Policy Brief 2026

Connectivity for European Strategic Autonomy

Telefónica

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1.

Executive Summary: Connectivity for Strategic Autonomy

Europe is at a turning point for its digital future. Connectivity is entering a new phase. The linear value chain that was once led by telecommunications operators, has become an interdependent network of players and technologies. High-capacity fibre and 5G networks, cloud and edge computing, artificial intelligence, submarine cables, and low-orbit satellites are all transforming the way we communicate, interact and innovate. Connectivity is no longer merely infrastructure; it is a key element of competitiveness and strategic digital autonomy.

While this change opens up new opportunities, it also poses challenges. The distinction between networks and services is becoming increasingly blurred. Cloud computing is moving closer to the end user through the edge, relying on telecommunications infrastructure. Operators are adapting by migrating to cloud-native models and opening up their networks through initiatives such as Open Gateway. The result is a smarter, more flexible architecture capable of supporting industrial automation or real-time applications serving people and businesses.

This dynamism has attracted new players and business models that are transforming the value chain. Large technology companies, cloud providers, infrastructure companies and satellite operators have entered spaces previously managed by telecommunications operators, concentrating market power and capturing a significant share of the ecosystem´s value. In this context, European operators are adjusting their strategies. They are exploring more flexible OpEx-based business models, divesting from infrastructure to gain agility, creating alliances with investment funds to accelerate the rollout of fibre and 5G, and cooperating with large technology companies on hybrid cloud and IoT solutions.

However, this evolution highlights structural imbalances. Although all players benefit from the underlying infrastructure, not all operate under the same rules. The current fragmented and compartmentalised framework creates imbalances between segments of the new connectivity value chain.

Updating this regulatory framework is essential. Europe needs connectivity governance that takes technological convergence into account and develops horizontal principles that apply equally to all players, regardless of their origin. Priorities include a fair spectrum policy that encourages investment and the creation of dispute resolution mechanisms between operators and large technology companies.

It is also necessary to modernise EU competition policy, adapting it to the new reality. This involves reviewing the thresholds and criteria for merger control, incorporating an industrial and strategic vision, and orienting regulatory remedies towards investment objectives, efficiency in terms of consumer welfare and strategic autonomy, avoiding distortions that artificially favour new entrants.

This document analyses the transformation of connectivity and its structural imbalances, offers a diagnosis of the current challenges and proposes concrete lines of action to build a more balanced, sustainable and competitive model. In short, it sets out a roadmap for strengthening the strategic role of telecommunications in Europe's digital autonomy.

Figure 1. Connectivity has changed; the rules must change too

	From telecom connectivity...	...To a new era of connectivity
Players	Telecom Operators • Fixed • Satellite • Mobile • MVNOs • Cable	Telecom Operators Content and App Providers Cloud Providers Satellite Providers Infra Wholesalers Industry Verticals
Disruptive Innovation	Fixed Broadband (from Copper to Fibre) Mobile Broadband (from 2G to 5G) Digital Voice & Data (from Analogue to Digital)	Ultra-broadband (5G SA, Fibre) Programmable Networks (SW defined, APIs, NaaS) Cloud computing Edge Computing 5G Network Slicing AI and quantum safe networks Direct-to-Device (D2D) Satellite Service
Services	Voice Data Video	Ultrabroadband connectivity Cloud / Edge Cloud Cybersecurity Virtual Reality / Augmented Reality IoT Smart infrastructures Customized sectoral applications
Investment Flows	Public Sector Telecom Operators	Telecom Operators Infra Wholesalers Cloud Providers Content and App Providers Infra Funds Satellite Providers Public Sector
Telco Strategies	Platform integration • Fixed • Cable • Mobile • Satellite Multi-play offers (bundles)	Asset-light strategies Infrastructure sharing Telecoms JV Partnerships / JV Infra Funds Partnerships across tech sector
Regulation	Telecom sector–specific focus	

2.

