliver tangible results.

JANUARY

Qualcomm's AI-driven energy-saving optimisation

Qualcomm conducted AI-driven, four-dimensional energy optimisation in the multi-vendor network of a tier-1 Asia Pacific mobile operator to control increasing electricity costs and maximise energy efficiency while maintaining user experience.

MARCH

China Mobile's intelligent energy-saving deployments

The initiatives in Chengdu covered locations such as shopping malls, supermarkets, high-speed railways, hospitals, stadia and suburban areas. The technologies included ultimate dormancy, intelligent circuit breakers, millisecond-level channel shutdown and sub-second-level carrier shutdown.

APRIL

Ericsson and Bell Canada field-test AI-native link adaptation

The first global live test shows up to +20% downlink and +10% spectral efficiency, signalling how AI-RAN can cut energy per bit through smarter radio decisions.

APRIL

Turkcell's AI-assisted sector shutdown

Turkcell has developed an AI-assisted sector shutdown algorithm that identifies low-traffic sectors, enabling safe shutdowns while maintaining uninterrupted service.

APRIL

Telenor's autonomous AI agent with Ericsson

The solution demonstrated reduced network energy consumption without negatively impacting network quality. In a simulated environment, the AI agent achieved a 4% energy consumption saving for the L26 radio cell, with time in active sleep mode increasing from 4 to 7 hours, on average.

MAY

Saudi Arabia and Nvidia unveil AI factory plan (up to 500 MW)

Saudi Arabia has partnered with Nvidia and Humain to build sovereign AI infrastructure, bringing energy-dense AI campuses into the mainstream.

JULY

Indosat Ooredoo Hutchison automates radio idling

A nationwide AI solution now idles radios automatically at low demand, delivering material RAN energy savings while sustaining performance. It is delivered via the cloud.

OCTOBER

Globe Telecom cuts nationwide RAN energy use

Globe Telecom reported a nationwide RAN energy reduction of up to 5.5% in seven months after deploying Qualcomm's AI-driven Dragonwing RAN Automation Suite across a multi-vendor, multi-generation network.

Source Company press releases

Why it matters in 2026

AI and energy: two key topics shaping each other

Energy efficiency continues to be crucial to positioning

A competitive edge. Despite changes in geopolitics, energy efficiency remains a hot topic. Rising network energy costs and climate scrutiny mean operators that lead in efficiency will gain a competitive edge in terms of margins, ESG leadership and customer preference.

A core differentiator. As data traffic grows, the gap between efficient and inefficient operators will widen, making energy performance a core differentiator in tenders, partnerships and regulatory positioning.

Energy management relies heavily on data

Data is essential. Energy-related decisions now rely on vast, granular data sets (e.g. site-level loads, traffic heat maps, cooling status, renewable availability), making data quality and integration essential to avoid costly optimisation mistakes.

Unlocking optimisation. Operators able to unify operational, environmental and cost data will unlock continuous optimisation cycles, moving from reactive fixes to predictive, automated efficiency improvements at scale.

AI is designed to enable rapid decision-making on a huge scale

Delivering savings. AI enables near-real-time optimisation across millions of network parameters – far beyond human capability. This helps deliver energy savings precisely when and where demand fluctuates.

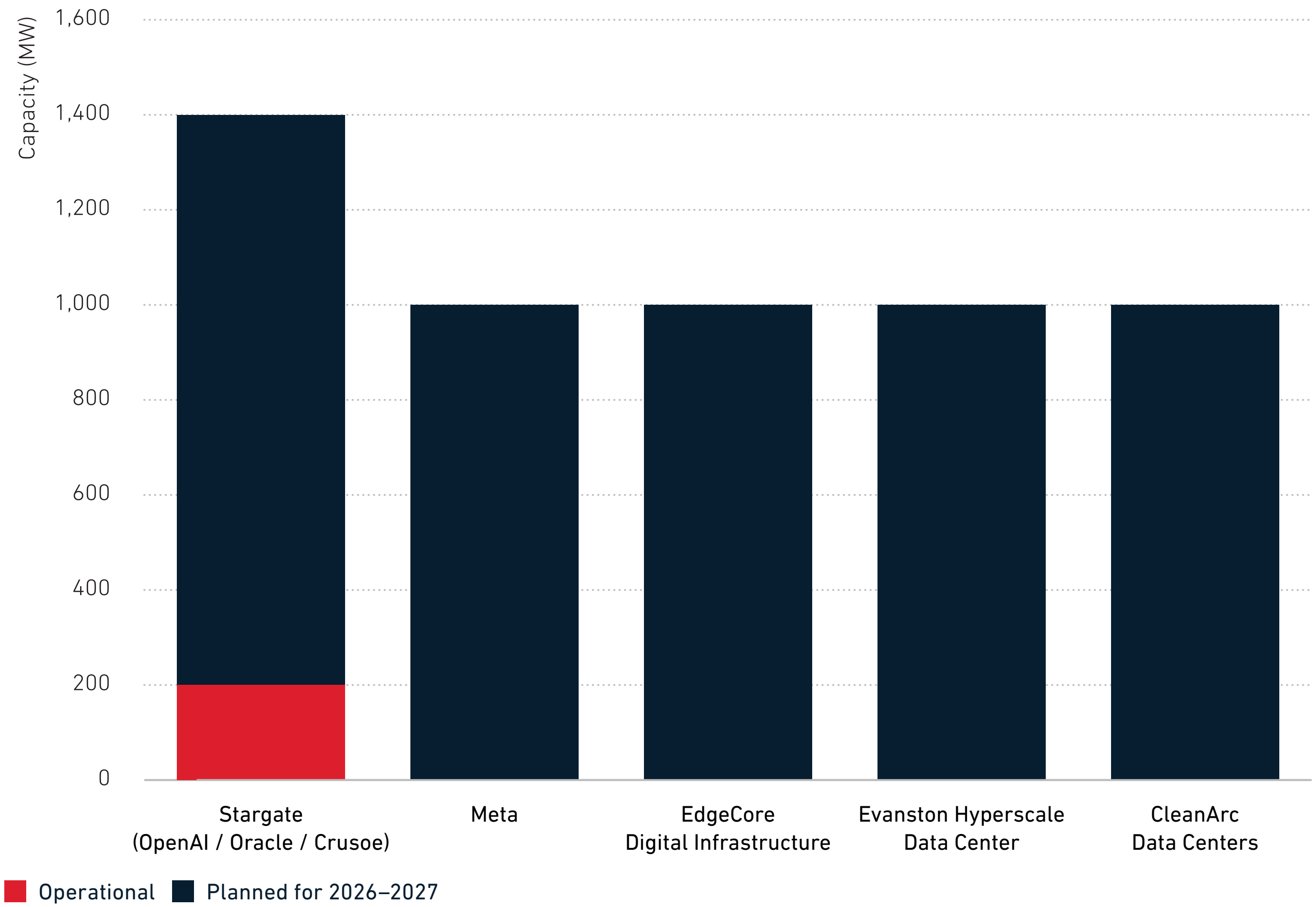
Compounding the gains. As models mature, decision automation will shift from isolated use cases (sleep modes, cooling, traffic steering) to full network orchestration, compounding energy-efficiency gains across RAN, transport and core.

