

Connect
Europe

Europe's Digital Choice


Our Policy Agenda For A
Connected, Competitive
and Innovative Continent



Connect Europe

Who We Are

Connect Europe is the voice of the leading connectivity providers in Europe. Our 42 members are at the forefront of innovation in the telecom and technology ecosystem, offering cutting-edge digital networks and advanced services that connect over 274M Europeans. Together, our members represent over 70% of the total telecom sector investment in Europe, driving the digital transformation of the Continent. Building on ETNO's success, Connect Europe takes a step further and champions a positive policy environment that enables European connectivity networks and services providers to make Europe prosper.



CONNECTIVITY

Connectivity: the case for doing more and doing it now

Digital connectivity is the infrastructure that underpins competitiveness, growth and socio-economic prospects in our century. Today, 76% of European citizens [see](#) advanced connectivity as essential in improving their lives and socio-economic condition. The large majority of Europeans also [consider](#) that technologies such as 5G are important for the future of businesses and for innovation. We also [know](#) that digital technologies, including advanced connectivity, are a necessary tool to achieve our climate goals.

Building on years of intense telecom investment, today 89% of Europeans [enjoy](#) 5G, while 64% of our households are reached by fibre. However, much more work remains to be done if we are to enable a competitive European economy and ensure that European networks become greener, more resilient, and state-of-the-art in terms of innovation – embracing new developments such as softwarization, cloudification, artificial intelligence (AI), and network-as-a-service.

A series of gaps are affecting the strength of Europe's connectivity ecosystem. This, in turn, limits the ability of our companies – big and small – to grow and compete globally. Also, it puts a break on the development of our communities: from cities looking to grow smarter to young innovators wanting to create the next tech start-up.

In 5G for industrial applications, Europe is currently trailing Asia: at the end of 2023, we counted 10 operations 5G Standalone networks, compared with over 17 in Asia. In edge-cloud, which brings computing capacity close to the end user, Europe counted 4 commercialised offers in 2023, trailing both the Asia-Pacific region (17 offers) and North America (9 offers). In Open RAN – the most flexible form of radio access network – Europe is seeing its own vendors look at other geographies, such as the US, where strategic public investment is supporting manufacturers and telecom operators. We should change gear, now, to achieve the EU Digital Decade Programme as agreed and approved by the EU institutions.

Almost 20 years ago, Europe lost its leadership in the mobile ecosystem to the smartphone revolution. In the same period, it was unable to build strong tech companies to lead in the consumer internet world. Today – with connectivity ecosystems being reshaped by fast-paced innovation and gigantic network investment needs – we have a choice to lead again or to pass a major historic opportunity. This will also help us fulfil the European declaration on Digital Rights and Principles.

Connect Europe and its members stand for the choice to seize the opportunity and “lead” the connectivity ecosystem. It is a bold vision, but it is one that we should work to achieve. We have our customers at heart: the small business owners who strive to do better, to grow, to compete globally; citizens, wherever they are, who want to work, enjoy entertainment at home, and stay connected with their loved ones; the mayors of big and small cities who want to offer better public services and make their towns less polluted and more attractive to investment; the CTOs and CIOs of major European corporations and manufacturers who want to go out and take the world, one innovative product at a time.