Technological Innovation
Transforming Connectivity

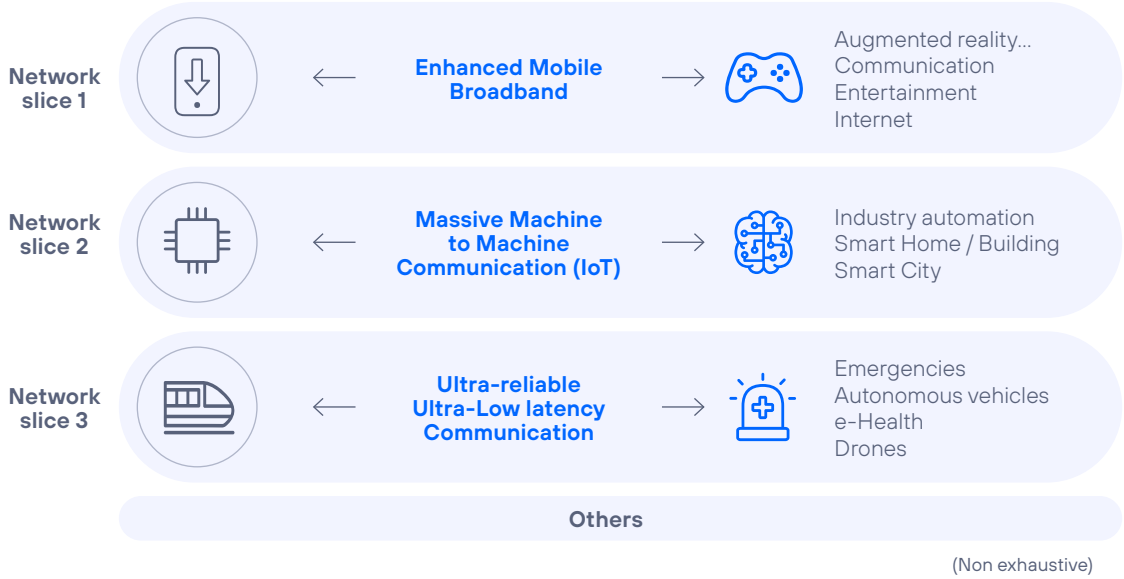
Connectivity is undergoing a silent revolution. What once was a space occupied by telecommunications operators has opened up to cloud providers, infrastructure companies and satellite operators. This transformation is driven by technological innovation and growing demand for digital services.

At the heart of this change are three technological pillars: next-generation networks, virtualisation and cloud-native infrastructures, and secure architectures ready for artificial intelligence (AI) and quantum computing. The accelerated pace of this technological convergence is testing the ability of regulatory frameworks to keep up and respond to new realities.

Next-generation Networks

Fibre optic and 5G networks are the backbone of connectivity. They offer greater speed, resilience and capacity to support AI-based services and other data-intensive applications. The deployment of 5G Standalone (5G SA) marks a key advance by offering ultra-low latency and network slicing, enabling the creation of private networks tailored to industry, transport or healthcare applications. The allocation of new spectrum bands further expands its capacity and allows networks to be adapted in real time to the demands of the industrial environment.

Figure 2. 5G Network Slicing: end-to-end virtual networks tailored to each application



(Non exhaustive)

Low Earth orbit (LEO) satellites also expand connectivity by offering high-speed connections to remote or underserved areas and in emergencies. Direct-to-Device (D2D) connectivity will enable the use of satellite services from mobile phones without the need for terrestrial infrastructure, a promising innovation that poses challenges in spectrum allocation.