AI is reshaping energy demand across digital infrastructure

- **AI drives demand.** AI-driven workloads in data centres are driving unprecedented electricity demand, with global data-centre use forecast to more than double by 2030.
- **Data-centre builds expand.** The global build-out of gigawatt-scale data centres is accelerating rapidly, with five campuses of 1 GW or more now announced.
- **Supporting the next era of infrastructure.** A structural shift is underway towards AI-optimised mega-campuses that concentrate unprecedented power demand in a small number of locations. Their emergence underscores the need for coordinated, long-term energy planning, including nuclear power purchase agreements, grid reinforcement and behind-the-meter generation to support the next era of AI-driven digital infrastructure.

A growing number of 1 GW data centres, reflecting the trend to ultra-large-scale digital infrastructure

Global ≥1GW data centre pipeline, 2025–2027



Source GSMA Intelligence

Collaboration between industries looks to enhance efficiency and promote sustainability

- **Data centres as heat sources.** Data centres are integrating with heating systems, using the heat generated by the data centres to warm apartments and offices. Nordic countries are leading the way in this area.
- **Move to cross-sector collaboration.** Power and telecoms systems are now interdependent, requiring shared rules, data frameworks and coordinated planning. Global coalitions (from Open Power AI to the GSMA) and operator working groups are emerging to guide responsible AI deployment.
- **Governance and interoperability are enablers.** Clear governance and interoperability are increasingly viewed as prerequisites to scale energy-AI innovation.

Cross-industry collaboration on excess heat: examples

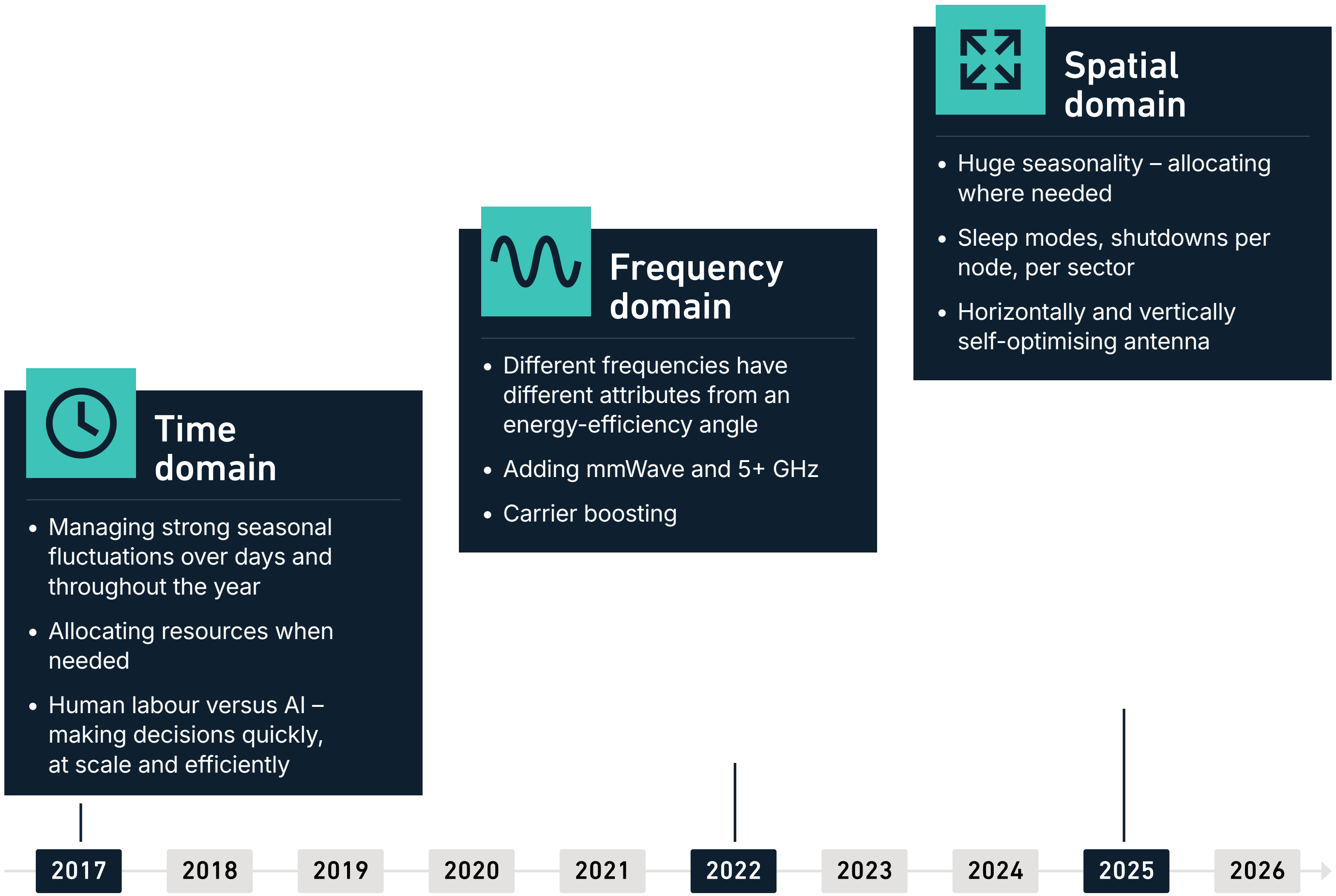
Country	Partner	Project	Summary
Denmark	**Meta**	Large-scale district heating network	In Odense, Denmark, Meta's data centre feeds its waste heat into ammonia heat pumps that supply hot water to a district heating network capable of heating thousands of homes.
France	**Qarnot Computing**	Reusing excess heat to warm buildings	Instead of letting the enormous heat produced by servers go to waste, some data centres capture and redirect it to local heating systems. In Bordeaux, France, 6,000 square meters of space is fully heated by this heat.
US	**National Renewable Energy Lab**	Campus-wide heat reuse	Waste heat from supercomputers and servers is captured with a water loop and used to heat offices and labs, achieving extremely high efficiency.
Germany	**Deutsche Telekom**	Cloud and heat	Deutsche Telekom devised a solution to reduce the CO_2 emissions of data centres by 41%. Through a cooling system with direct hot-water cooling and waste heat recovery, the heat is dissipated and fed into the hot water circuit of the building for reuse.