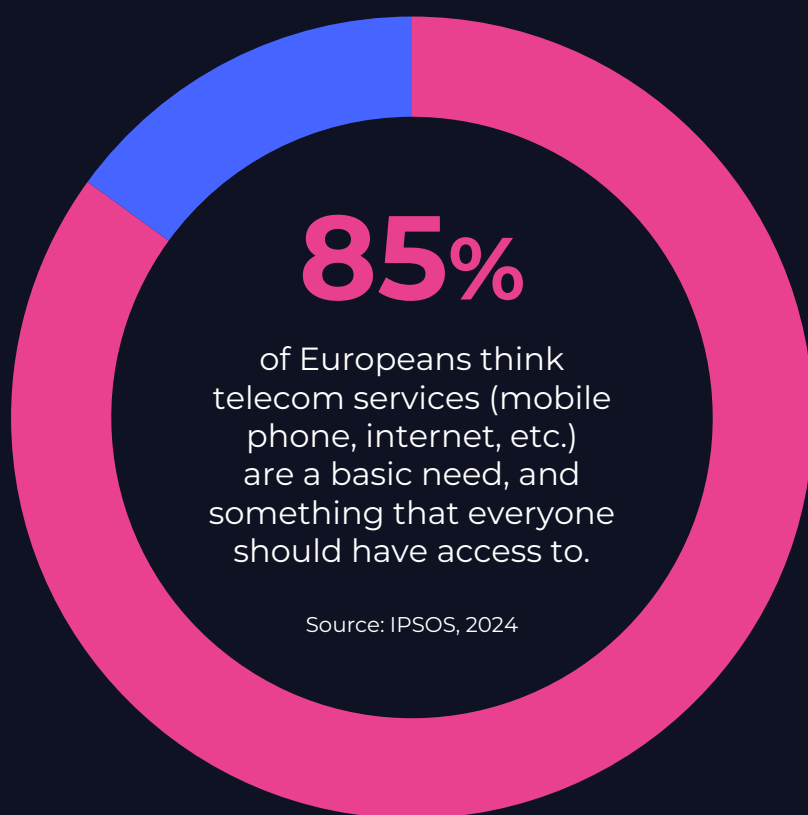
European decision-makers can do a lot to achieve this vision. Here are the foundations for a new and brave policy that delivers a Connected, Competitive and Innovative Continent:

- ▶ Strengthen Europe's digital networks to serve European citizens and businesses
- ▶ Advance the European digital single market to grow stronger, greener and deliver more innovation
- ▶ Reinforce Europe's digital footprint and global competitiveness
- ▶ Commit to a leaner and simpler policy framing to unleash growth and investment

In the upcoming chapters, we will explore how telecom networks, services, and society at large are evolving through the digital and green transition, and what policymakers can do to support this process.



Evolving networks powering a new ecosystem



01

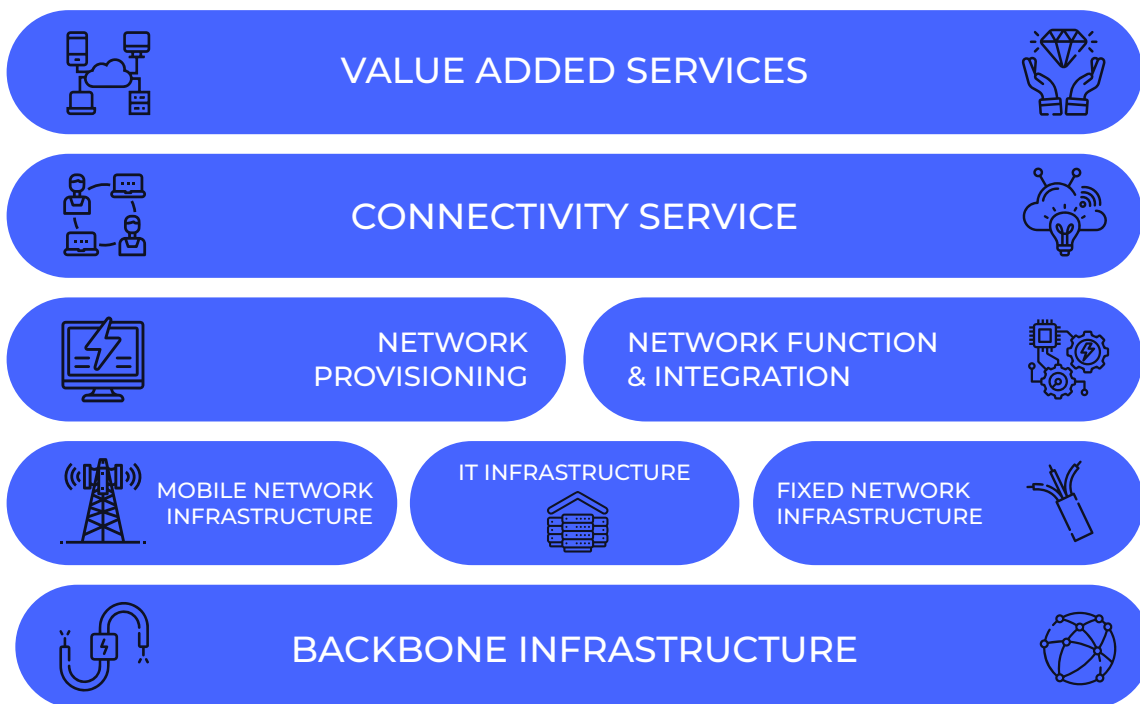
Fibre and 5G networks as well as other digital infrastructures serve one primary purpose: to provide European citizen and businesses access to digital services ranging from video streaming to e-government and from robotics to AI. Connectivity is an essential enabler of sustainable growth, the twin green-digital transition and the EU's economic security strategy.

