Playbook

Digital Public Policy

2026

Telefónica

For years, Telefónica has played an active role in shaping public policies that lay the foundations for a competitive, innovative digital era guided by societal well-being.

This Playbook marks another step forward. We are introducing a novel and fresh approach to the debates that will define the digital future, while making the world of public policy more accessible, and engaging.

Pablo de Carvajal, General Counsel & Regulatory Affairs, Telefónica S.A.

Public policies play a pivotal role in shaping a digital future that drives growth and welfare. As connectivity and transformative technologies become central to social progress, it becomes essential to design policies that leverage their full potential and ensure the benefits of the digital era are broadly shared.

As a key player in the telecommunications sector, providing connectivity and technological solutions, Telefónica aims to contribute its expertise and knowledge to the design of effective digital public policies.

We present this Playbook as a practical and comprehensive guide to our vision for digital and technology-driven public debate. It offers policy recommendations designed to foster competitiveness, technological progress, sustainability, and inclusion. We hope this document serves as a valuable resource for all those engaged in public policymaking, contributing to the shared effort of building a better future for all.

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Competitiveness

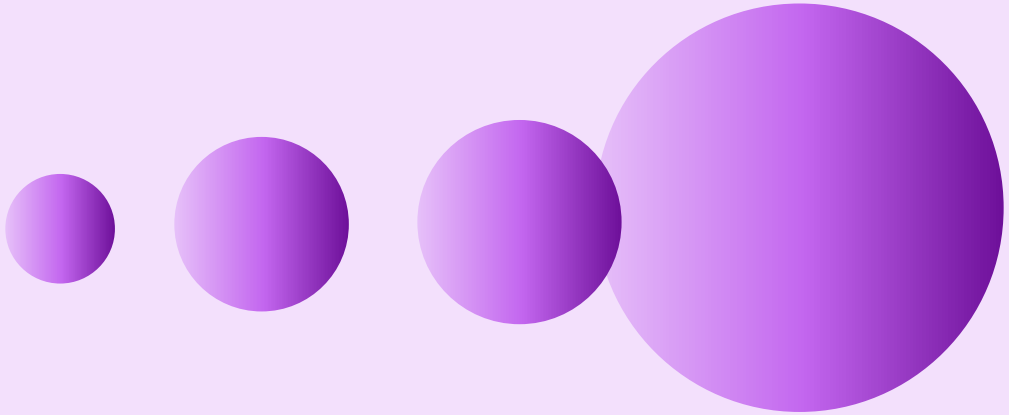
Technological innovation

Sustainability and inclusion

Competitiveness

Strengthening the European Union's competitiveness requires fostering innovation and building a dynamic business ecosystem capable of leading global markets while delivering social welfare through better services.

In this context, a competitive telecommunications sector is essential. Its investments underpin the deployment of high-capacity digital infrastructures and the development of advanced technological solutions, driving long-term economic growth and enhancing citizens' well-being.

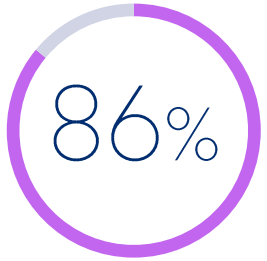


01

A Pro-Investment Regulatory Framework

Context

A simpler, more agile and predictable regulatory environment: An EU priority to boost competitiveness

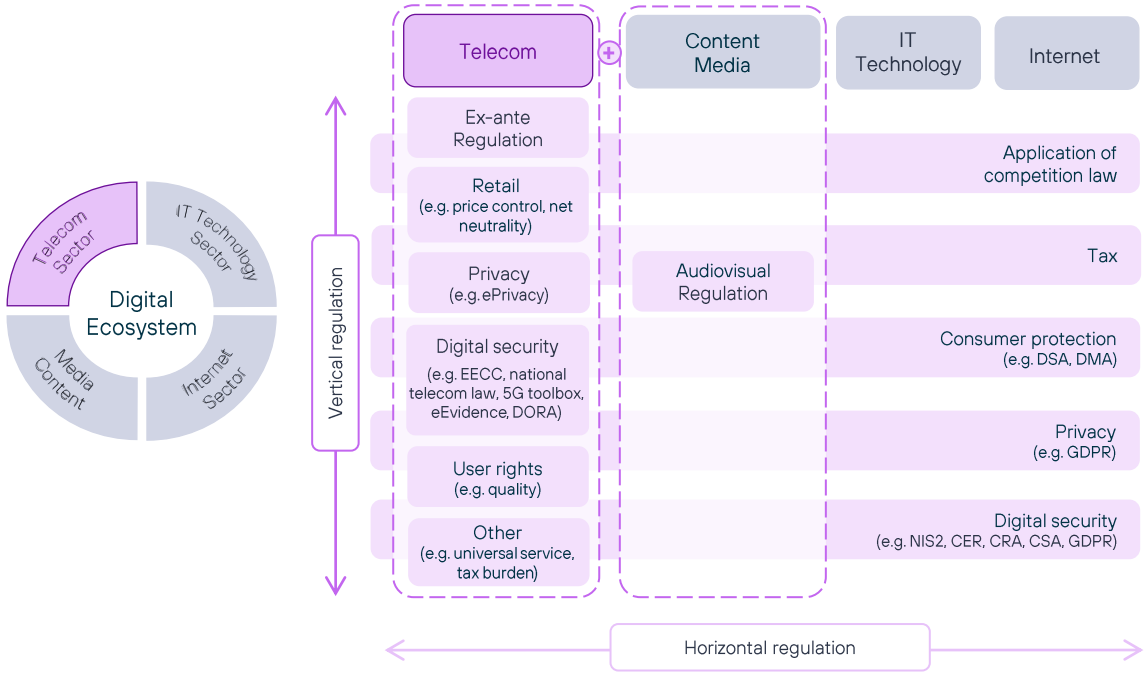


Percentage of companies in Europe that believe regulation limits their competitiveness[1].

+5 Billion euros by 2029

The annual saving estimated by the European Commission if administrative costs were reduced [2].

The EU Digital Networks Act[3] should offer an opportunity to simplify the regulatory framework for the telecom sector and reduce asymmetries within the digital ecosystem



Challenges

EU Digital Networks Act: The challenge of promoting investment-friendly regulation that boosts technological innovation

Obsolete and complex regulation

Obsolete, redundant and rigid regulations that are not adapted to market realities hinder innovation and market efficiency.

Overregulation of the telecommunications sector and asymmetries in the digital ecosystem

Unnecessary ex ante obligations for competitive telecommunications markets.

Asymmetries between traditional operators and large digital providers.

Lack of incentives for investment and innovation

Insufficient incentives for investment in spectrum and efficient network deployment.

Lack of regulatory certainty for the development of innovative services such as 5G network slicing.

Fragmentation of user protection and security regulations

Prescriptive sectoral rules, obsolete controls and absence of a coherent privacy and security framework.

Move forward, through the EU Digital Networks Act (DNA) and regulatory simplification (Omnibus), towards a modern and investment-friendly European telecommunications regulatory framework that simplifies obligations, promotes competition, ensures a level playing field between players and encourages innovation, while protecting users and security

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1 Promote ex ante deregulation of markets

Let markets be governed by competition law and the Gigabit Infrastructure Act (GIA). Only maintain specific ex ante obligations where there is no effective competition due to the lack of active wholesale access that would enable competition in the retail market.

Reject the creation of a harmonised pan-European wholesale access product, considering it unnecessary.

2 Transition to an investment-friendly spectrum policy

Ensure predictable and balanced spectrum policies that encourage investment, with consistent allocation procedures following best practices, undefine or automatically renewable licences, and auctions that prioritise spectrum efficiency over revenue maximisation.

3 Promoting a level playing field in the digital ecosystem

Include large content providers and hyperscalers in the Digital Networks Law, with binding reciprocal obligations to negotiate the conditions for IP traffic transport, including a dispute resolution mechanism.

Update the provisions of the Open Internet Regulation (OIR) by implementing a principles-based traffic management policy that enables the efficient development of specialized services over 5G slicing.

4 Promote horizontal frameworks and further regulatory simplification

Promote deeper regulatory simplification in areas such as roaming, call termination, and cybersecurity, beyond the 50% reduction in reporting obligations across all regulatory domains.

Move toward horizontal regulations and eliminate outdated rules, such as the ePrivacy Directive.

Shift from prescriptive sector-specific rules to a principles-based approach aligned with horizontal consumer protection laws.

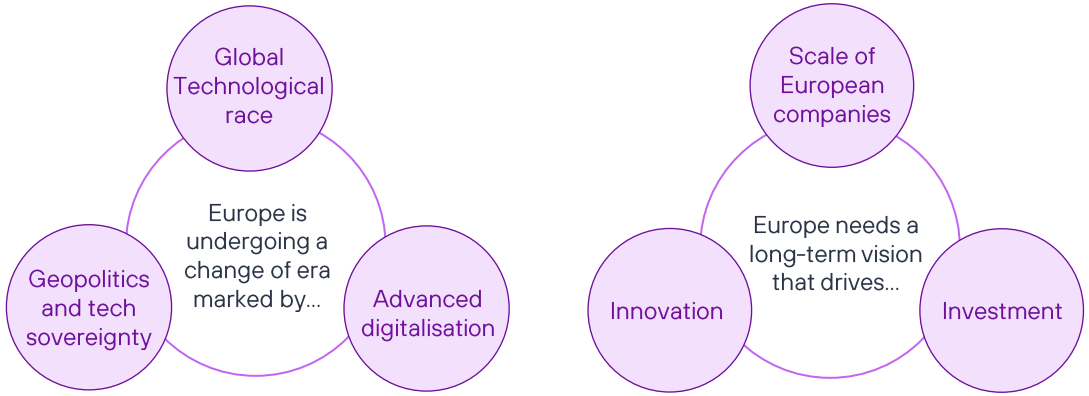
5 Evolve universal service obligations

Replace obsolete obligations with direct aid to vulnerable users, ensuring affordability without unnecessary burdens on operators.

02

Consolidation and Scale

Europe needs reforms to facilitate the scaling up of players in strategic sectors to ensure their competitiveness



The European telecommunications market, which is key to technological progress, remains artificially fragmented. Telecoms companies lack sufficient scale in their relevant markets and face limited capacity to invest efficiently and in strategic technologies.