From Hardware-defined Networks to Virtual and Cloud Connectivity

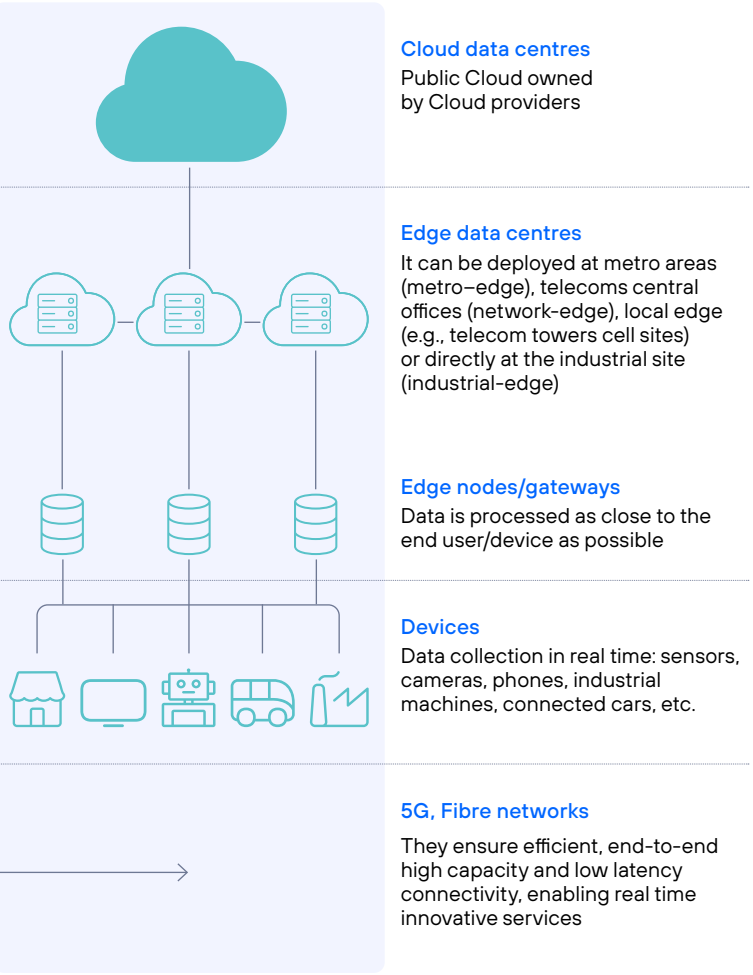
Telecommunications networks are migrating from physical hardware to virtualised and cloud-native architectures. Technologies such as network function virtualisation (NFV) and software-defined network (SDN) bring flexibility, scalability and efficiency, blurring the boundaries between networks and the cloud. This transition decouples telecommunications network functions from hardware and deploys them as cloud applications, reinforcing the interdependence between fixed, mobile and cloud infrastructures.

This change goes far beyond technology: it is redefining roles across the industry. Equipment manufacturers no longer just sell hardware but are evolving towards software solutions. At the same time, telecommunications operators are exploring new models such as Network-as-a-Service (NaaS), which allows network capabilities to be offered flexibly. With initiatives such as Open Gateway, operators are making their network functions available to businesses and developers through standardised APIs, enabling connectivity to be integrated directly into digital services.

Edge computing, which brings data processing closer to the end user, adds speed and performance and enables real-time applications in areas as important as logistics, healthcare and smart city management. Here, telecommunications play a decisive role in the deployment of the edge cloud.

Finally, open architecture (Open RAN) accelerates this evolution by separating hardware and software. Based on open standards and interoperability, it allows operators to combine solutions from different providers, reducing dependencies and fostering innovation.

Figure 3. **New "Telco-Edge-Cloud" paradigm: Technological convergence integrates cloud, edge, and fixed and mobile connectivity**



Cloud layer
Big Data processing
Data storage

Cloud data centres
Public Cloud owned by Cloud providers

Edge layer
Data processing
Virtualisation
Control response

Edge data centres
It can be deployed at metro areas (metro–edge), telecoms central offices (network-edge), local edge (e.g., telecom towers cell sites) or directly at the industrial site (industrial-edge)

Edge nodes/gateways
Data is processed as close to the end user/device as possible

Device layer
Sensors

Devices
Data collection in real time: sensors, cameras, phones, industrial machines, connected cars, etc.

Network layer
LAN (Fibre)
Wireless networks (5G)

5G, Fibre networks
They ensure efficient, end-to-end high capacity and low latency connectivity, enabling real time innovative services

Smart and Secure Networks: the Next Frontier in the Age of AI and Quantum Computing

Networks are becoming increasingly complex and interconnected, and artificial intelligence has become a key tool for managing them. Thanks to AI, telecommunications operators can anticipate and prevent failures, better manage traffic, and offer a more efficient and reliable service to users.

In this context, cybersecurity becomes a strategic issue. The new challenge is quantum security: quantum computing can jeopardise current encryption systems, but at the same time it enables new forms of protection. Thanks to their control over network infrastructures, operators are in a privileged position to lead the adoption of technologies such as quantum key distribution (QKD) or post-quantum cryptography.

Connectivity is no longer measured solely by speed or coverage. It is the foundation of a secure, competitive and resilient digital future. And it is telecommunications operators who are strengthening it by promoting and adopting new technologies.

3.

New Players and Market Dynamics

Technological advances have profoundly reshaped the connectivity market, giving rise to new players and business models that compete directly with traditional operators.