Most European countries have not yet reached the full benefits of either fibre or 5G connectivity due to lagging availability and uptake. **Investment** in fibre and 5G network deployment remains a challenge, and networks need also continuous upgrading to keep pace with technological innovation and to strengthen resilience and

security. On the demand side, increased efforts to digitise European industry, public sector and SMEs as well as continued focus on digital skills are essential to boost uptake.

The telecom networks of today are being transformed to a **virtualized, software-defined and cloud-dependent infrastructure**. In the future, networks will increasingly depend on cloud computing, artificial intelligence, virtualization, and other technologies that, to date, are primarily 'Made in America' or 'Made in Asia'. In less than 10 years, the global ICT market share of the European industry has dropped by 10%.

Telecommunications ecosystem architecture



Source: Politecnico Milano, Osservatorio 5G & Beyond

The profound technological **transformation of the connectivity value chain** will have a significant and lasting impact on operational aspects and commercial models within the telecom industry. Policies and rules matter: they can be the deciding factor in either unleashing new opportunities for the economy and society or holding back the entire European connectivity ecosystem.



€114bn

required to achieve the fixed gigabit coverage goal

This includes €40bn in public funding

FTTH

All together, building full gigabit coverage for Europe is estimated to require some **€174bn** of investment



€33,5bn

full capabilities of 5G standalone to install additional stations and small cells