	United States	Europe	China
Domestic mobile network operators (MNOs) representing >97% of mobile revenues	3 operators	38 operators	3 operators
Availability 5G standalone (2025)[1]	24%	2%	77%

Toward a change in regulatory approach: From static efficiency (prices) to dynamic efficiency (investment and innovation)

Fragmentation limits profitable scale, hampering investment capacity and technological progress

In the current context of flat rates, telecommunications operators require a minimum percentage of customers in the geographical areas where they deploy their networks to achieve a profitable scale and be viable. This is called take-up, and it is the factor of production in the sector.

The lack of profitable scale among European operators, due to insufficient take-up, hinders the deployment, adoption, and investment in new technologies, limiting the opportunity to boost consumer welfare, business growth, and the EU's strategic autonomy.

The focus on static efficiency encourages the artificial entry of operators, and the merger control framework limits the exit of less efficient operators, creating a market structure that is unsustainable for innovation and investment.

By prioritising static efficiency and linking welfare to price reductions, regulation has favoured the entry of new operators on advantageous terms. This has led to high fragmentation, with numerous operators, some of which are unviable because they cannot achieve a take-up that allows them to be profitable, that is the percentage of customers necessary to operate and invest.

With the same objective of increasing static efficiency, competition policy has limited the exit of less efficient operators through consolidation processes. In addition, the imposition of structural remedies has created market structures that hinder investment.

Facilitate a natural reorganisation of the sector, reducing fragmentation, eliminating regulatory advantages for new entrants and promoting consolidation geared towards investment and innovation, in line with the European Union's competitiveness and welfare objectives

1 Promote a market structure that encourages operators to compete on value, beyond prices

Promote public policies geared towards dynamic market efficiency, understood as the ability of markets to generate innovation, attract investment, and adapt to technological transformations. This implies:

- Reorienting administrative, regulatory and competition decisions towards a dynamic market efficiency approach, analysing the supply side of companies. In the case of network operators, it should be considered their need to achieve profitable scale in network deployment areas to promote their investment and innovation capacity.

2 Promote a regulatory framework that enables operators to achieve the scale required for their viability and competitiveness

Allow fragmentation to be reduced through consolidation in the telecommunications markets to benefit consumers, businesses and the economy as a whole, as it would generate effective competition and continuous investment in digital infrastructure, driving more differentiated, fit for purpose and competitive services.

Eliminate regulatory mechanisms that promote artificial competition by stopping the granting of asymmetric regulatory advantages to new entrants based on a static conception of competition that focuses solely on prices. Prioritise the natural functioning of the market instead.

Facilitate consolidation processes among operators so that they can increase their take-up, allowing orderly exits without imposing remedies that generate artificial competition in already highly competitive markets with advantages for third parties. If necessary, impose measures that encourage investment and innovation rather than structural remedies that merely lead to the emergence of a privileged player.

Allow for market-led reorganisation of the sector and adopt a more flexible and reliable approach to horizontal agreements in favour of innovation.

3 Update competition policy

Update competition policy to consider the effects of transactions on parameters relevant to social welfare beyond price, such as innovation, quality, speed of deployment, value-added services, resilience, environmental or sector sustainability, and long-term investment cycles rather than short-term prices and expected market shares at the country level.

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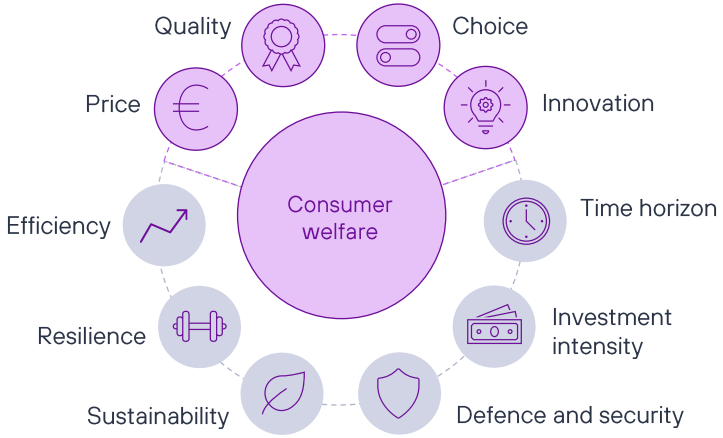
Review of Merger Control Policy

A competition policy for sustained well-being over time

Competition policy should be conceived as a guarantee for companies to invest, innovate and, in doing so, promote social welfare.

To this end, it is essential to understand consumer welfare from a comprehensive and holistic perspective, beyond prices alone.



In line with this vision, the European Commission has set the redefinition of the current competition framework as an objective of its institutional cycle

Both the mission letter to Vice-President Teresa Ribera and the EU Competitiveness Compass recognise the need to review competition policy in order to align it with the objectives of industrial policy and the needs of the European economy[1].

> *[...] give appropriate weight to the most pressing needs of the European economy in terms of resilience, efficiency and innovation, the time horizons and intensity of competition investment in certain strategic sectors [...]*

Evolution towards a comprehensive approach aimed at promoting long-term well-being and competitiveness

Application of a static, short-term approach in the EU Merger Guidelines

Parameters relevant to consumer welfare, such as innovation, quality, or choice (including broader objectives such as resilience or sustainability), which can generate greater benefits for consumers in the long term, are not sufficiently analysed.

Need for a more up-to-date economic theory, geared towards dynamic market efficiency, which takes into account the production function of each sector.

Risk of the European Merger Regulation becoming outdated

Absence of a review of the thresholds for approving acquisitions in order to capture the effect of innovative companies with high growth potential.

Possible inconsistencies between regulations such as the DMA and the FSR.

Limited involvement of other Commission Directorates-General.

Merger control should adopt the economic approach of dynamic efficiency, analyse all the multiple dimensions of consumer welfare, and assess long-term economic efficiencies and benefits beyond the relevant markets in order to act as a true guarantor of innovation and growth in Europe

1 Review the EU Horizontal Merger Guidelines

Assess the conditions of competition before and after the merger in terms of prices, but also in terms of quality, innovation and variety of choice. This would involve conducting a comprehensive analysis of the supply side of companies and sectors, i.e. an analysis of their production structure and their ability to compete before and after the merger.

Integrate a broader and more balanced assessment of efficiencies, tailored to sectoral characteristics and investment and innovation cycles, taking into account all dimensions of consumer welfare, including dynamic effects linked to innovation, resilience and sustainability.

Consider investment-oriented remedies where there are concerns about the incentives of the parties post-merger, thereby preserving the capacity, scale and incentives to compete for the benefit of consumer welfare.

2 Review the EU Merger Regulation

Consolidate the reform of the Guidelines and...

Review turnover thresholds: update the amounts and include a new transaction value threshold.

Establish a local nexus test in all notifiable transactions.

Align the EU Merger Regulation with the Digital Markets Act and the Foreign Subsidies Regulation for greater consistency in thresholds and notification requirements.

Simplify procedures to focus on complex cases.

Adopt a more balanced and transparent approach to the merger control procedure. Separate the team responsible for investigating the case from the decision-making body, as is done in many jurisdictions. Encourage greater involvement from other Directorates-General of the European Commission.

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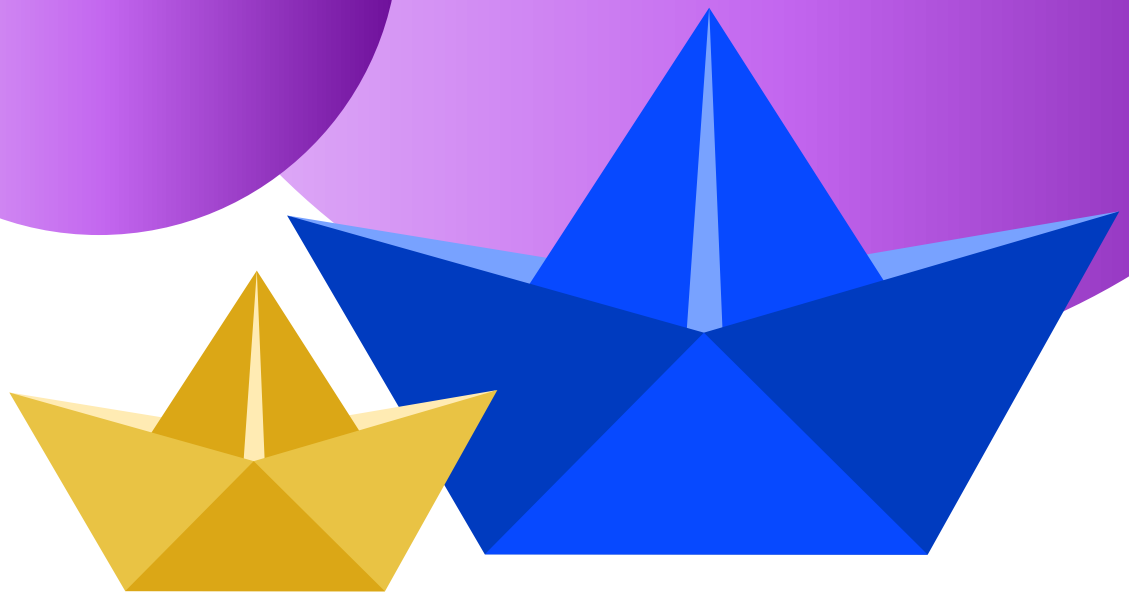


Strategic Autonomy and Digital Sovereignty

Context

Europe 2030: A more competitive, autonomous and resilient EU, powered by innovation, investment and social welfare

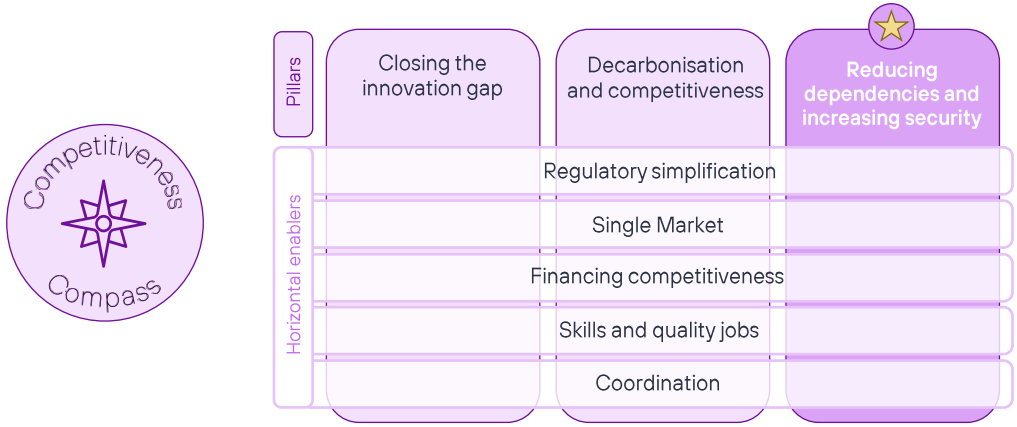
From the diagnosis...