Source GSMA Intelligence

Operators shift from static to AI-native energy optimisation

- **Shift to AI-driven dynamic power management.** Operators are moving beyond fixed, time-based shutdowns to AI systems that learn real traffic patterns (hourly, daily, seasonal) to dynamically power down or activate network elements. This delivers more reliable savings, as AI anticipates demand rather than reacts to it.
- **From static to reactive network optimisation.** Traditionally, frequency layers and sector behaviour were configured through static rules. AI now optimises spectrum layers and power levels in real time based on local congestion, propagation and device mix.
- **Spatially adaptive, demand-aware RAN.** In the spatial domain, AI allocates resources per site, sector and beam, activating or idling capacity where demand exists. This turns the RAN from a uniformly powered grid into an adaptive, demand-aware system that minimises unnecessary energy use.

A decade of AI advancements in energy efficiency

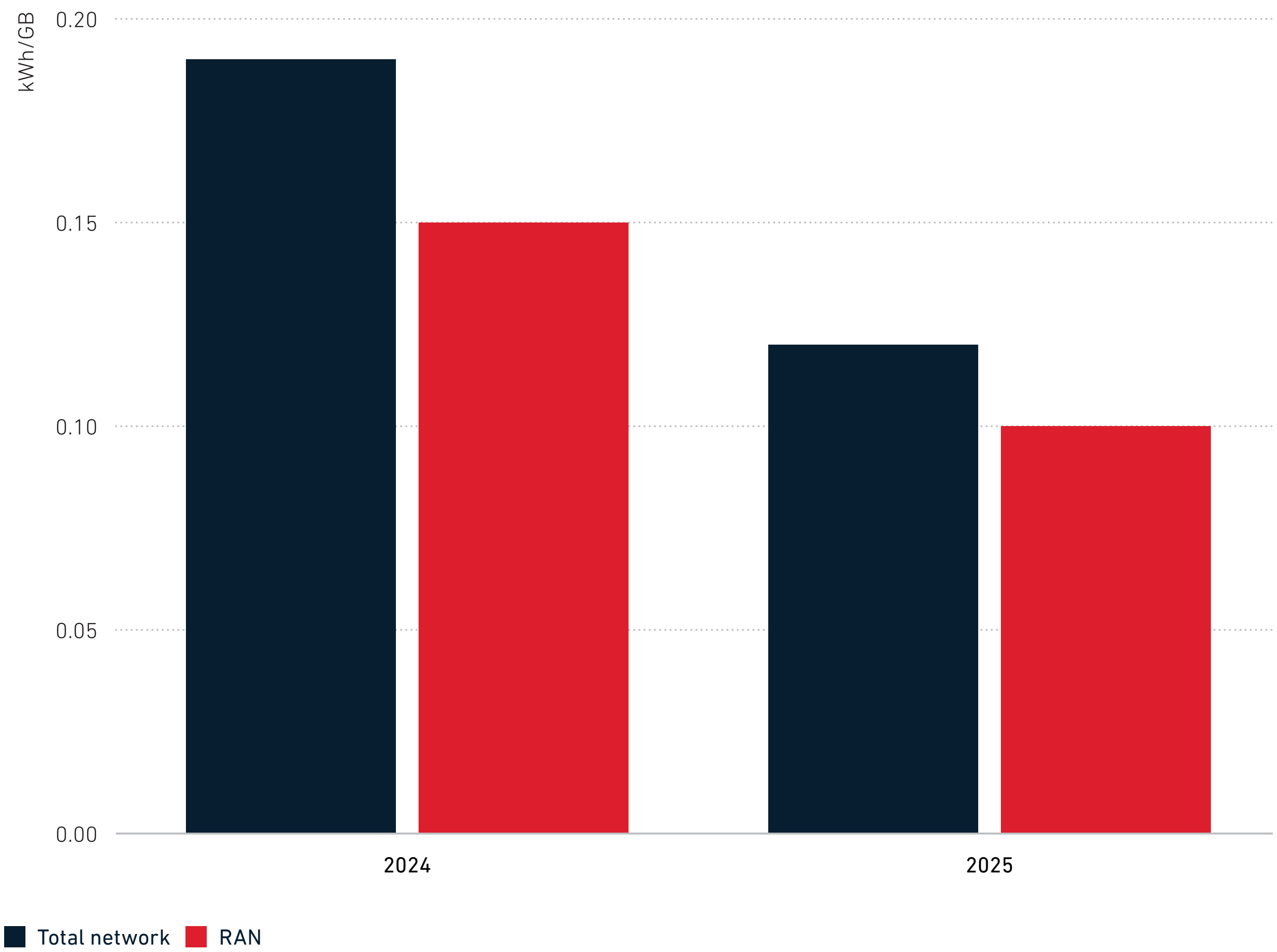


Source GSMA Intelligence

Operators are enhancing energy efficiency throughout their networks

- **Energy efficiency becomes a repeatable operating discipline.** GSMA Intelligence's energy-efficiency benchmarking shows clear progress over the past two years, with more operators reporting lower kWh/GB yields and scaling up AI-driven optimisation from pilots to production. Efficiency is moving from isolated initiatives to a repeatable operating discipline.
- **AI-enabled efficiency gains across the whole network.** Telecoms operators are consistently improving energy efficiency by adopting and maturing AI-driven optimisation across RAN, core and data-centre domains. This enables reductions in power consumption even as traffic grows.
- **Continuous optimisation to counter rising AI-driven demand.** Continuous efficiency gains, such as dynamic power management, advanced cooling optimisation and smarter traffic steering are essential to offset rising energy demand from emerging AI workloads.

Energy efficiency has improved at the whole network and RAN levels



Source GSMA Intelligence Telco Energy Benchmark 2024 (65 mobile networks) and 2025 (95 mobile networks)

Operators are becoming critical enablers of energy efficiency

- **Operators evolve into AI-era infrastructure enablers.** Telecoms networks are increasingly becoming the backbone for AI growth, with operators evolving from connectivity providers to AI enablers through investments in 5G SA, edge compute and intelligent transport networks.
- **Modernised networks as the foundation for scalable AI ecosystems.** As AI workloads rise, operators need to modernise network architectures to support ultra-low-latency and high-capacity applications while managing higher energy intensity. This shift positions operators as foundational players in scaling AI ecosystems across industries.

Examples of network operators enhancing energy efficiency in other industries

Project	Description
Operators offer IoT-based energy management systems for building management	Operators supply IoT smart meter connectivity, real-time monitoring and remote-control systems that automate appliance usage during low-tariff periods. This helps energy utilities and households optimise consumption. Remote IoT-based demand management can deliver 10–20% electricity savings for buildings and consumers.
Operators enable efficient grid operations via IoT and predictive monitoring	Connected IoT sensors (via 4G/5G) allow utilities to monitor demand, detect faults faster and optimise grid balancing. Operators also cut energy consumption in their own grid-integrated sites through network optimisation, making connected grid services cheaper and greener. Network-level optimisation enables significant reductions in telco energy opex, improving the cost-to-serve for smart grid communications and enabling more efficient load management in electricity networks.