5G

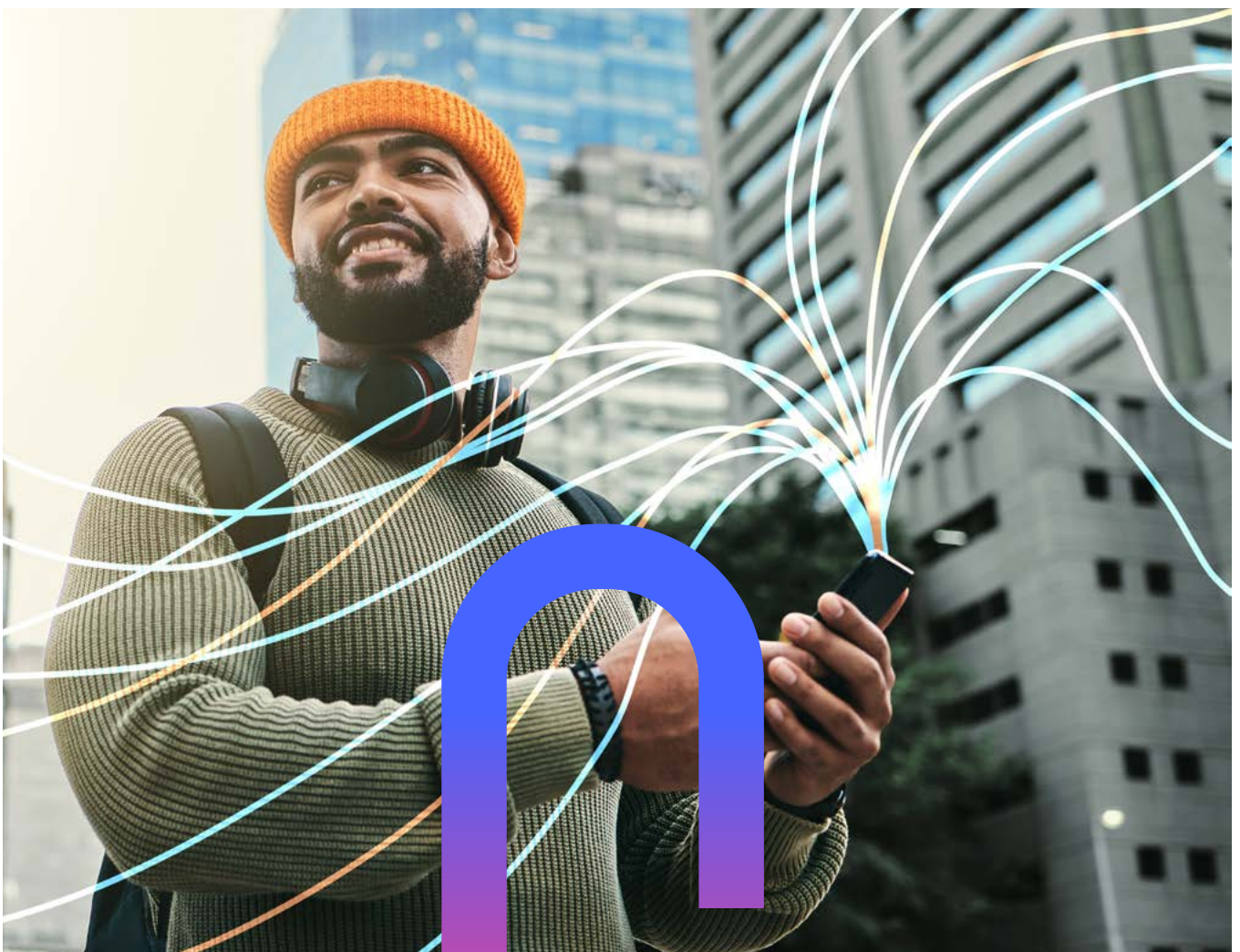


€26bn

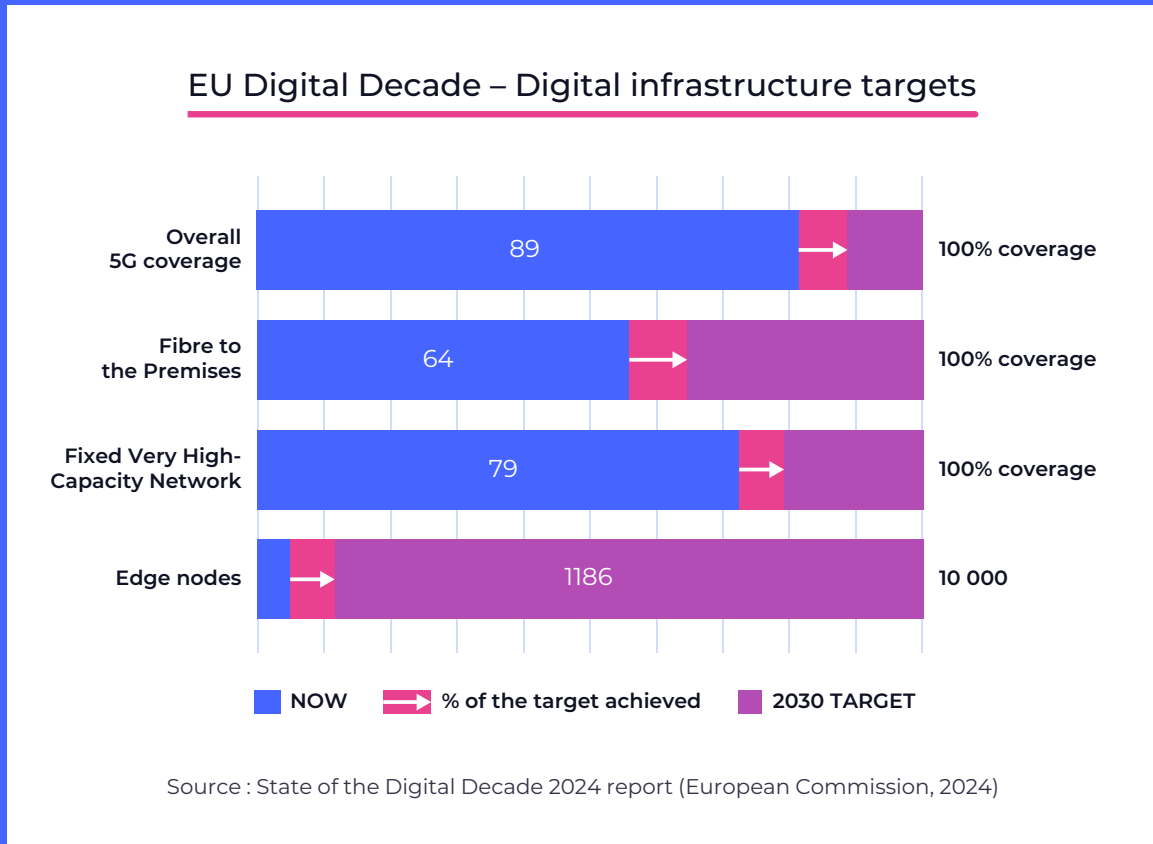
to ensure full coverage of transport paths (roads, railways, waterways)