Europe is losing competitiveness and autonomy due to low productivity growth (~1%)[1] caused by a lack of investment and innovation.

E. Letta[2] and M. Draghi[3] make an urgent call for Europe to implement reforms that boost competitiveness and the integration of the Single Market.

To action...

The European cycle (2024-2029) begins by transforming the recommendations of the Letta and Draghi reports into a new strategic framework: the Competitiveness Compass[4].



The next technological era, driven by high-capacity networks and transformative technologies such as AI, is an opportunity to strengthen economic integration, competitiveness, strategic autonomy and European digital sovereignty.

Challenges

Need for momentum and ambition in the European institutional response

Lack of European digital companies with competitive scale to drive investment and innovation and accelerate the reduction of strategic dependencies

High fragmentation limits the scale of operators, reducing investment in the development of emerging technologies and advanced digital services.

80% ... of digital technologies in Europe are imported[5].

90% ... of European data is managed by non-European digital companies[6].

Need to boost the competitiveness and sovereignty of digital infrastructures

Per capita investment in telecommunications in Europe is almost half that of the United States and is below that of other regions[7].

70% ... of the European *cloud* market is managed by three US operators (the largest European provider does not reach 2%)[8].

Risk of widening the innovation gap and therefore dependencies

The annual investment in AI by the four leading US technology companies (~€200 billion in 2024) exceeds the EU's total annual budget (€170 billion)[9].

700,000 billion euros ... is the annual investment gap between the EU and the US in technology and innovation[10].

Need to consolidate an environment that enables European companies to grow in Europe

The complex and fragmented regulatory environment limits market integration and the growth and innovation capacity of European and digital companies.

Risk of reduced competitiveness and greater dependence on more agile markets conducive to growth and innovation.

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Promote an environment that enables European companies to grow, innovate and compete to achieve Europe's strategic objectives of digital autonomy and sovereignty

1 Promote a regulatory environment conducive to investment and innovation

Update competition policy and merger regulations to facilitate business scalability.

Deepen the Single Market by removing legal, administrative and political barriers to the free movement of resources, simplifying regulation and promoting technological convergence through frameworks adapted to market realities.

Promote public-private dialogue to drive a regulatory framework that encourages investment and innovation.

2 Boost the competitiveness and sovereignty of digital infrastructures

Enable telecommunications operators to achieve profitable scale in their network deployment areas by facilitating intra-market consolidation.

Promote an investment-friendly spectrum policy, increasing supply and certainty about future availability, which is key to innovation, and ensuring fair allocation that maximises value for users.

Update the provisions of the Open Internet Regulation (OIR) by implementing a principles-based traffic management policy that enables the efficient development of specialized services over 5G slicing.

Strengthen Europe's strategic commitment to a sovereign cloud by implementing a public procurement policy for sovereign cloud services for public administrations, together with promoting an open-source cloud model.

Promote horizontal frameworks for issues such as privacy, consumer rights and security, removing sector-specific telecommunications regulation.

3 Promote innovation made in Europe and facilitate the transition of R&D to the market

Promote an innovative and balanced digital ecosystem through standards and practices that ensure transparency, neutrality, fair competition and international cooperation.

Commit to the development of transformative technologies, technological entrepreneurship and the attraction and retention of talent, expertise and know-how through tax incentives, support programmes, funds and frameworks that encourage investment and public-private and cross-sector collaboration.

4 Strengthen digital sovereignty for a stronger and more relevant EU on the global stage

Adapt and align the approach to competition policy, State aid and regulatory frameworks with the objectives of the European industrial strategy.

Encourage policies that stimulate demand, promoting the adoption of emerging and cross-cutting networks, services and technologies, digital trust and digital skills to increase productivity, employability, industrial differentiation and use.

Strengthen international cooperation for convergence in the development of based on harmonised principles for technologies such as cybersecurity and AI.

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Digital Single Market as a Strategic Lever of Competitiveness

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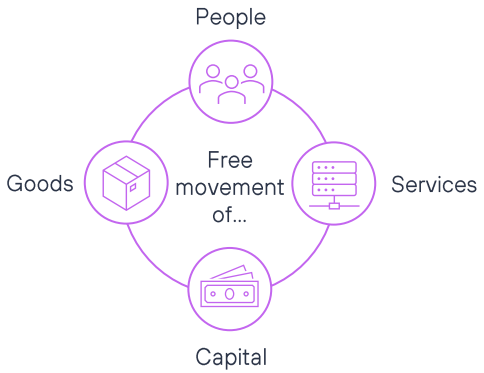
Context

Fully integrating the Single Market is a key priority of the European Commission's work programme[1]



- 450 million people and 26 million businesses.
- The world's second largest economy with a GDP of €18 trillion.
- The Single Market has increased the EU's GDP by 3–4% and created 3.6 million jobs.

Completing the Single Market could double these benefits

To move towards a Digital Single Market, it is essential that European citizens and businesses benefit from high-quality, resilient connectivity that...

Offers opportunities to innovate, develop technologies and reap the benefits of advanced digital services.

Enables digital services to grow and deploy on a European scale, driving the spread of technological innovation.

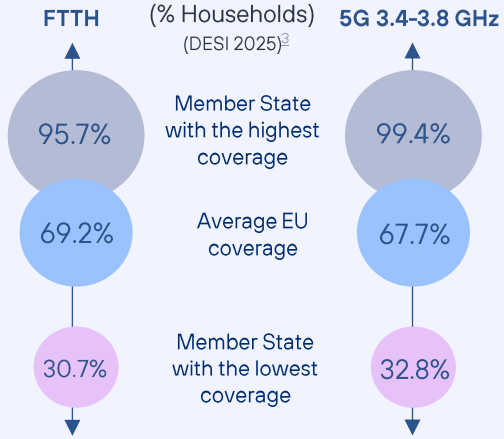
Facilitates the digital expansion of other companies' services, including digital providers, into other Member States, thereby expanding their market.

Challenges

Fragmentation and regulatory inconsistencies that hinder integration

Disparity in the degree of deployment and quality of European networks

High fragmentation in telecommunications markets hinders the profitability of investments, leading to different levels of progress towards European connectivity targets[2].



Suboptimal regulatory environment

Inconsistent application of EU directives leads to fragmentation, higher compliance costs and competitive imbalances. This, together with a complex regulatory mosaic, limits free movement.

A heterogeneous and suboptimal spectrum licensing framework, with differences in conditions and processes, creates uncertainty and risks uneven adoption of best practices and investment momentum.

Gap between technological convergence and regulatory adaptation

The convergence between terrestrial networks and the cloud, driven by virtualisation, "softwarisation" and AI, exceeds the responsiveness of regulatory frameworks, jeopardising balanced competition and investment in digital infrastructure.

Move towards a true European Digital Single Market that strengthens the scale of the sector, reduces regulatory pressure and ensures a level playing field in a converging digital ecosystem to boost investment and the roll-out of next-generation networks

1 Boost the scale of operators through an investment-friendly competition policy

Facilitate intra-market consolidation to enable operators to compete and acquire the profitable scale necessary for their viability and growth, strengthening their investment capacity, as an essential step towards eventual cross-border consolidation.

Ensure that competition decisions do not create exit barriers for market players caused by the imposition of remedies that create artificial competition and unsustainable market structures.

Reorient competition policy from a price-focused approach to one that encourages sustainable investment.

2 Prioritise regulatory simplification over mere harmonisation for a more integrated and competitive Single Market

Ensure a simplified regulatory framework that eliminates "gold plating" as well as cost orientation requirements, improving efficiency and interoperability in order to move toward an integrated European market.

Ensure consistent interpretation and application of EU legislation supported by simplified best practice guidelines.

Analyse and simplify the interaction of existing regulations, eliminating redundant rules and reducing intervention.

Ensure predictable and balanced spectrum policies that encourage investment, with consistent allocation procedures following best practices, licence renewal, indefinite terms and minimal costs, prioritising network deployment over tax revenue.

3 Unlock the potential of technological convergence by facilitating digital services at European scale

Update European telecoms regulation to align it with new technological realities and European industrial policy objectives, ensuring that it supports rather than hinders the integration of *edge-cloud* services, AI-driven and quantum-safe networks, and next-generation connectivity solutions (e.g. 5G Network Slicing).

Do not hinder investment in networks based on open architectures (APIs) and the cloud to ensure that European networks are future-proof and enable greater innovation in digital services.

Leverage public procurement and financing as a strategic tool to drive European innovation and resilience.

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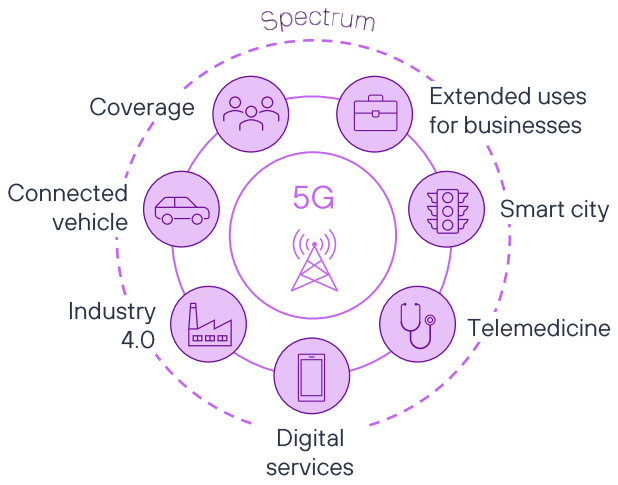
06

Spectrum to Build European Technological Capacity

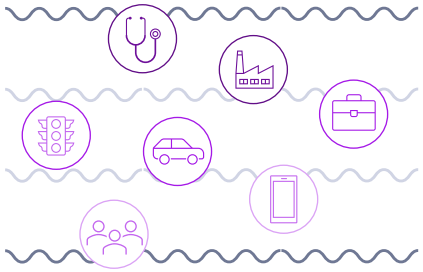
The basis for technological capacity

Building future-proof technological capacity that enables an advanced digital economy requires a high-quality mobile network: low latency, high speed, ubiquity and resilience.

The availability of spectrum under reasonable conditions is essential for the efficient deployment of the mobile networks that society demands.

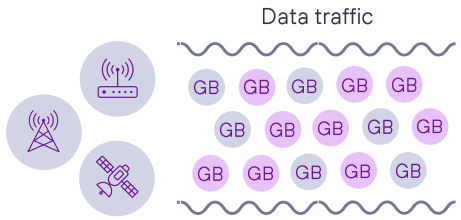


Mobile broadband (5G/6G) needs spectrum in low, mid and high bands to enable all its use cases.