Today, connectivity includes multiple network infrastructure providers, from conventional mobile and fixed operators to low-orbit satellite providers and infrastructure wholesalers (InfraCos, FibreCos or TowerCos), which operate at different levels of the network.

In parallel, large technology companies have entered areas previously reserved for telecommunications, such as submarine cables and satellite services. At the same time, content and application providers (CAPs), with global scale and significant market position, are expanding into services traditionally provided by operators, such as voice or messaging, under regulatory frameworks that are often more lax or asymmetrical in relation to telecommunications.

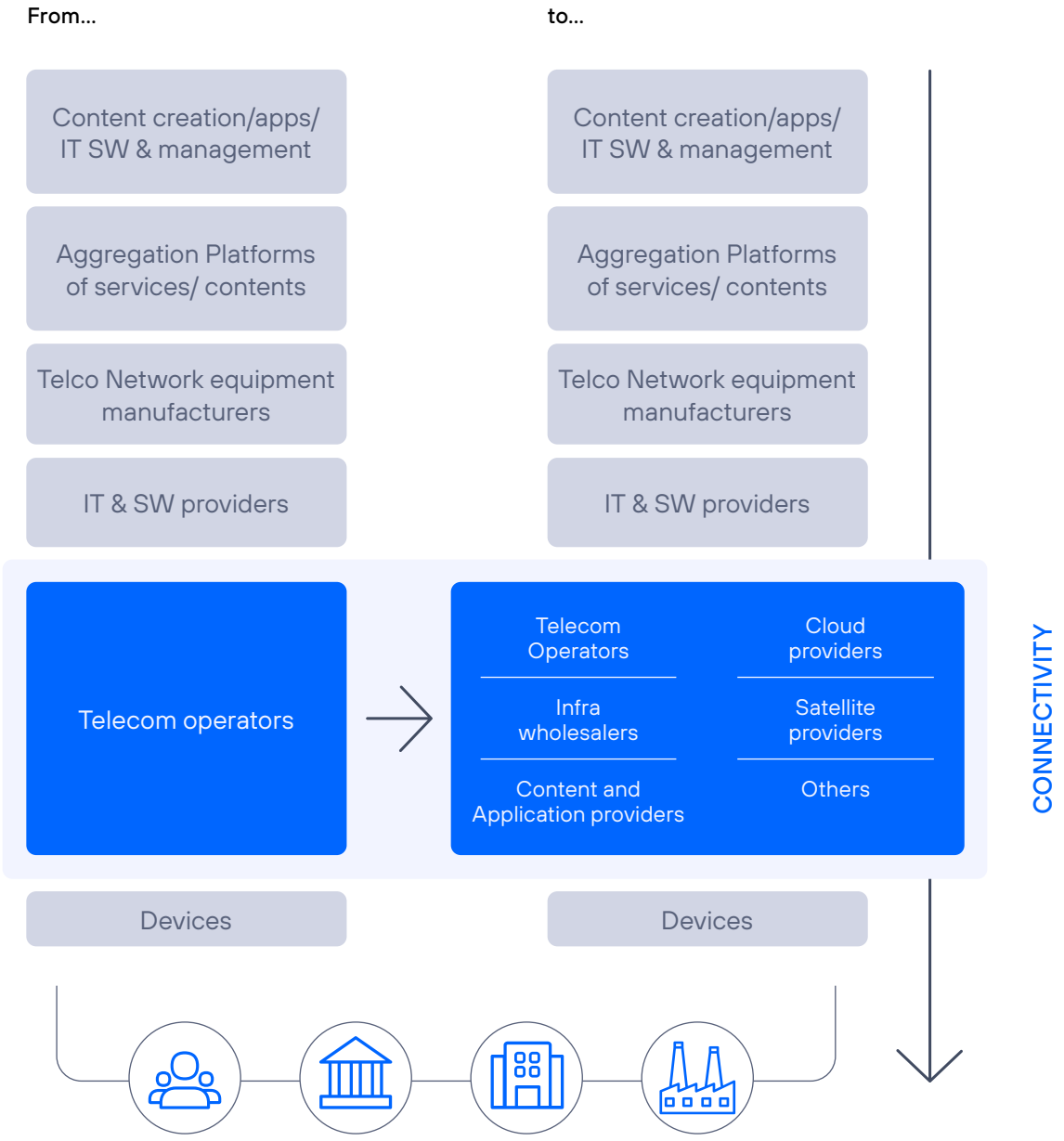
The transition to the cloud has reinforced the role of large global cloud service providers (hyperscalers), which account for 70% of the European market, compared to a mere 2% for the largest European player[1]. These providers not only manage data centres interconnected by private networks and submarine cables in competition with international telecommunications networks but are also key to the virtualisation and migration of the networks themselves. In this new paradigm, cloud infrastructures and telecommunications networks are intertwined, but the balance of market power is not always equal.