**TRANSPORT
COVERAGE**

Source: Investment and funding needs for the Digital Decade connectivity targets (Wik Consult for the EU Commission)



POLICY FRAMEWORK



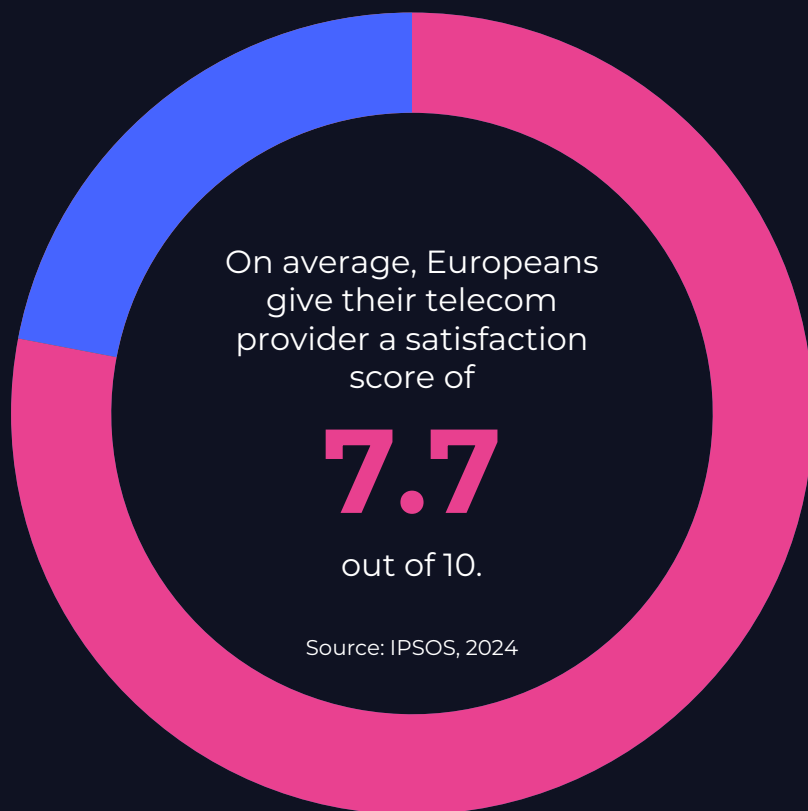
European digital single market: Advancing the European digital single market, where telecom operators and other contributors to the connectivity value chain benefit from scale and harmonised rules at European level, is a crucial step to create home-grown industrial success stories. European policymakers should promote policies, including competition rules, that foster sustainable market structures and allow telecom operators to become more attractive to private investment. Need for scale is widely endorsed by the different actors in the European connectivity ecosystem.

Regulatory reform: The future regulatory approach for the telecom sector must follow the transformational technological and market shifts and the current regulatory framework needs an urgent review. European telecom markets overall have high levels of competition, and the sector needs a leaner and more targeted set of rules. Furthermore, reducing the layers of overlapping and cumulative legislations at EU and national level is critically important. We must also establish fair and symmetric regulatory conditions for all actors in the connectivity ecosystem providing comparable services. management. Radio spectrum remains an essential resource to achieve full 5G for all and to pave the way for 6G. Only a pro-investment spectrum policy can support Europe's progress in this regard; more harmonized rules and greater predictability for operators are required.

Industrial policy: Europe needs an industrial policy that reinforces the competitiveness of its industrial sectors including Europe's converging connectivity and cloud ecosystem. A successful industrial policy should be built on open source and open technical standards and feature a toolbox with tailored funding and policy instruments. Policymakers should also ensure that competition policy remains aligned with European industrial policy.