Operators offer AI-optimised network connectivity for transport systems	Transport systems depend on continuous mobile connectivity. As one example, Telenor uses AI-powered algorithms to optimise how radio resources are used, reducing the overall energy cost per transported bit. More efficient network use lowers the energy required for real-time transport applications (e.g. connected buses, trains).

Source GSMA Intelligence

Considerations for the year ahead

Hyperscale AI redraws the power map

- **Balancing near-term cost wins with new revenue plays.** Most telco AI programmes today target internal efficiency, but new revenue models are emerging, such as GPU-as-a-service, localised AI infrastructure, and AI-native network features. A two-speed roadmap is possible: locking in opex savings now while also incubating commercial offers.
- **De-risking with proofs and benchmarks.** AI energy savings (e.g. RAN optimisation) should be tied to capex/opex business cases and SLA outcomes. This keeps the programme investment-grade while accelerating rollout across markets.

Operators focus on talent, data and governance to scale energy AI

- **Breaking down silos with horizontal O&M.** Network operators should build cross-functional squads (networks, IT, security, sustainability) with MLOps, model governance and clear decision rights, and accelerate via structured vendor/operator workshops and external benchmarks. This turns point solutions into repeatable capabilities.
- **Making energy data AI-ready.** Focusing on sites and platforms with the KPIs that matter (e.g., PUE, TEEI, per-site intensity) and high-fidelity telemetry can help operators drive closed-loop optimisation at scale. The groundwork unlocks 'apples-to-apples' vendor comparisons and sustained savings.

Passive infrastructure: no such thing as excess heat

- **Designing for flexibility and heat reuse.** With AI's greatest energy impact in data centres, operators can use demand response, storage and thermal recovery to create cost and emissions headroom, while network-side efficiency continues in parallel. This positions operators to scale AI without breaching energy or carbon constraints.
- **Go big; plan big.** Gigawatt-scale AI workloads concentrate demand, making long-term PPAs, grid reinforcement and behind-the-meter generation part of roadmap planning.

eSIM

The time is right to push adoption

GLOBAL MOBILE TRENDS

eSIM

☆ News highlights

ⓘ Why it matters

China and Apple: two milestones that should help accelerate eSIM adoption

eSIM penetration will double in 2026 globally, but regions will move at different speeds

Travel eSIM is on the rise, spurred by unprecedented competition and innovative propositions

Record investor funding speaks to the potential of eSIM, with travel and IoT driving deals

Recent enhancements to eSIM specifications will drive renewed interest in eSIM for IoT

Considerations for the year ahead

☆ News highlights from the last year

2025 was a remarkable year, with China launching eSIM service for smartphones, Apple going eSIM-only globally, and strong momentum behind travel eSIM.

MARCH

Eolo partners with Thales for eSIM FWA

Eolo (an FWA provider in Italy) partnered with Thales to expand high-speed internet access in the country through eSIM FWA, with a focus on underserved Italian communities.

APRIL

Odido introduces SimWallet for temporary connectivity

Odido introduced SimWallet via eSIM – an app that allows consumers to purchase temporary access to Odido's 5G network and use unlimited data for a fixed time (e.g. one day, a couple of days or a month).

JUNE

Vodafone launches new eSIM digital travel platform

Vodafone launched its travel eSIM global offering (for 206 countries), providing users of any network (not just Vodafone) with mobile data connectivity while travelling.