At the same time, satellite providers are gaining prominence with innovations such as Direct-to-Device (D2D) access, which allows conventional mobile phones to connect to satellites without specific equipment. This connectivity complements or even competes with terrestrial networks, ensuring outdoor coverage, service in maritime or aeronautical environments, and in emergency or disaster situations.

However, the D2D model still faces technical challenges. Its quality of service is inferior to conventional mobile networks, especially in broadband, and it can cause interference. It also raises dilemmas about the efficient use of spectrum, which could be better allocated to international mobile communications (IMT). These factors require rethinking of spectrum management, interconnection and coexistence with mobile networks.

In short, connectivity has become more complex and competitive. The emergence of new players is changing the value chain, with a strong concentration of power in the hands of non-European giants. This imbalance underlines the urgency of strengthening the role of Europe and its operators to ensure strategic autonomy, in-house innovation and a sustainable digital future.

Figure 4. The "deconstruction" of the traditional telecom sector value chain



4.

Investment and Alliances in the Telecommunications Sector

The evolution of connectivity is transforming markets, strategies and investment flows, generating new services and collaboration models.

New Strategies

The ecosystem has become more complex and diverse, and operators are adapting their strategies to remain competitive and sustainable, while continuing to invest and innovate in connectivity, technology and services that meet the highest global standards for end users.

Operators are therefore exploring new business models. One of these, is the shift from capital expenditure (CapEx)-based models to more flexible operating expenditure (OpEx)-focused models. This also reflects how the market values the different players: wholesale infrastructure companies tend to be valued higher than traditional operators[2]. With stable long-term revenues from anchor customers, mainly operators, and lower investment requirements, these models are perceived as low-risk and profitable investments, especially given the growing demand for connectivity and the rollout of 5G and fibre networks.

In this context, some operators are divesting network assets such as mobile towers, fibre networks, submarine cables and data centres to free up capital, reduce debt and gain strategic agility. In some cases, operations have been split into two entities: one for infrastructure (NetCo) and another for services (ServCo).

Another key strategy is partnerships with public and private investment funds for the deployment of high-capacity networks, accelerating coverage in medium-sized cities and rural areas. Examples of this strategy are the FiberCos promoted by Telefónica in Brazil (with CDPQ), Chile (with KKR), Germany (with Allianz) and Spain (Bluevía with Vauban and Crédit Agricole).

In addition, alliances are being formed with satellite providers to deploy Direct-to-Device (D2D) services, integrating terrestrial and non-terrestrial networks.

At the same time, collaboration between different players is becoming closer. Partnerships between operators and large technology companies, such as Telefónica Tech with Microsoft,

Amazon Web Services and Google Cloud, enable the provision of hybrid cloud solutions[3], and Infrastructure as a Service (IaaS). These collaborations leverage fibre networks to improve the speed and performance of cloud services. At the same time, operators are also jointly developing new technological solutions, such as Internet of Things (IoT) management platforms, which require fibre networks for efficient and scalable connectivity. Telefónica Tech's Kite platform is an example of this[4].

New Investment Flows and New Models of Cooperation

Another key dimension of this new era of connectivity is the diversification of investment flows. According to the OECD[5], both content and application providers (CAPs) and investment funds are investing in different levels of connectivity infrastructure.

Investment funds, attracted by the stable, long-term returns of infrastructure assets, are investing in tower, antenna, data centre and wholesale fibre network companies, thereby expanding the ecosystem.

For their part, large CAPs are expanding their investment beyond data centres and content delivery networks (CDNs) to private networks, submarine cables and direct interconnections between their data centres.