Evolving services putting users at the centre



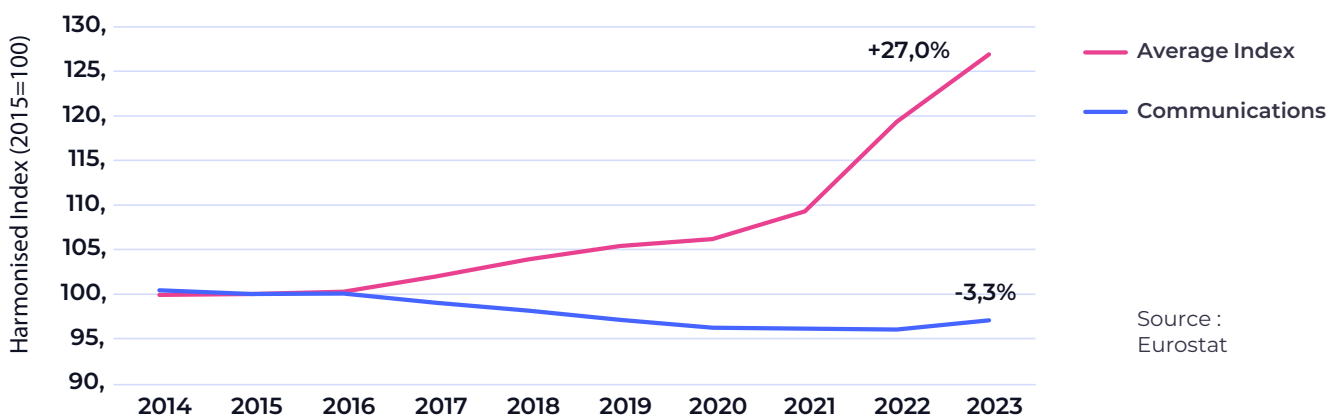
02

Traditional telecom services – voice, texting, connectivity – are staples for users, but the substitution of phone calls and SMS with online services and apps is unstoppable. Today, communication services span from traditional telecom providers to internet and cloud-based solutions like messaging apps, VoIP, video conferencing, and social media. New types of services and players are constantly emerging. The lines between telecoms and cloud or tech providers are becoming increasingly blurred in the eyes of end-users.

Connectivity is what users seek after from telecoms, as it is the gateway to all other digital services. Telecom operators view themselves providers of solutions that connect users with others and empower every aspect of their life. Users are at the heart of the connectivity business, and connectivity is at the heart of modern life, business, and society.

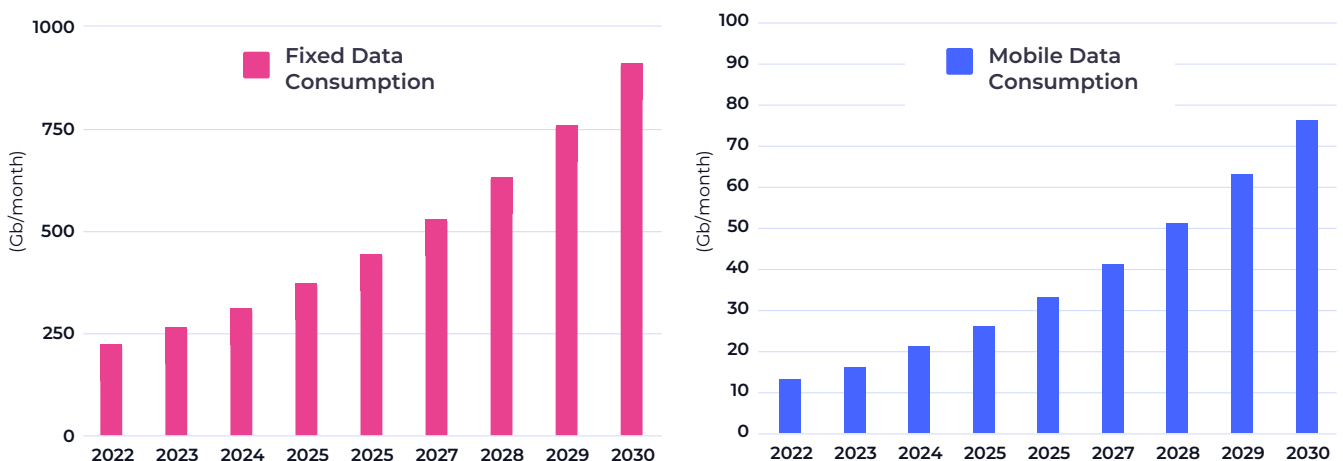
Telecom prices in Europe have consistently declined over the past two decades, unlike any other service industry.

Communications: evolution of consumer prices, 2014-2023



But users want more than affordable calls, texts, and internet. **Connectivity must evolve** to meet end-user habits and expectations. Data consumption over telecommunication networks has steadily grown across Europe and will continue to increase at an annual growth rate of 25% for mobile and 20% for fixed by 2030. Global data consumption will nearly triple from 2022 to 2027.