JULY

Airalo becomes a 'unicorn'

Airalo (a global provider of travel eSIM) became a 'unicorn' after raising $220 million in a funding round led by private equity firm CVC. Airalo was valued at more than $1 billion after the July funding round.

SEPTEMBER

Apple goes eSIM-only globally

Apple launched eSIM-only smartphones worldwide (iPhone Air) and expanded the list of eSIM-only countries to 12 markets (mostly in North America and the Middle East).

OCTOBER

China launches eSIM service for smartphones

China's three largest mobile operators launched commercial trials for eSIM smartphone services, after receiving regulatory approval.

DECEMBER

Holafly launches global eSIM data plan

Holafly launched its eSIM permanent global data plan, covering 160 countries. Instead of installing multiple regional eSIMs, users only need to install one eSIM and then pay a flat monthly subscription.

DECEMBER

Revolut starts offering eSIM mobile plans

Revolut started rolling out Revolut Mobile to waitlist customers, with general access available in January 2026. The eSIM-based service is managed within the Revolut app.

Source Company press releases

Why it matters in 2026

After a slow start, eSIM adoption is set to accelerate

No more waiting

Time to scale up. Contrary to initial ambitions and forecasts, adoption of eSIM has been slow. No single issue is to blame, but recent developments from China and Apple, alongside the rise of travel eSIM, offer a favourable environment for acceleration in 2026.

(More) customers will demand it. Consumer awareness of eSIM has reached 60%, with half interested in using eSIM. Alongside the success of travel eSIM, this should boost consumer demand for eSIM in 2026. A similar trend could happen in IoT, where more enterprises will seek to capitalise on the benefits of enhanced eSIM specifications.

More pressure on operators

Commercialisation versus promotion. Over two thirds of MNOs have launched eSIM service for smartphones, but they have so far not done much to promote eSIM. Only 8% of eSIM-aware consumers have discovered eSIM via MNOs. The time is right to start promoting eSIM at scale, including eSIM-first strategies for onboarding new customers.

Greater focus needed. This includes launching the service (for the ~30% of MNOs who have not), conducting more consumer education, enhancing eSIM onboarding/activation, and exploring new opportunities for travel eSIM.

Taking travel eSIM to the next level

Shifting travel connectivity. Travel eSIM (the most successful new use case so far) has become a competitive field, with global providers (e.g. Airalo, Holafly) gaining customers, new entrants from the non-telco world (e.g. fintech), and major operators responding with global offers. 2026 will see new records set in terms of usage.

Pricing versus innovation. While pricing will continue to be a main factor, part of competition will shift from pricing to user experience through innovative propositions targeting customer longevity (not a one-off service) and bundles with digital platforms.

China and Apple: two milestones that should help accelerate eSIM adoption

- **It finally happened.** Two much-anticipated milestones were reached in late 2025, helping boost adoption. In September, Apple launched its first eSIM-only phone worldwide (iPhone Air). In October, China's three largest mobile operators launched commercial trials for eSIM smartphone services, after receiving regulatory approval.
- **Why are they important?** A previous eSIM vendor survey revealed that both events were two of the top four factors that could accelerate consumer adoption of eSIM. China launching the service is particularly important given the scale of the market and the country being home to many major OEMs.

Two major milestones are set to accelerate eSIM adoption

Ranking of factors that could accelerate eSIM adoption in the smartphone market

1. MNOs and MVNOs doing more to promote eSIM to their customers
2. **OEMs pushing eSIM more, including eSIM-only phones**
3. A significant acceleration in travel eSIM adoption
4. **China launching eSIM service for smartphones**
5. More operators launching consumer propositions centred on eSIM (including digital brands) and new eSIM use cases
6. Enhanced user experience for eSIM activation/onboarding

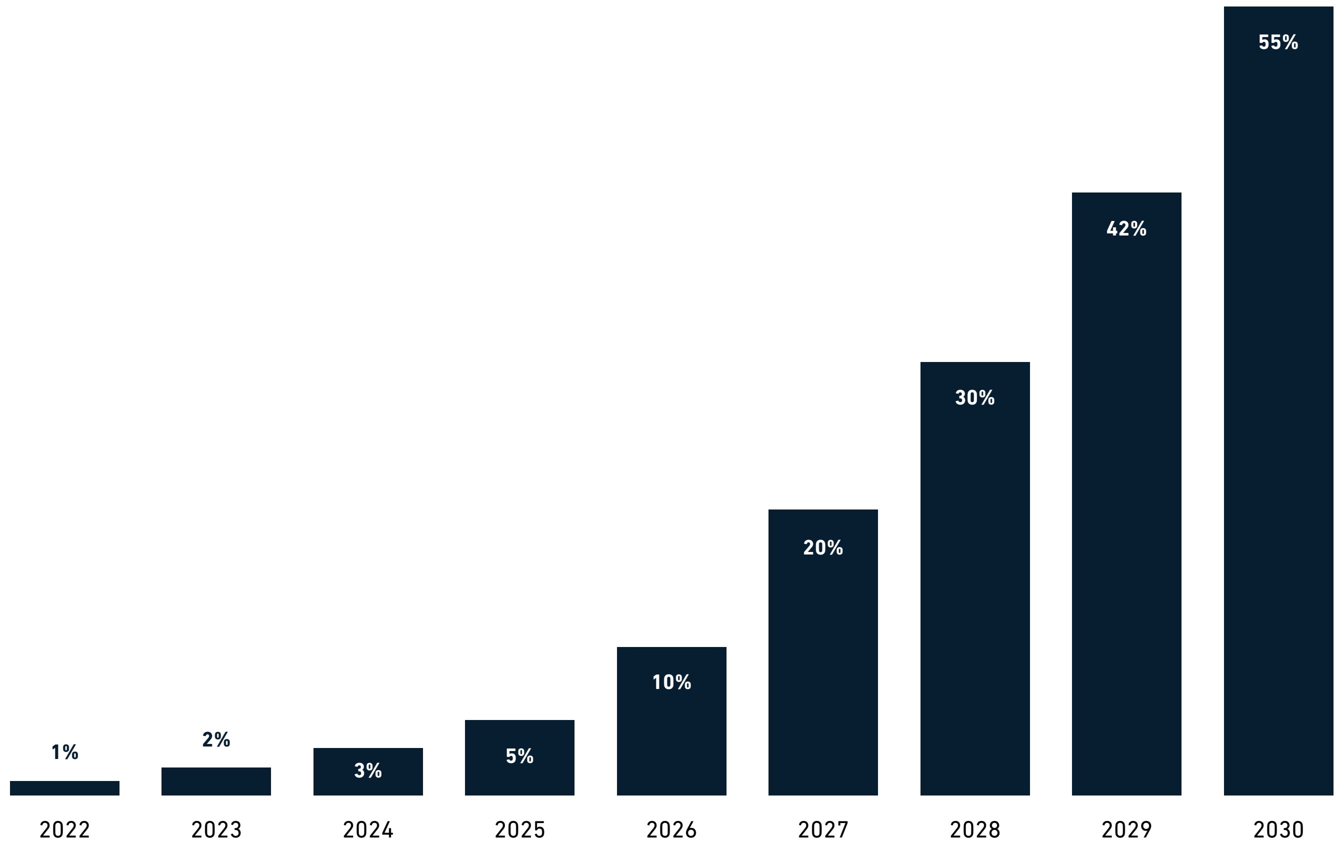
Source GSMA Intelligence eSIM vendor survey