CDNs are designed to deliver content more quickly by placing it closer to users, often by deploying servers directly on telecommunications operators' access networks. By also investing in transport networks, large CAPs can manage their data globally with greater control and lower costs. This reduces their dependence on international backbone networks, i.e. transport networks traditionally operated by telecommunications, and decreases the need for traditional transit services and associated costs. This transformation reflects a profound change in Internet architecture and associated business models. Today, five large platforms account for more than 50% of traffic on fixed and mobile networks[6], creating an imbalance of bargaining and market power vis-à-vis operators.

However, investments by CAPs and other players do not replace the need to continue strengthening backbone, aggregation, or access networks, where operators continue to play a central role. According to Connect Europe's State of Digital Communications 2025 report[7], operators contributed 60% of investment in the digital communications market, compared to 30% from CAPs and around 10% from equipment manufacturers.

The telecommunications sector remains a key driver of investment in high-capacity networks that integrate terrestrial, satellite and cloud infrastructures. These networks are essential for scaling transformative technologies such as 5G, artificial intelligence and the Internet of Things, and are key to ensuring Europe's future and strategic autonomy.

5.

Regulation Shift: Balance and Scale

Current regulatory frameworks do not reflect the new reality of connectivity, leading to an imbalance that benefits some players while others face barriers to investment and innovation The evolution of connectivity requires updating a regulatory framework that was designed for an era when competition was local and value was focused on traditional telecommunications infrastructure.

Today, connectivity includes local and global players with significant differences in bargaining power and an accelerated pace of technology transformation. Applying rules from the past slows innovation and investment and widens existing asymmetries.

The current framework is fragmented and sector-specific, perpetuating imbalances and hindering fair competition. Modernising it to recognise the convergence of fixed, mobile, satellite and cloud networks is key to creating a competitive, resilient and balanced ecosystem where all players can grow, invest and innovate on equal terms.

Balancing the Relationships between Operators and Big Tech Companies

The convergence of fixed, mobile, satellite and cloud connectivity is redefining competition. Traditional operators face new global players with fewer obligations, creating imbalances in relations between different companies and distortions in the market.

From a regulatory perspective, risks arise such as market power concentration, regulatory imbalances, and forms of unfair competition that limit the ability to innovate on a level playing field. Added to this are potential losses of strategic autonomy and digital sovereignty and the coexistence of divergent standards in sensitive areas such as cybersecurity or data protection.

Figura 5. **Regulatory asymmetries in connectivity**

	Telecommunications Operators	Big Techs	Regulatory Asymmetry
Service Regulation	High regulation (licences, authorisations, numbering obligations, wholesale access, emergency services, interconnection, roaming, price control, regulation of specific end-user rights, universal service obligations, etc.) and a strong penalty regime with heavy fines for infringements.	They operate "over-the-top" (OTT) with limited regulation (DSA, DMA).	Telecommunications operators are subject to strict compliance; big tech faces minimum service obligations. Service regulation applies to all telecommunications operators, while DMA applies to designated gatekeepers and specific key platform services.
Taxation and Tax Contribution	Payment of corporate tax, spectrum usage fees, universal service fund, investment in rural access, telecommunications taxes, numbering taxes, etc.	They often transfer profits globally; minimum corporate tax.	Telecommunications operators bear a higher tax burden in each country.
Digital Neutrality	Obstacles to the management of services by telecommunications operators.	Free to use their assets.	Potential efficiency of use and return on investment much lower for telecoms.
ePrivacy, Security	Must comply with strict sector-specific regulations on privacy, surveillance and lawful interception.	Strong encryption, limited government access.	Uneven standards of compliance and enforcement. Easier for Big Tech to deploy innovative data services. Although Big Tech often avoids strict compliance with local regulations, they are still subject to their own national laws, such as the US CLOUD Act, which can potentially affect information security. Operators must comply with strict sector-specific privacy regulations in addition to the GDPR, while Big Techs are only subject to the GDPR.
Asymmetries in Global Operations	Subject to national and local regulations, national laws and EU jurisdiction.	Operate globally, often outside local jurisdiction.	Global scale gives them agility and regulatory arbitrage that telecom operators lack.

Some elements require special attention. The interconnection model designed for telecommunications operators has been profoundly altered by the emergence of large technology companies and cloud service providers operating with massive volumes of traffic and private connectivity networks. The peering model, based on "interconnection between equals", has given way to a very different market with clear imbalances in bargaining power.