High bands (>24 GHz)	*Very high capacity, but short range*
Mid bands (1–24 GHz)	*Optimal balance between capacity and range*
Low bands (<1 GHz)	*Lower capacity, but long range*

Radio spectrum is a public resource managed by public administrations. They must address excess demand, especially in the low and mid bands.



Towards a balanced and efficient spectrum policy

Payments to the public administration for spectrum usage rights are growing faster than revenues

The cost of spectrum is growing faster than the sector's revenues, limiting resources for investment and worsening network coverage and quality.

The expiry of licences causes harmful discontinuities

Disincentive to invest in an asset whose future availability is uncertain, which could affect future innovation.

Lower liquidity in the secondary spectrum market.

Micromanagement of supply generates preferential treatment and inefficiencies.

Unjustified reservations for solutions that compete with mobile.

Discriminatory treatment in pricing.

Barriers to network and service evolution and innovation.

Unrealistic competition targets lead to inefficient allocation

Artificially maintaining a high number of competitors through reservations for new entrants or excessively low spectrum limits creates artificial scarcity and undermines efficiency.

Create a regulatory environment for spectrum that facilitates investment and enables Europe to meet its ambitious connectivity and digitisation goals

1 Prioritise the promotion of investment and innovation

Ensure that public administrations do not use spectrum to maximise the revenue they receive from usage rights at the expense of efficiency and investment.

Prevent reserve prices at auctions from exceeding the value of spectrum for uses that, for one reason or another, are excluded from competitive processes.

Set spectrum usage fees that reflect the evolution of the sector's revenues and profits.

2 Increase certainty about the duration of licences

In new bands, grant indefinite or automatically renewable licences.

Create expectations for the renewal of existing licences if obligations are met and efficient use is made of the spectrum.

3 Avoid artificial spectrum scarcity for mobile services

Provide for an increase in the supply of spectrum for mobile services to meet the growth in demand for connectivity and facilitate the introduction of new technologies.

4 Create efficient balanced conditions in cases of spectrum sharing

The promotion of shared use should be carried out while minimising the impact on service quality and without creating excessive management burdens for spectrum users.

5 Allow mobile operators to leverage scale to compete

Accept that mobile networks are subject to economies of scale, meaning that a greater number of networks is not always the most efficient or beneficial for end customers.

Avoid imposing spectrum limits and reserves on new entrants that create artificial scarcity.

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Towards a Fair Relation between Players in the Digital Ecosystem

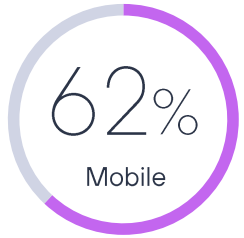
The evolution of digital services is transforming traffic behaviour patterns on the network

The increase in downlink and uplink data traffic is straining network capacity, which requires investment in a context where it is difficult to monetise this traffic due to imbalances in bargaining power.

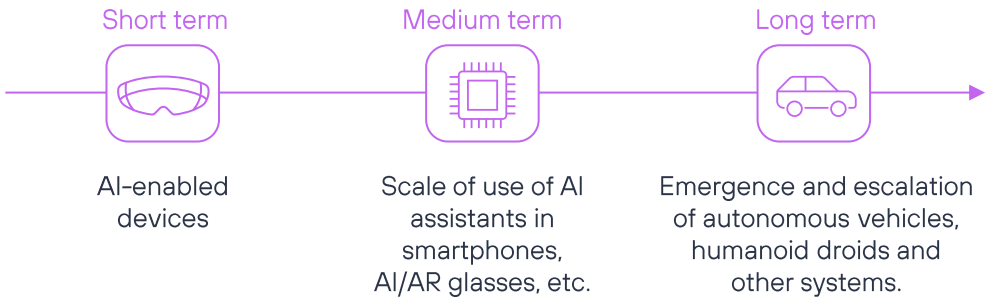
The focus of current traffic remains on *downlink*. Large traffic generators continue to drive demand for high-quality connectivity to access advanced digital services.

Global internet traffic share[1]

Alphabet · Meta · Microsoft · amazon · Disney+ · NETFLIX · TikTok



The increase in *uplink* data traffic is accelerating due to the convergence of AI, the cloud and mobility. This will lead to a significant increase in demand for uplink capacity on networks[2]



Network capabilities that support the evolution and quality required by digital services

Risk of not being able to guarantee service quality due to a lack of mechanisms for efficient traffic management caused by non-responsible use of network resources

The lack of responsible use of network resources can lead to non-resilient networks that are unable to support the technological evolution of digital services, which require ever-increasing capacity (speed, lower latency and quality).

Absence of a clear and fair regulatory framework for resolving commercial disputes

The imbalance in bargaining power among actors in the Internet value chain hinders efficient traffic management.

Absence of a clear and agile process for resolving commercial disputes between operators and content and application providers (CAPs) in the EU.

Advance the sustainability of network investments by ensuring balanced service provision agreements between telecommunications operators and large traffic generators, thereby also encouraging responsible and efficient use of the network

1. Promote responsible and efficient use of the network

Promote mechanisms to optimise traffic and improve the management of digital resources, encouraging collaboration between actors in the digital ecosystem. It is also essential to support the development of resilient networks that can withstand the technological evolution of digital services, which are increasingly demanding greater capacity.

2. Establish a binding dispute resolution mechanism for cases where no voluntary agreement can be reached between companies providing services in the Internet value chain

Design a mechanism that guarantees the conclusion of an agreement with fair terms and conditions in the event that commercial negotiations are unsuccessful, ensuring balanced negotiation between companies providing services across different segments of the Internet value chain.

3. Expressly establish for the EU as a whole: 1) the guidelines to which the adjudicating authority will be subject and 2) a short deadline for resolution

Ensure balanced and consistent criteria for the EU as a whole, accompanied by the power to resolve disputes within a short timeframe. The certainty of a rapid and effective dispute resolution mechanism will be the greatest incentive for operators and content and application providers (CAPs) to prioritise reaching agreements resulting from commercial negotiations.

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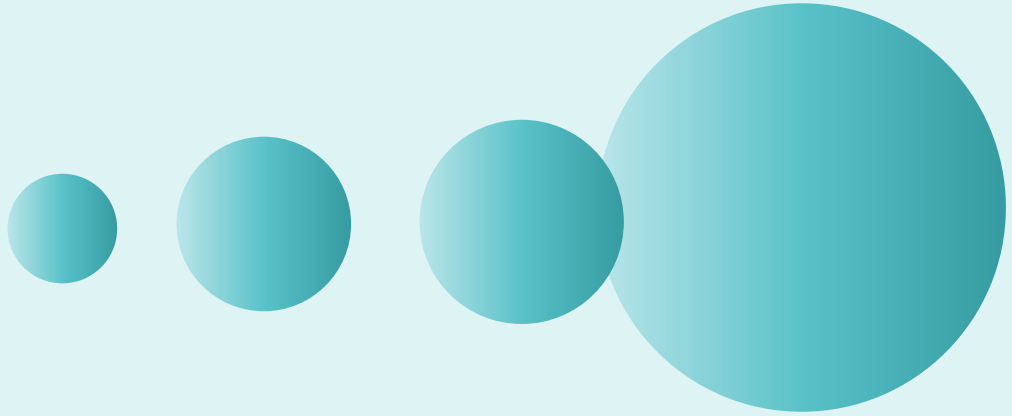
Technological Innovation

Innovation means combining technology, talent and strategic vision to create solutions that drive transformation. In a context of technological convergence –telco-edge-cloud connectivity, artificial intelligence, cybersecurity, post-quantum security– it is essential to have robust digital infrastructures.

The telecommunications sector, with its high-capacity networks, advanced technology platforms and innovative security solutions, contributes to the consolidation of an innovative, secure and resilient European digital ecosystem.



08

Cybersecurity: The Invisible Shield of the Digital Age

Digital security as a critical asset

Cybersecurity and digital security is...

- A key pillar of society
- A shared responsibility of the public and private sectors
- A driver of innovation due to its spillover effects and dual-use nature

Being cyber resilient is more pressing than ever.

We are in a new era of growing risks and uncertainty, with the continuous increase in cyberattacks, data leaks, fraud and cyber espionage highlighting the critical need for more effective security and industrial frameworks.

Global cost of cybercrime and fraud **9.22 trillion** in 2024[1]

Number of cyberattacks per organisation **1,925 per week** in the first quarter of 2025[2]

The telecommunications sector, and Telefónica as a trusted company with solid experience in protecting critical infrastructure and various sectors, as well as highly qualified personnel, is positioned as a strategic partner for achieving security, resilience and sovereignty.

Regulatory complexity and fragmentation compromises security

A fragmented and highly complex regulatory landscape

Although establishing a regulatory framework is crucial to strengthening basic cybersecurity, growing regulation and lack of alignment are major challenges.

Duplication forces companies to devote more resources to technical compliance without improving cybersecurity outcomes.

Insufficient funding

Investment gap and lack of technical resources in both the public and private sectors.

Economic analyses and funding strategies do not consider the indirect effects of insufficient funding.

Difficulty in achieving cyber resilience and combating cybercrime

Interdependencies in the international supply chain subject to non-common national regulations.

Geopolitical tensions that hinder international cooperation and the fight against cybercrime.

Mismatch between the sophistication of technology and access to talent

The growing complexity of digital systems poses a challenge for end-to-end security.

Shortage of professionals and lack of a strong cybersecurity culture.

Develop cyber resilience and increase digital trust for inclusive digitalisation through better collaboration, fit for purpose frameworks, capacity building and incentives

1. **Ensure a robust and sustainable telecommunications sector**
   Promote a robust and economically sustainable telecommunications sector, based on trusted operators, acting as a key regional technology partner for governments and businesses.

2. **Boost investment in security, resilience and dual-use technologies**
   Increase investment through public funding and tax incentives for security, resilience and dual-use technologies, and use public procurement strategically.

3. **Implement a simplified regulatory and security standards framework**
   Adopt a simplified, proportionate, internationally aligned, consistent, risk-based regulatory and security standards framework, developed in close collaboration with the private sector.

4. **Promote the development of skills in technology and cybersecurity**
   Encourage the development of skills in technology and cybersecurity, while promoting greater awareness of digital security and fraud to foster a more resilient digital society.

5. **Improve coordination and cooperation against crime**
   Improve coordination in cyber intelligence, cyber defence, deterrence and the fight against cybercrime, ensuring greater resources and closer cooperation.