eSIM penetration will double in 2026 globally, but regions will move at different speeds

- **Expectations versus reality.** At the end of 2025, eSIM penetration stood at 5% of smartphone connections globally, with nearly 40% of eSIM users in the US, where the launch of eSIM-only iPhones in 2022 has boosted adoption to 40%. While no one expected global adoption on a par with the success seen in the US, 5% is a fraction of the forecast made six years ago for 2025.
- **Acceleration on its way.** Global eSIM smartphone connections will double between 2025 and 2026 (10% penetration), reaching 4.9 billion by 2030 (55%). North America will be the first region to reach 50% penetration (in 2027), followed by Europe (2029). Developing countries will move more slowly.

After a slow start, eSIM adoption in the smartphone market is (finally) set to accelerate

eSIM connections as a percentage of total smartphone connections (installed base)



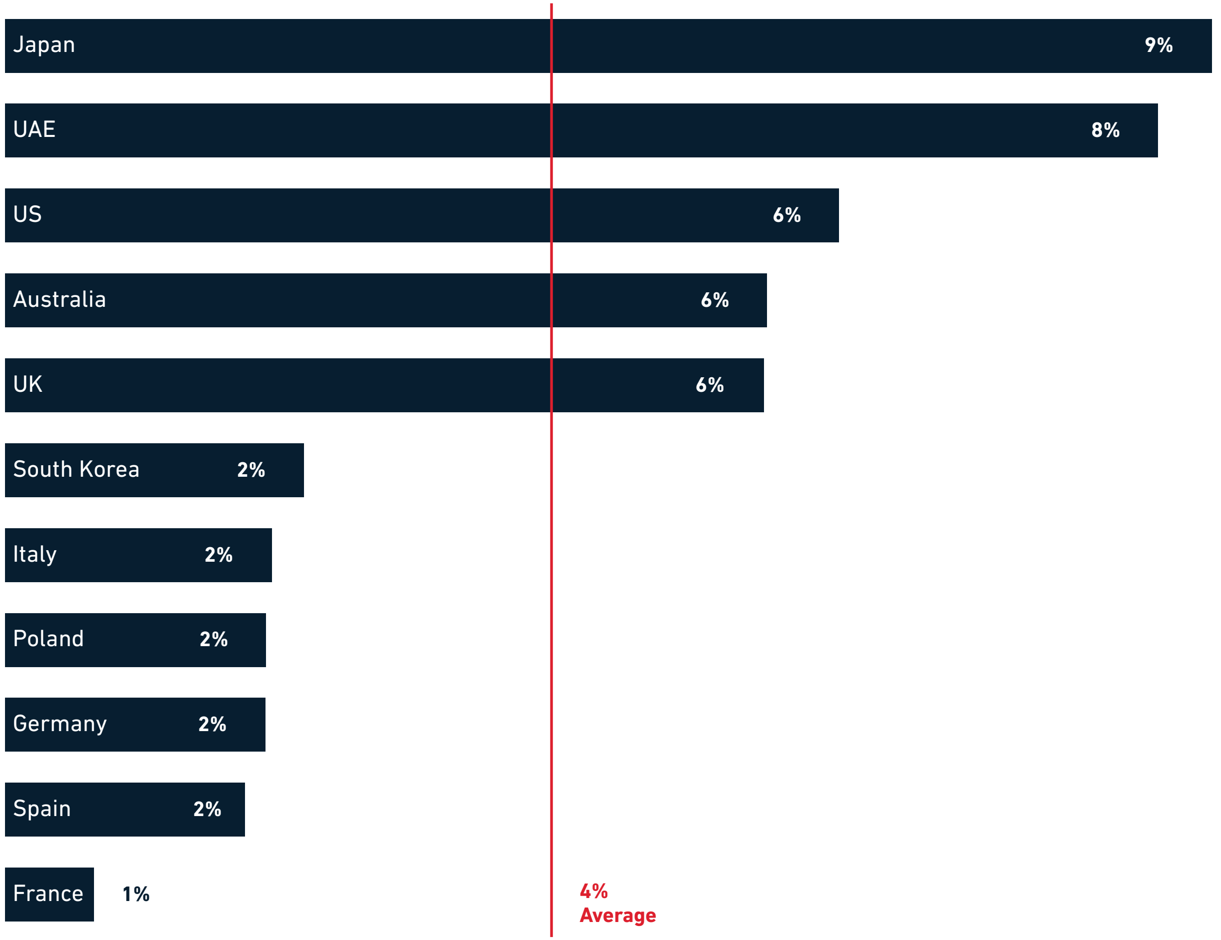
Source GSMA Intelligence

Travel eSIM is on the rise, spurred by unprecedented competition and innovative propositions

- **Clear benefits.** Travel eSIM has emerged as a successful use case. It supports expanded use of mobile connectivity when travelling (consider 'silent roamers', for example), delivering the true concept of mobility everywhere.
- **Adoption on the rise.** On average across 11 countries surveyed, 12% of consumers who took international trips in the past 12 months used eSIM while travelling abroad. Four percent used a travel eSIM service provided by a global provider of travel eSIM services (e.g. Airalo, Holafly).
- **Competition is growing.** With global providers, MNOs and non-telco companies, competition is heating up. While this is good news for consumers, balancing price competition and service innovation will be key to deliver extra value.