Fixed & Mobile data consumption forecast, 2022–2030 (GB/month)



Source: Evolution of Data Growth in Europe, A.D. Little (2023)

For consumers, data growth will be fueled by massive video consumption with ever-higher definition and device requirements. Video and gaming will increasingly integrate augmented reality, virtual reality, AI-generated content, and move towards 'metaversization'. **For businesses**, opportunities to seize innovation are offered by Digital Twins and the Internet of Things. Telecom operators can become a focal point of innovative ecosystems by providing solutions that integrate intelligent connectivity with software, cloud, system integration, and application programming interfaces (API). They

can enable everything from connected vehicles to telemedicine, industrial automation, and smart buildings.

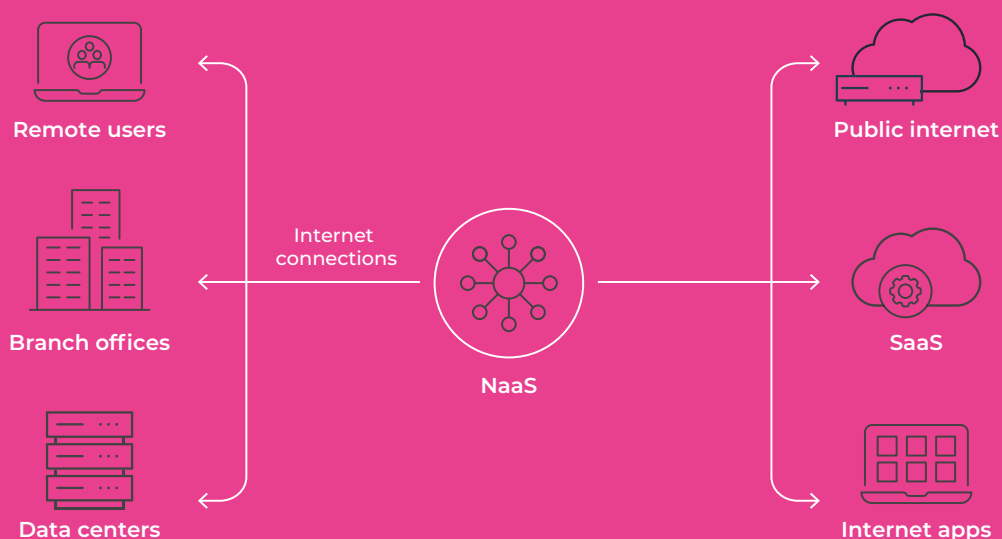
Not only connectivity must evolve, but the **whole telecom portfolio** is adapting to the increasing user requirements. Operators are offering more innovative propositions such as video, cloud, cybersecurity IoT, or financial services, depending on the specific customer needs. In areas of strategic importance, they can promote **Europe-made services**, by leveraging trust as a competitive differentiator.

NETWORK AS A SERVICE (NAAS), WHAT IT IS, AND USE CASES

Network as a Service (NaaS) is an emerging model that delivers network functionalities and capabilities as cloud-based solutions, accessible on demand. NaaS provides businesses, individual users, and organisations with a range of networking services, enabling them to manage their own virtual networks through software without incurring the costs associated with deploying, managing, and maintaining their own physical infrastructure.

The benefits of NaaS include cost-efficiency, flexibility, scalability, and enhanced security. By outsourcing network infrastructure to a NaaS provider, users can avoid the significant capital expenditures required for purchasing and maintaining hardware. NaaS also provides the flexibility to scale network resources up or down according to evolving requirements, and allows users to access the cloud-based network from any location and on any device. Additionally, NaaS can improve security by providing both networking and security services, such as firewalls, through a single provider.

Examples of NaaS use cases include real-time DDoS protection, which leverages built-in security features for continuous network monitoring and mitigation. Another use case is on-demand internet backup, which helps customers prevent disruptions from outages by enabling rapid bandwidth scaling.