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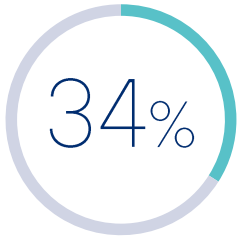
09

Post-Quantum Security

Quantum computing: the next major technological disruption



There is a 19% to 34% probability that within the next decade there will be a quantum computer capable of breaking the main cryptographic systems currently used on the internet[1].

Although approximately one-third of the world's quantum companies are located in the EU[2], there is an investment gap compared to other powers.

United States

Europe

Percentage of private capital flow in quantum companies 2024[2].

Quantum technologies will open up transformative opportunities, but will also pose challenges, particularly in relation to cryptography and security.

Europe seeks to strengthen its position in quantum technologies and post-quantum security.

A future challenge that requires preparation in the present

Ambitious deadlines for quantum security with limited implementation tools

The future ability of quantum computers to break current public key cryptography poses a security risk. This makes early action on post-quantum cryptography a strategic necessity.

Although the EU roadmap sets out clear milestones, deadlines alone are not enough to migrate to secure cryptography. There is a gap in practical guidance, testing frameworks, certification schemes, funding and best practices to support real, large-scale deployment.

Fragmented governance and insufficient and mismatched funding

Quantum and post-quantum initiatives are scattered across EU and national programmes, limiting scale, coherence and impact.

Existing co-funding schemes are complex and largely designed for mature, capital-intensive, low-maturity infrastructures. This slows down the transition from research and pilot projects to sustained deployment.

Weak industrial scale and deficit in operational capabilities and skills

Europe attracts limited private capital and has a small share of quantum patents globally.

There is a lack of trained, specialised and operationally ready talent in the various sectors.

Promote European quantum technologies and create a secure environment prepared for the cryptographic challenges that quantum computing will introduce

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1. Adopt a holistic and technologically neutral approach, including security

The Quantum Act must integrate quantum and enabling technologies, in particular post-quantum cryptography (PQC) together with Quantum Key Distribution (QKD), ensuring interoperability at EU level and alignment with the European Cryptography Roadmap, to deliver resilient and future-proof digital infrastructures.

2. Recognise telecommunications operators as key players in the European quantum ecosystem

Design policies that support the long-term relevance and sustainability of operators, enabling them to leverage their unique position to translate quantum and post-quantum technologies into secure, scalable, real-world deployment.

3. Reorient public funding towards industrial deployment and scaling, improving the design of financial instruments

Simplify governance and improve the coordination and accessibility of public funding, going beyond research to prioritise projects with higher technology readiness levels (TRL), such as pilots, certification and deployment of secure quantum infrastructures.

Encourage higher aid intensities and specific programmes, drawing on precedents such as broadband deployments, to bridge the gap between scientific leadership and industrial impact, even if these are not strictly considered quantum technologies.

4. Strengthen industrial sovereignty, standardisation and supply chains

Leverage innovation-oriented public procurement, prioritise participation in international standardisation bodies, promote European-owned intellectual property and secure critical components to strengthen strategic autonomy across the quantum value chain.

5. Make skills and talent a cross-cutting priority

Invest in skills and competences, including training, reskilling and specialised knowledge, especially in post-quantum security, to support long-term deployment and competitiveness.

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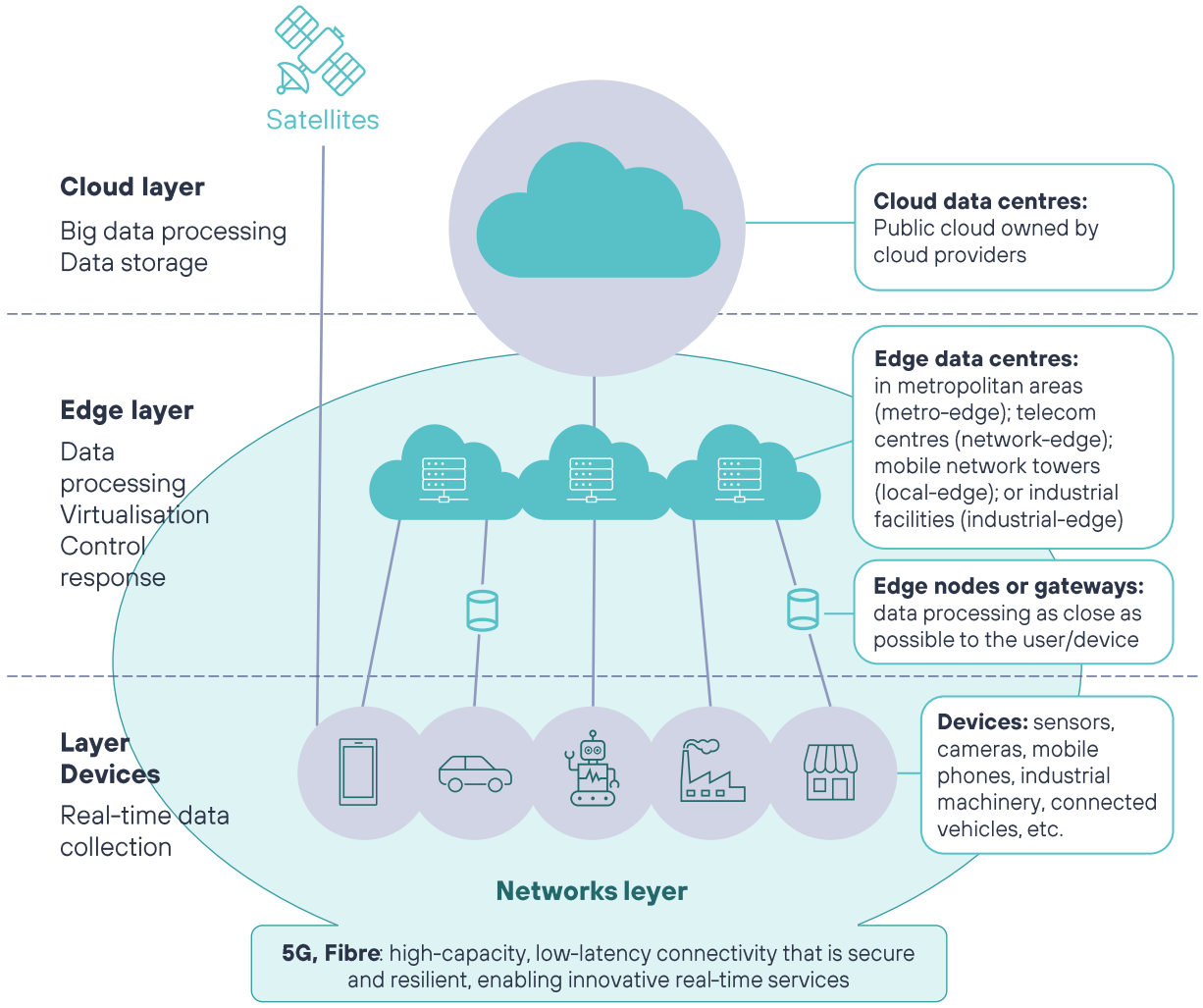
Towards the Telco-Edge-Cloud Paradigm

New telco-edge-cloud paradigm: Technological convergence integrates cloud, edge, and fixed and mobile connectivity



Towards a new era of connectivity that drives digital innovation

Outdated regulatory frameworks increase the risk of widening asymmetries in the value chain

Regulatory frameworks are not adapted to the new reality of connectivity, defined by virtualisation, "softwarisation", AI and advances in quantum security, and by an expanded ecosystem of competition and cooperation.

Regulatory frameworks that are not adapted in time to keep pace with technological convergence creates an imbalance in access to investment and development opportunities for different players.

Differences in scale and obligations between actors in the telco-edge-cloud paradigm widen imbalances and jeopardise the sustainability of digital innovation

Risk of market power concentration, regulatory asymmetries, and forms of unfair competition that limit the ability to innovate on a level playing field.

New players, with large volumes of traffic and private networks, have transformed the interconnection market. Peering (between equals) with clear imbalances in bargaining power.

Regulations such as Open Internet respond to a market reality that bears little resemblance to the current one, where networks, cloud and CDNs converge, limiting innovation.

Spectrum policy disproportionately burdens mobile networks compared to other technologies (WiFi, private networks or satellites). This limits efficiency in the deployment of critical infrastructure.

Technical and regulatory obstacles may hinder the European Union's strategic aspiration for a sovereign *cloud*

Update regulatory frameworks to reflect the new reality of connectivity and ensure balanced telco-edge-cloud connectivity where all players can invest and innovate

1 Ensure that digital regulation considers technological convergence

Ensure that the review of existing regulations or the creation of new regulations, such as the European Digital Networks Act (DNA), address the connectivity ecosystem from a comprehensive perspective, taking into account the new paradigms that are emerging as a result of accelerated technological convergence.

2 Promote horizontal regulatory frameworks applicable to all digital players

Promote uniform regulation through horizontal frameworks applicable to all players in the value chain that address privacy, consumer rights and security, replacing specific telecommunications sector obligations.

3 Promote fair relations and cooperation between players

Apply principles of regulatory fairness based on the nature of the services offered, rather than on the inherited identity of the provider.

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.

Establish a mandatory dispute resolution mechanism to enable fair commercial agreements between operators and large application and content providers or cloud service providers.

Encourage commitments to sustainability and responsible traffic management throughout the value chain.

4 Enable telecommunications operators to gain scale

Update EU competition policy to adapt it to a global market dominated by large-scale players in order to promote sustainable markets and stimulate investment.

Adapt regulatory remedies:

a. Promote regulatory remedies adapted to the new digital era, focused on greater efficiency in terms of consumer welfare and investment.
b. Avoid imposing structural remedies that artificially favour the entry of new players under privileged conditions.