Similarly, regulations such as Open Internet respond to a market reality that bears little resemblance to the current one, where networks, the cloud and CDNs converge. Once again, applying these rules today does not promote an Open Internet, but rather reinforces the imbalance between the different connectivity players.

Furthermore, current spectrum policy disproportionately burdens mobile networks compared to other technologies (WiFi, private networks or satellites), even in similar bands. This limits the efficiency of critical infrastructure deployment.

Priority policy actions:

- **Regulation adapted to technological convergence:** ensure that any new regulation, such as the European Digital Networks Act (DNA), addresses connectivity from a convergent perspective, resulting from a sustained process of technological convergence.
- **Uniform and horizontal regulation:** promote horizontal regulatory frameworks that apply identically to all segments of the connectivity value chain and address issues such as privacy, consumer rights and security, while removing sector-specific obligations for telecommunications.
- **Spectrum policy that promotes investment:** move towards a spectrum policy that is more favourable to investment, with equitable conditions between connectivity technologies (mobile, Wi-Fi, private networks or satellites) and in which similar rates are applied for equivalent spectrum bands.
- **Service-based regulatory fairness:** apply principles of regulatory fairness based on the nature of the services offered, rather than on the inherited identity of the provider.
- **Mandatory dispute resolution mechanism:** establish a mandatory dispute resolution mechanism to enable fair commercial agreements between operators and large application and content providers (CAPs) or cloud service providers.
- **Sustainability commitments throughout the chain:** promote commitments to sustainability and responsible traffic management throughout the value chain.

The Urgency of Achieving Scale

The connectivity market is showing a growing imbalance, driven by differences in scale between its main players. Telecommunications operators, who bear the investment in network deployment and modernisation, are seeing their revenue growth remain low or stagnant.

Meanwhile, content, application and cloud service providers, which depend on the quality and availability of these networks, have experienced exponential growth and now account for most of the value generated in the ecosystem[8]. This underscores the need to strengthen the scale and investment capacity of operators to ensure a fairer, more competitive and sustainable ecosystem.

This growing disparity reflects an unsustainable dynamic. Telecommunications operators are suffering from diminishing returns and finding it increasingly difficult to gain scale. This limits their ability to invest in infrastructure and technologies, jeopardising not only the EU's digital objectives but also its strategic digital autonomy.

The regulatory and competition framework continues to focus on reducing prices for end users. This approach has led to artificial competition and market fragmentation through structural remedies in concentration processes, as seen in the Orange-MásMóvil merger in Spain (2024) or the O2 and E-Plus merger in Germany (2015), weakening the sustainability of the sector.

Furthermore, current merger control rules do not capture many relevant transactions in the digital economy, as they are based almost exclusively on turnover or transaction value. While telecommunications operators face intense scrutiny when attempting to gain scale through mergers, large digital platforms acquire start-ups or technology assets with little scrutiny, without adequately assessing their strategic impact on European industry.

In this context, Mario Draghi's report warns that the sector's profitability must be strengthened and that it is time to allow operators to scale up. Only in this way can competitiveness be improved and robust and sustainable European connectivity be ensured, strengthening European strategic autonomy[9].

Priority policy actions:

- **Update EU competition policy:** adapt it to a global market dominated by players with much greater scale and financial capacity, promoting sustainable markets and stimulating investment.
- **Adapt regulatory remedies:** promote remedies in line with the new era of connectivity, moving beyond an approach focused exclusively on retail prices and the number of competitors, and guiding merger decisions towards greater efficiency in terms of consumer welfare and boosting incremental investment. Avoid imposing structural remedies that artificially favour the entry of new players on privileged terms.
- **Incorporate industrial and strategic vision into merger control:** update the merger control framework with a long-term vision that incorporates industrial and strategic considerations. Broaden the concept of consumer welfare and business competitiveness to include the impact of investment in the development of advanced services.
- **Review merger control thresholds:** adapt them to the new realities of the globalised digital market, where turnover or price are not representative metrics. An alternative threshold could be the value of the transaction, especially in digital markets.

Ultimately, Europe's digital future depends on a strong telecommunications sector. To achieve this, bold reforms are needed that:

- Balance relationships between players in the digital ecosystem;
- Enable telecommunications operators to scale, invest and innovate;
- Ensure that investment in infrastructure is viable, equitable and future-proof.

Europe cannot build its digital autonomy without a strong and sustainable strategic sector such as telecommunications.

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