Use of travel eSIM by consumers is on the rise

Use of eSIM service while travelling abroad with service being provided by an international provider of travel eSIM services (e.g. Airalo, Holafly). Percentage of consumers. Base is consumers who have taken international trips in the past 12 months.



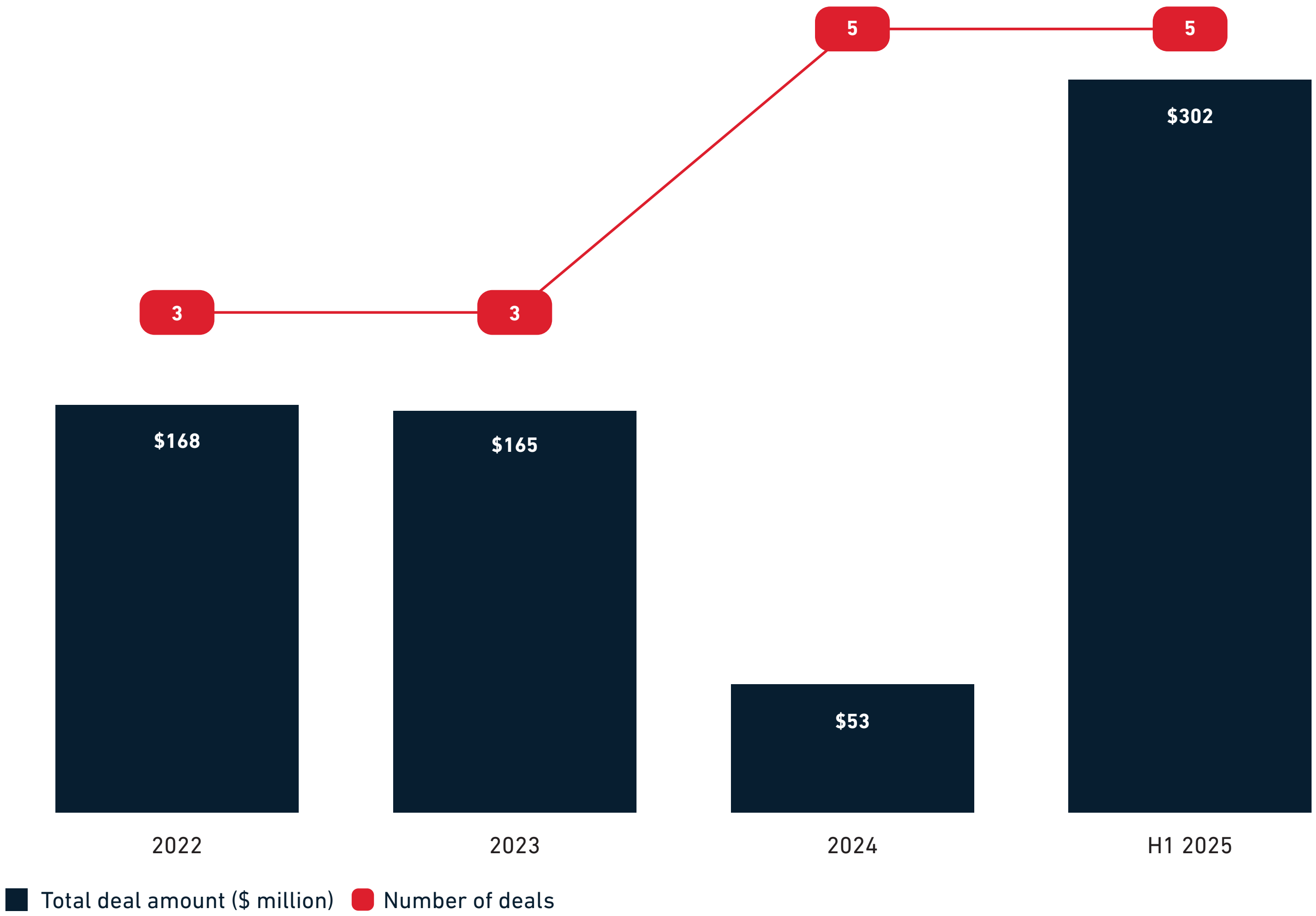
Source GSMA Intelligence Consumers in Focus Research: Global Consumer Survey August 2025

Record investor funding speaks to the potential of eSIM, with travel and IoT driving deals

- **Record funding.** Since 2022, eSIM has captured deals worth almost $700 million, with an acceleration in 2025. While Airalo secured the biggest deal (becoming a 'unicorn'), 1NCE and Kigen also got new funds, confirming investor interest in eSIM for IoT.
- **Important support at the right time.** Growing funding (a trend likely to continue in 2026) is good news for the wider eSIM ecosystem. It helps encourage tech and service innovation (much needed, especially on new use cases).
- **Operators should do more.** Their involvement has been low so far. However, part of eSIM success will come from exploring and launching new use cases not possible with the traditional SIM, and startups are fit for purpose for fostering innovation.

2025 the strongest year ever for eSIM investor funding

Number of deals involving eSIM business and total deal amount (million). Excludes deals where deal amount is unknown. Base: deals worth $5 million or more.