Incorporate industrial and strategic vision into merger control:

a. Update the merger control framework with a long-term vision that incorporates industrial and strategic considerations.
b. Broaden the concept of consumer welfare

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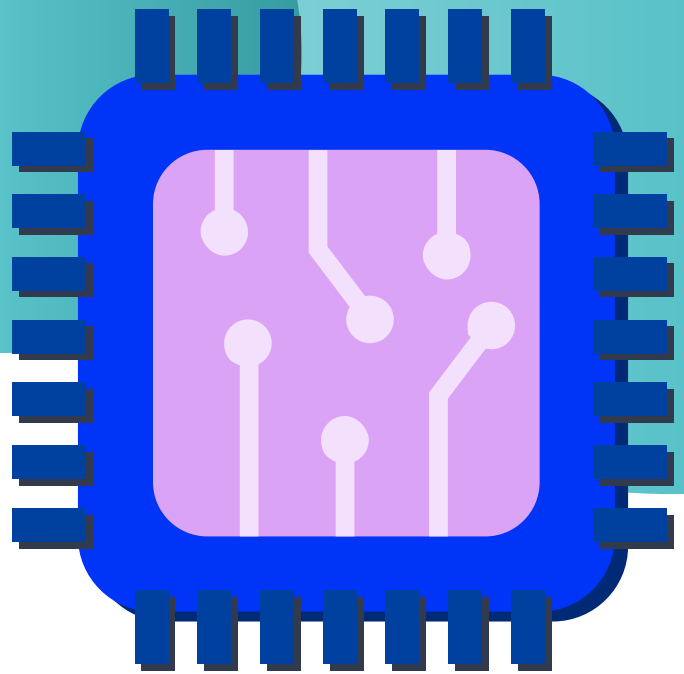


Artificial Intelligence Industrial Policy

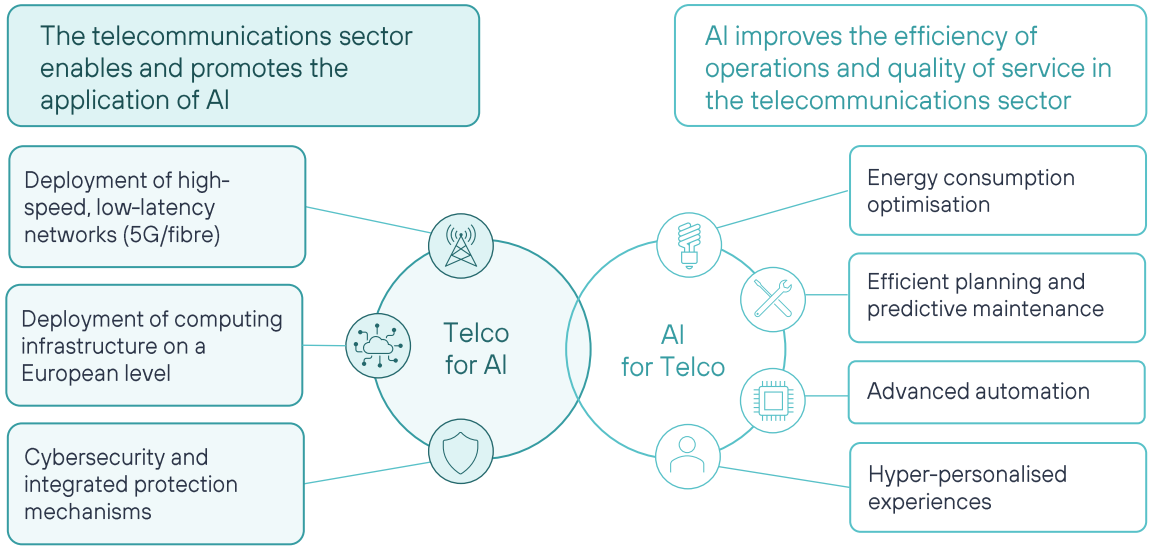
Context

From industrial policy to the application of AI

Artificial intelligence (AI) is no longer just a technology, but also a critical factor in European industrial policy.

The European Commission has recognised this new dimension of AI, with industrial policy being a key lever for turning this technology into a real factor of production in all economic sectors, especially strategic ones.

The telecommunications sector is strategic for European AI objectives.

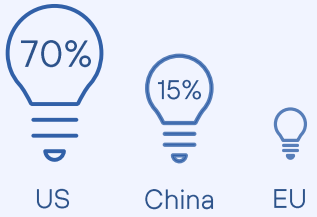


Challenges

Fair competition in AI and telecommunications markets

Innovation gap

The United States has developed 70% of AI foundational models since 2017, while China has developed 15%[1]. Furthermore, leading LLMs are not being developed in Europe.



Competitive asymmetries between different types of players in the digital ecosystem

Lower investment capacity and scale in Europe compared to other tech powers.

Structural advantages in data, computing and talent of large non-European digital companies.

Telco for AI requires competitive conditions to deploy AI platforms, cloud-edge services, and data capabilities on a level playing field.

AI for Telco requires an environment where operators can innovate and automate without disproportionate regulatory burdens compared to other digital players.

Risk of technological dependence

Europe may remain anchored in non-European AI technologies and models.

The growth of European digital companies –both as AI enablers (Telco for AI) and advanced users (AI for Telco)– is limited and subject to third parties.

Promote the deployment of advanced and resilient networks, such as 5G and fibre, to turn artificial intelligence into a lever for the transformation of all economic sectors

1 Promote an industrial policy that recognises the strategic role of the telco sector in AI (Telco for AI)

Position telecommunications operators as a central pillar of European AI infrastructure, supporting the deployment of data capabilities, cloud-edge, advanced connectivity and cybersecurity. This will accelerate the development of European models and strengthen strategic autonomy.

2 Facilitate the adoption of AI in the telco sector (AI for Telco)

Establish an enabling regulatory framework that allows operators to integrate AI into networks, operations and services with flexibility, clarity and less administrative burden, especially in areas of automation, energy efficiency and customer service. This will have a positive multiplier effect on the European economy as a whole.

3 Ensure a competitive level playing field

Avoid asymmetries between highly regulated European operators and large global platforms that are less subject to equivalent obligations. The EU should promote balanced standards, interoperability, fair access to data and a level playing field, so that operators can compete and scale AI technologies on equal terms.

4 Align regulation, standards and financing to accelerate responsible innovation

Coordinate regulatory (AI Act), technical (open standards, sandbox testing) and financial (European industrial mechanisms) tools to create an environment where AI innovation is secure, scalable and interoperable. This will enable Europe to close the gap with the United States and China, promoting a robust ecosystem around Telco for AI and AI for Telco.

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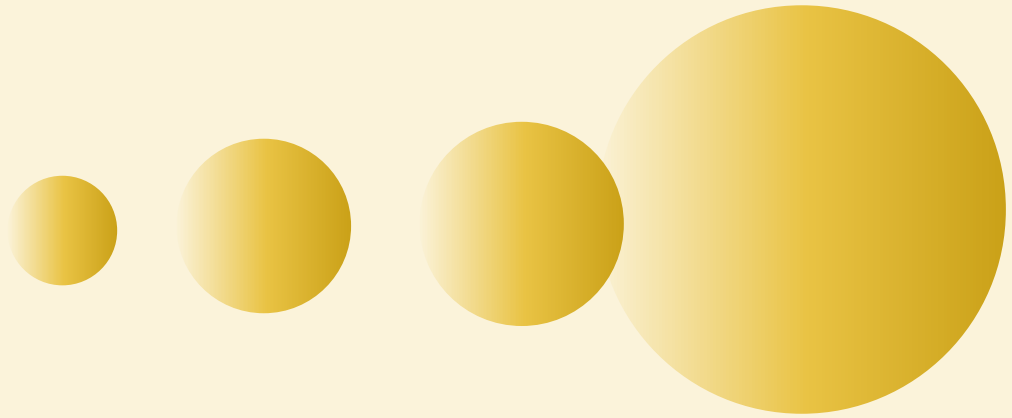
Sustainability and Inclusion

A competitive and innovative digital transformation of our economy should ensure the safe participation of people —particularly, vulnerable groups— promote the sustainable use of natural resources and deliver a meaningful digital inclusion.

The telecommunications sector is aligned with this vision, playing a key role in shaping a digital era that is sustainable, inclusive and centred on well-being.



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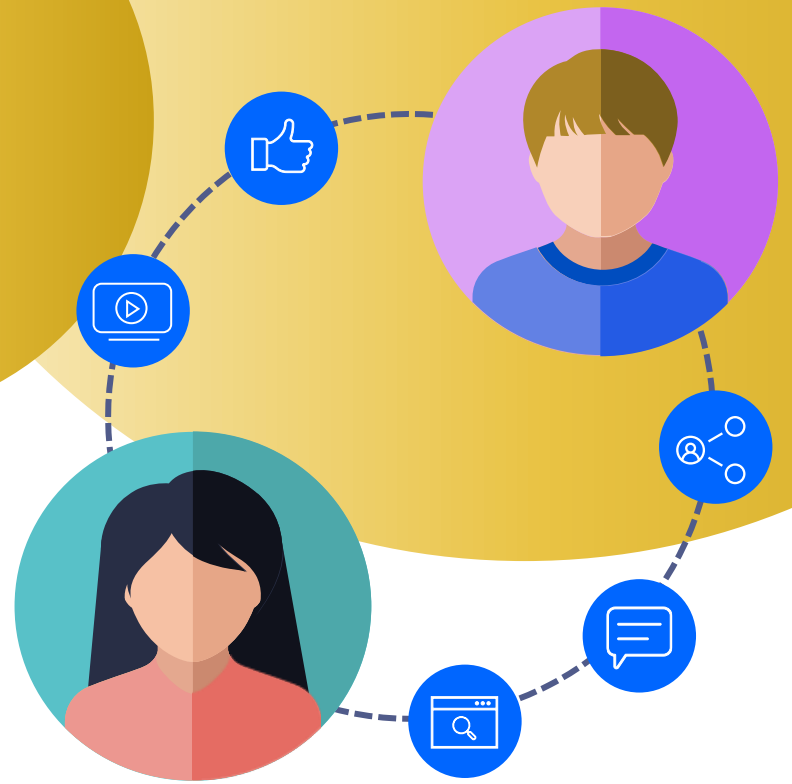
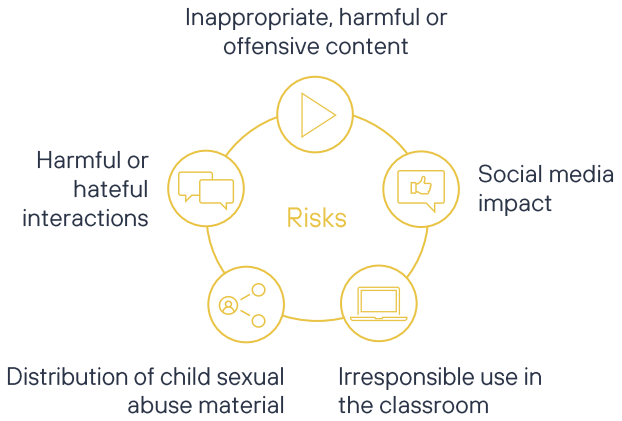


From Analysis to Action: Towards Effective Child Protection

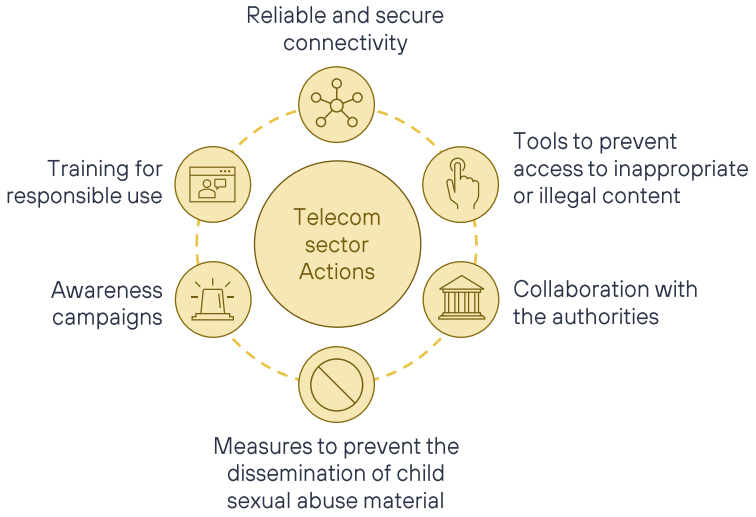
Protection based on responsible use and design

Younger generations have grown up immersed in constant change, developing an intuitive relationship with digital devices and services from an early age.

In response to potential risks, the concept of responsible use has long been promoted. However, experience has shown that this approach alone is insufficient, and that equal emphasis must be placed on responsible design.



Operators contribute to the digital protection of minors at various levels



However, these measures are not sufficient to ensure comprehensive protection for minors in digital space.

Addressing this challenge requires a shared responsibility, aligned with the roles and activities of each actor in the digital ecosystem.

Towards safe and tailored digital participation

Absence of widely implemented age-verification systems

Fragmentation in the development of systems, both private and public.

Uncertainty about compliance with privacy guarantees.

Possible resistance from civil society due to lack of trust.

Lack of understanding that protecting minors in the digital environment is a shared responsibility

Insufficient coordination between regulation, the education system and the responsible design of digital technology and services.

Possible negative influence on the development, attitudes and behaviour of minors

Presence of features that seek to maximise the time minors spend online.

Obscure patterns that induce minors to consume unnecessarily by exploiting their vulnerability to external influences.

Algorithm-based content recommendation systems that may result in the dissemination of inappropriate or hateful material.

Insufficient awareness and training

Lack of programmes aimed for minors as part of the educational curriculum to raise awareness of the risks they are exposed to and to train them on how to mitigate them.

Insufficient support for families to raise awareness of the risks and measures to address them.

Excluding minors from the digital environment is not the solution; instead, we must ensure safe, age-appropriate participation. To achieve this, a holistic child protection strategy is needed, one built on shared responsibility across all stakeholders

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1 Ensure effective age verification that respects privacy

Self-declaration should not be considered a valid method of age verification, as it lacks any accountability mechanism.

Platforms should be able to implement any age verification system available on the market, provided that the method chosen is proportionate, effective and offers solid guarantees of privacy and data minimisation.

To avoid fragmentation, age verification solutions should follow common standards and protocols that allow for the implementation of interoperable, scalable and rights-respecting age verification mechanisms.

Age verification should not only be used to determine whether a person is over 18, but also to establish age ranges that allow the platform's functionalities to be adapted to the level of development of minors (e.g. on social media).

2 Ensure the effective application of Article 28 of the Digital Services Act

The protection of minors in digital environments does not require new regulation, but rather the effective application of existing regulations.

The application of Article 28 based on the guidelines published by the European Commission is the most comprehensive regulatory tool for promoting a safe digital space for children and teenagers.

3 Avoid greater asymmetries between players in the audiovisual and digital ecosystem

Recognise compliance with current regulations by operators who also act as content providers. For example, in Europe, such operators comply with the Audiovisual Law and the Digital Services Act. Therefore, imposing greater responsibility outside their activity would generate greater regulatory asymmetries in the digital ecosystem.

4 Promote the adoption of responsible design in the digital environment

Promote the development of a Code of Conduct based on the voluntary participation and commitment of digital platforms. This code should include best practices for addressing risks such as the development of addictive behaviours, inappropriate contact between adults and minors, and damage to mental health due to comments or visual content unsuitable for minors, among others.

5 Offer courses, awareness-raising activities and tools for responsible use

Offer awareness-raising activities for minors from an early age, as well as training adapted to their level of development to ensure responsible use of digital devices and services.

Provide the necessary training and tools to family members, guardians and teachers.

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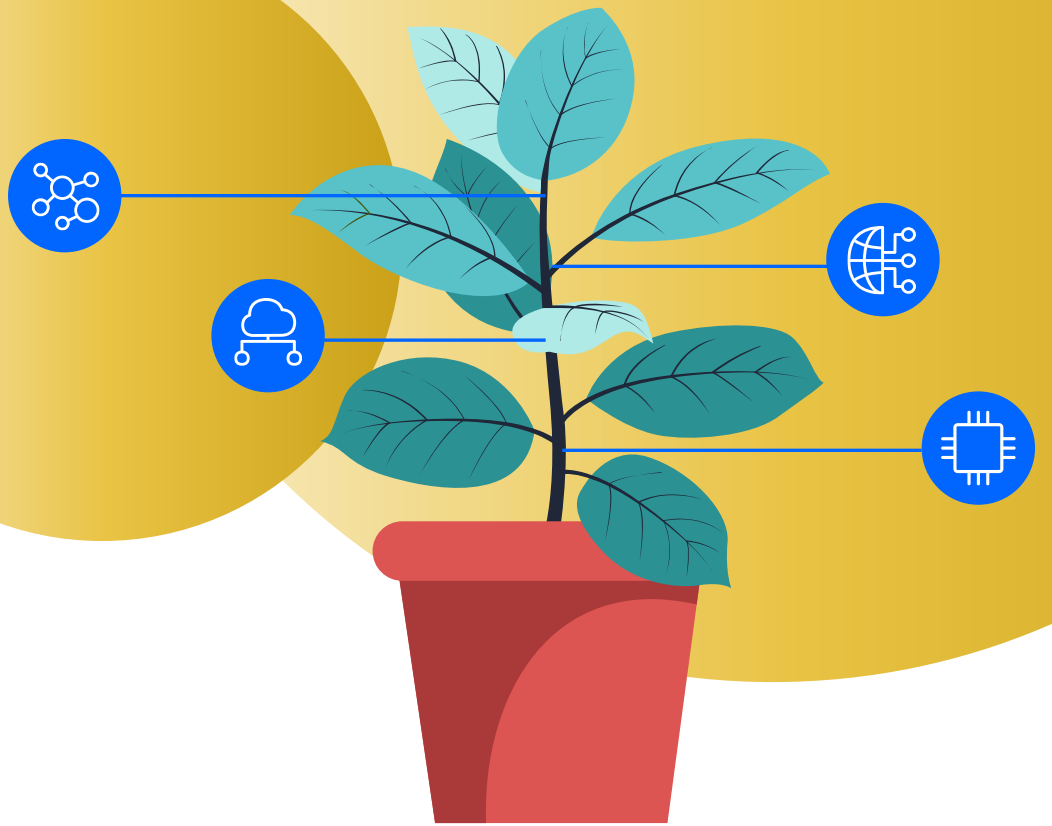
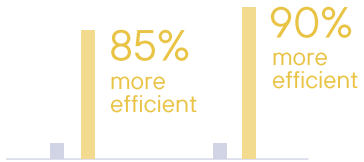


Digitalisation as a Link between Competitiveness and the Green Agenda

Connectivity and digitalisation for competitive sustainability

Sustainability in the telecommunications sector

Energy efficiency[1 y 2]



Renewable consumption[2]

100% renewable by 2030

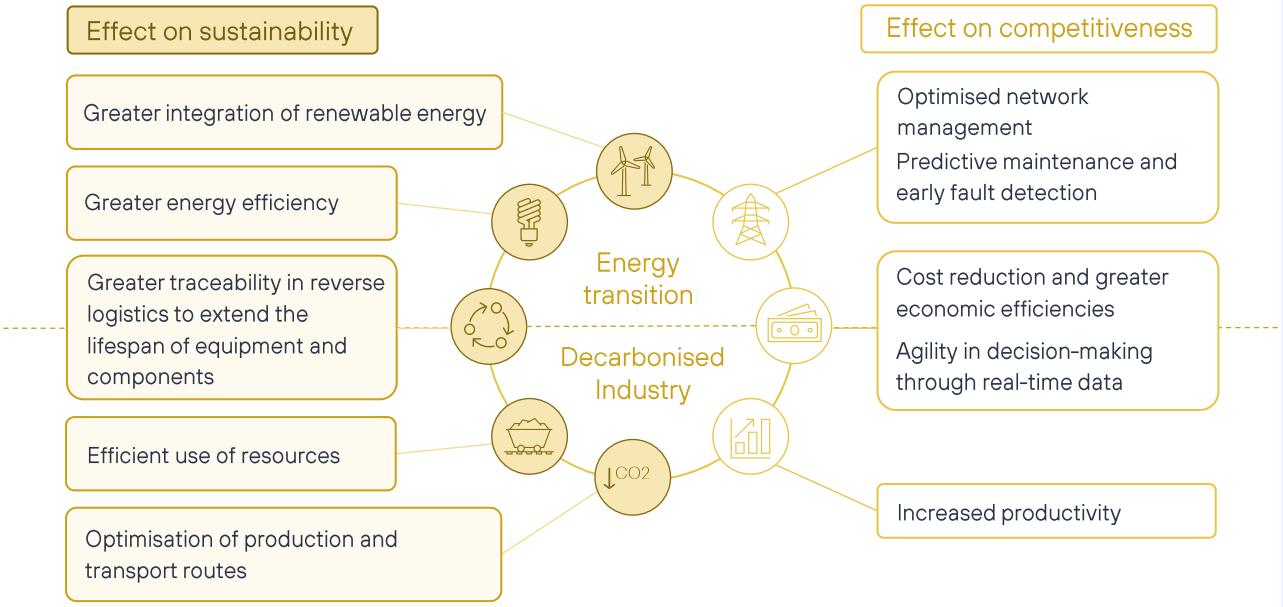
Telefónica aims to achieve 100% renewable electricity in all its markets by 2030

Circularity[2]

Zero Waste by 2030

Telefónica is committed to becoming a zero-waste company by 2030

Enabling effect for the EU's competitive sustainability



Challenges for efficient connectivity and promotion of the enabling effect

Forecasts of increased traffic requiring greater efficiency in telecommunications infrastructure

Lack of incentives to accelerate the deployment of new networks and to make efficient use by service and content providers.