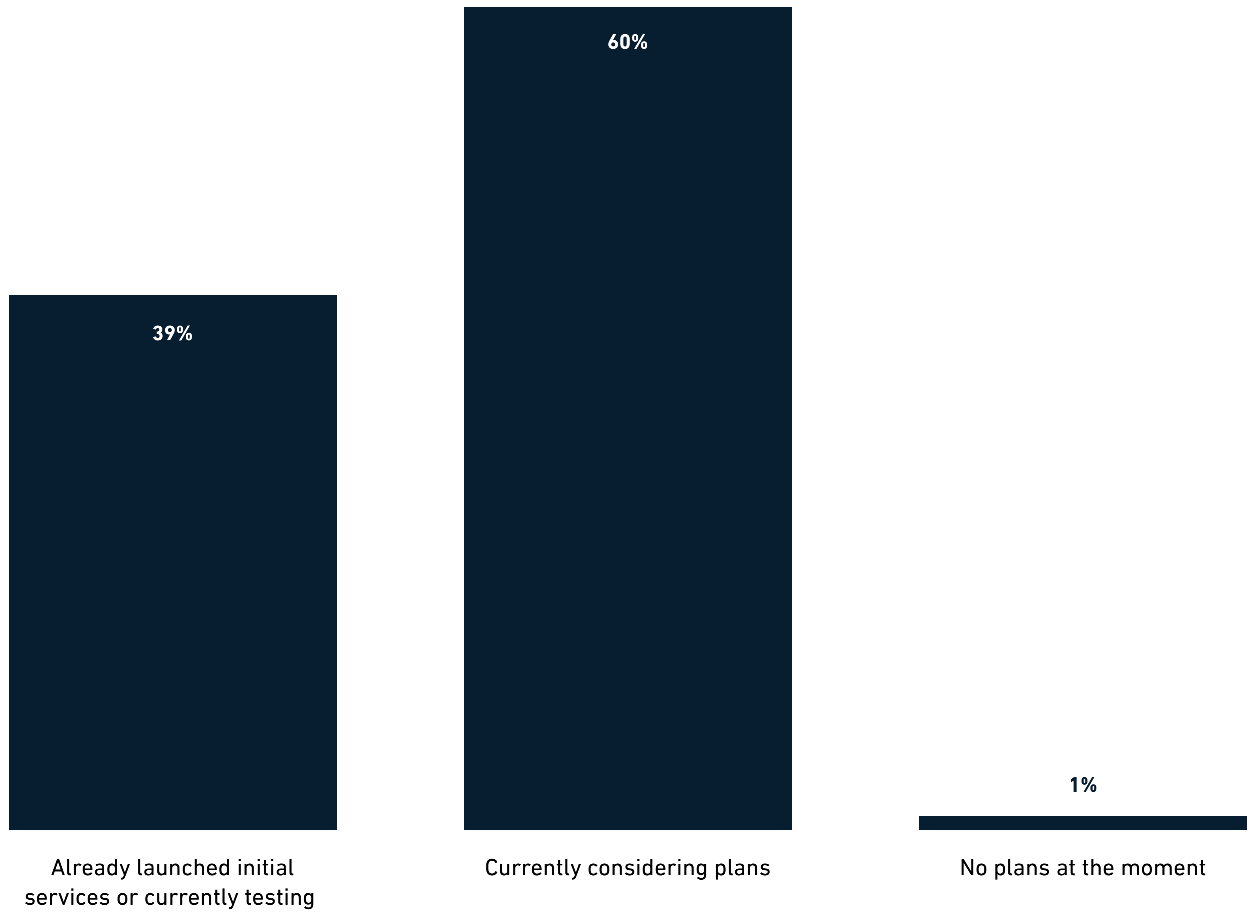
Source GSMA Intelligence based on CB Insights data

Recent enhancements to eSIM specifications will drive renewed interest in eSIM for IoT

- **Scaling beyond automotive.** In the enterprise IoT market, eSIM is mainstream in connected vehicles, but adoption has yet to reach a critical mass outside of automotive.
- **Specifications versus challenges.** Enhancements on eSIM specifications (SGP.32 and further releases) should help drive eSIM adoption, but helping enterprises address deployment challenges such as cost of implementation and technology integration will be key to unlock new business opportunities.
- **Operators seem keen.** Only a few operators have launched initial IoT services that leverage SGP.32, but this grows to around 40% when including testing – a promising sign for future deployments.

Operators are making inroads in SGP.32

Operators' current approach to commercialising IoT services that use the new GSMA eSIM SGP.32 specifications.
Percentage of respondents



Source GSMA Intelligence Operator Survey December 2025

Considerations for the year ahead

Areas of focus for OEMs

- **eSIM-only should be on the radar.** While it is difficult to predict if other vendors (beyond Apple and Google) will launch eSIM-only phones in 2026, at the very least, all OEMs will need to consider the implications of eSIM-only devices to their business and consider timelines for the transition.
- **Mainstream versus niche.** While many flagship smartphones are eSIM-enabled, eSIM availability remains low beyond flagships. A wider portfolio, including mid-range and low-end models, is needed in 2026 to drive eSIM adoption, especially in developing markets.

Areas of focus for MNOs

- **Target the business market.** Business eSIM offers MNOs a way to target larger volumes of eSIM users through a single eSIM/5G connectivity/device contract framework. It also boosts consumer adoption, as employees become familiar with eSIM and may want to switch to eSIM for their personal smartphone.
- **Regard travel eSIM as incremental business.** Competing head-on with low-cost travel eSIM solutions could cannibalise traditional roaming revenues. Regardless, some MNOs see value in capturing some revenues rather than none at all, and in tapping into revenue streams that simply may not have existed otherwise.

All players: exploring new use cases

- **eSIM beyond core.** Since the arrival of eSIM, the quest for new use cases has been constant in the industry, but success has been mixed. Efforts will need to intensify in 2026, with FWA, wearables and on-demand temporary connectivity offering some opportunities.
- **Temporary connectivity a trend to watch.** This concept is not new (e.g. roaming services) but is expanding, as eSIM makes network access faster (e.g. within minutes). The opportunity for MNOs lies in tapping into non-customers and temporary use cases (e.g. linked to events).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