Insufficient promotion of infrastructure sharing.

Need to promote long-term renewable energy purchases (PPAs).

Lack of promotion of the sector as a lever for decarbonising the economy

Lack of recognition of network infrastructure within the EU Taxonomy to support the deployment of next-generation, energy-efficient networks.

Lack of recognition of the telecommunications industry as an electricity-intensive sector, which prevents its eligibility for decarbonisation aid to implement energy-efficiency measures.

Insufficient promotion of the enabling effect of digital solutions for decarbonising industry

Underestimation of digital solutions as a viable pathway for industrial decarbonisation support undermines their inclusion in aid schemes. As a result, European industry is discouraged from adopting digital technologies that could accelerate its decarbonisation efforts.

Lack of incentives for circularity

Lack of regulatory harmonisation, clear definitions and administrative burden.

Need to promote fair competition through market monitoring and digital traceability.

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Enhance synergies between digital solutions, sustainability and competitiveness, relying on more efficient next-generation networks

1 Encourage the transition from legacy networks to efficient, state-of-the-art networks

Create financial or fiscal incentives to support the transition from less efficient legacy networks to next-generation, energy-efficient networks.

Do not set a date for the *legacy* shutdown, as each national context is different, as are the efforts required.

Promote this transformation through tools such as green and sustainable financing within regulatory frameworks and international standards.

2 Promote the decarbonisation of the telecommunications sector

Recognise electronic communications networks as a new EU Taxonomy activity to accelerate infrastructure decarbonisation and advance the sustainability of the Digital Decade objectives.

Include telecommunications companies in decarbonisation aid schemes, such as PERTE, to support the implementation of energy-efficiency measures and reduce energy consumption in high-intensity facilities, including telephone exchanges and data processing centres.

3 Recognise digitalisation as a key lever for decarbonising the economy

Give digital solutions a more prominent role in Europe's decarbonisation plans and strategies.

Include digital solutions as a distinct line of action within aid frameworks, such as the PERTE for Industrial Decarbonisation and the State Aid Framework for the Clean Industrial Deal.

Promote private financing of digital solutions and other taxonomic services.

4 Promote long-term renewable energy purchase agreements (*PPAs*)

Provide greater facilities for companies to enter into long-term renewable energy purchase agreements.

Harmonise the application of long-term renewable energy purchase agreements in Member States.

5 Move towards a Single Market for circularity

Create a circular Single Market with harmonised regulations and clear definitions for the end of life of products, using digital tools and a European digital passport to reduce administrative burdens without losing traceability.

Ensure fair competition and market surveillance to consolidate a transparent and equitable circular environment, as well as promoting the circular transition with tax incentives for good practices.

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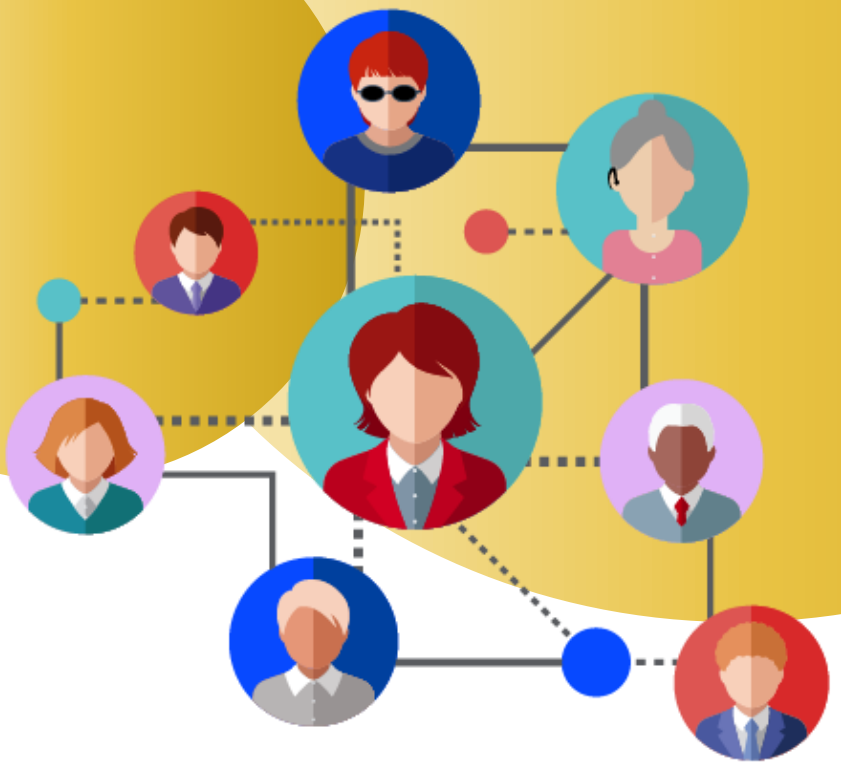
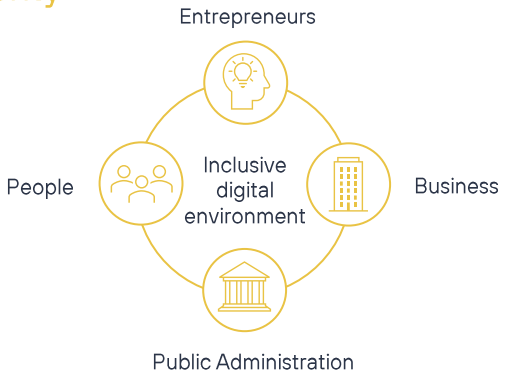


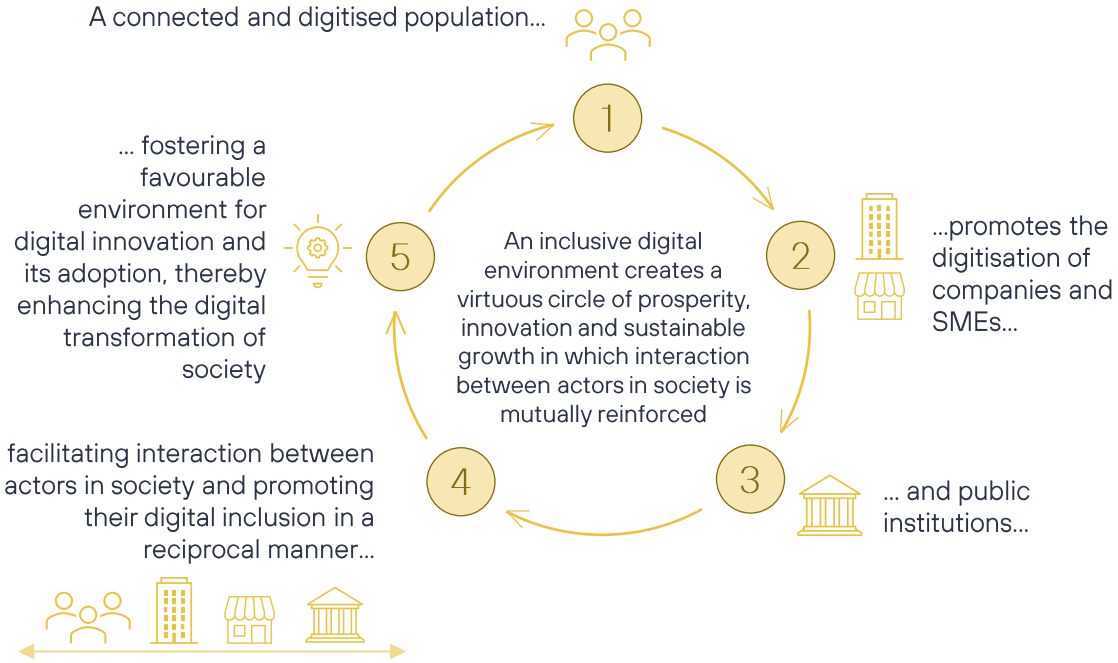
Digital Inclusion for Shared Prosperity

Digital inclusion is an engine of prosperity

Digital inclusion is key to achieving a more cohesive society with greater well-being and better economic integration into local and global markets.



A well-paced digital inclusion fosters a virtuous circle between supply and demand.



The gaps to achieving greater prosperity

Digital innovation activities are concentrated in a few companies and countries

- Unequal access to the financial resources needed for innovation or entrepreneurship.
- Complex and inflexible regulatory environment that discourages innovation.
- Challenges in attracting and retaining qualified professionals.

Weak digital transformation of public administration services

- Lack of a digitisation strategy for public administrations.
- Need to implement robust cybersecurity systems that effectively protect sensitive data belonging to the population and companies.

Low level of digitisation of small and medium companies (SMEs)

- Lack of awareness of the importance of adapting supply to the evolution of digital demand.
- Limited use of digitalisation opportunities to access new markets.
- Limited access to financing, infrastructure and technology.

Persistence of the usage gap

- Lack of accessibility for people with disabilities.
- Lack of trust in technology due to concerns about privacy loss, fraud, cyberattacks, and loss of control.
- Low level of digital skills.
- Limited affordability of devices and access.

Drive meaningful connectivity and digitalisation to achieve full digital inclusion.

1 Promote better inclusion in the global digital economy

Consolidate innovation hubs that promote technological ventures "from lab to market".

Encourage high-impact technological ventures.

2 Accelerate the digitisation of public administration

Develop digital platforms for access to public services, ensuring a user-friendly interface that is accessible to all citizens and businesses, taking into account their specific needs, and in a uniform and interoperable manner across the different levels of government.

Accompany the digitisation of public administration with training courses for those who are not familiar with the use of digital devices and services.

3 Promote the digitisation of small and medium companies (SMEs)

Promote digital training programmes for SMEs.

Promote specific programmes or funds to subsidise the adoption of digital technologies or services by SMEs.

Create an accessible and user-friendly platform with information on grants or aid available for digitisation, technology partners, and advice tailored to the digital maturity of the company.

4 Accelerate efforts to reduce the digital usage gap

Promote the accessibility of digital products and services by integrating clear standards, facilitating the understanding of regulations, promoting accessibility training, and encouraging public-private partnerships to ensure universal inclusion.

Build trust in the use of technology by respecting personal data protection and strengthening cybersecurity, developing educational campaigns on risks and best practices, and promoting transparent environments that maintain user control over their data.

Promote digital skills through public-private collaboration and incorporate them into the education system from an early age, extending the scope to older people and those seeking to improve their employability.

Improve affordability by reducing the tax burden on devices and establishing direct subsidy mechanisms.

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