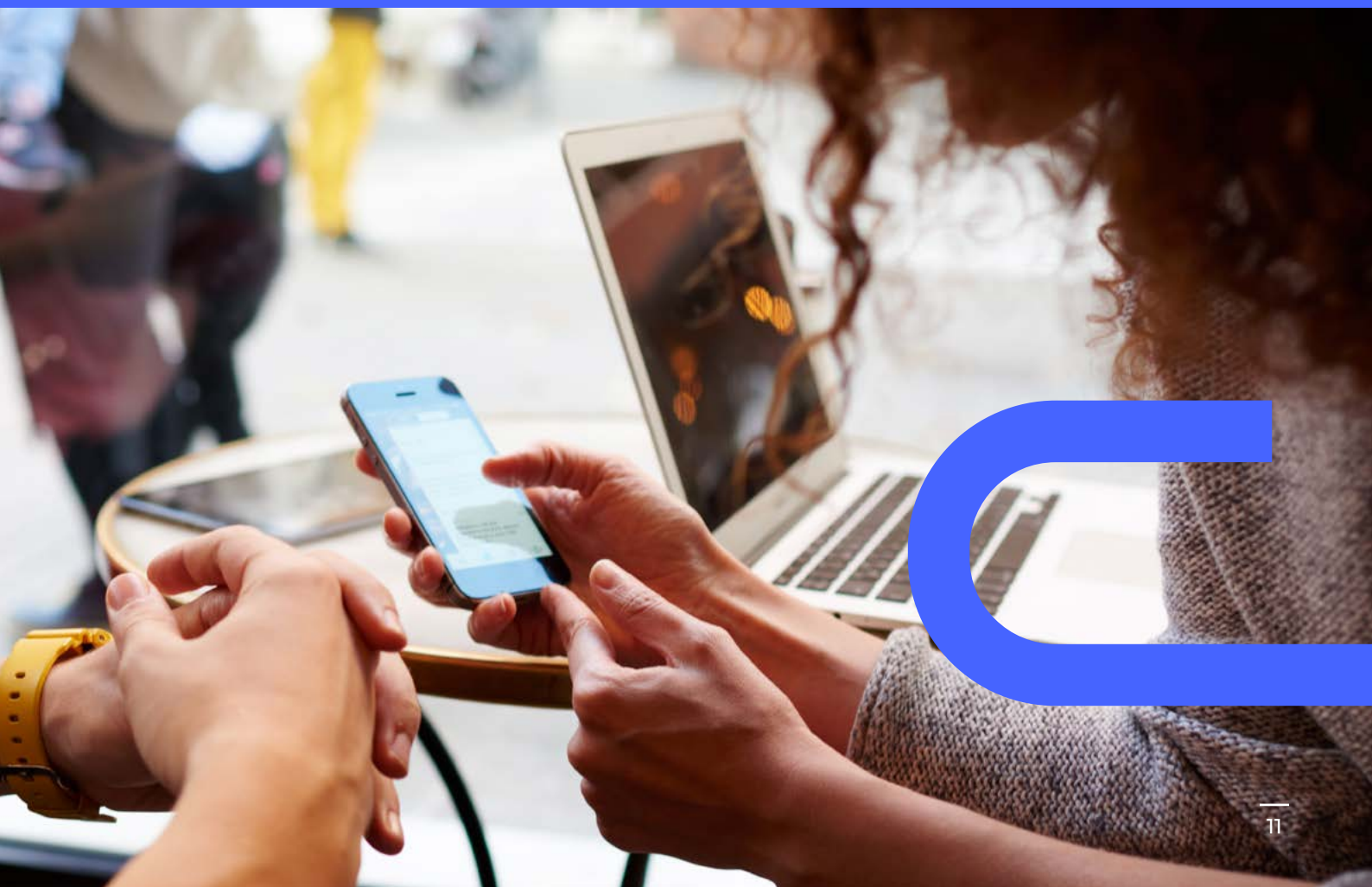


POLICY FRAMEWORK

Regulatory reform: The convergence of communication technologies and services requires a shift towards relying on horizontal legislation wherever feasible while removing past sectorial user protection rules that are no longer relevant in the current context. All actors within the connectivity ecosystem offering similar services should be subject to uniform rules. Furthermore, to enable innovative services leveraging technologies such as AI or network slicing, regulatory intervention should be limited to cases where there is a genuine harm to users. Finally, the regulatory and bargaining disparities in the internet value chain between telecom operators and large traffic generators should be addressed to tackle the continuous increase in data traffic.

European digital single market: Businesses offering services to consumers and consumers using those services should benefit from a harmonized level of consumer protection across Europe. This effort would also help level the playing field between nationally-based European telecom operators, hyperscalers, and international service providers, and facilitate the provision of cross-border communication services such as Network as a Service.

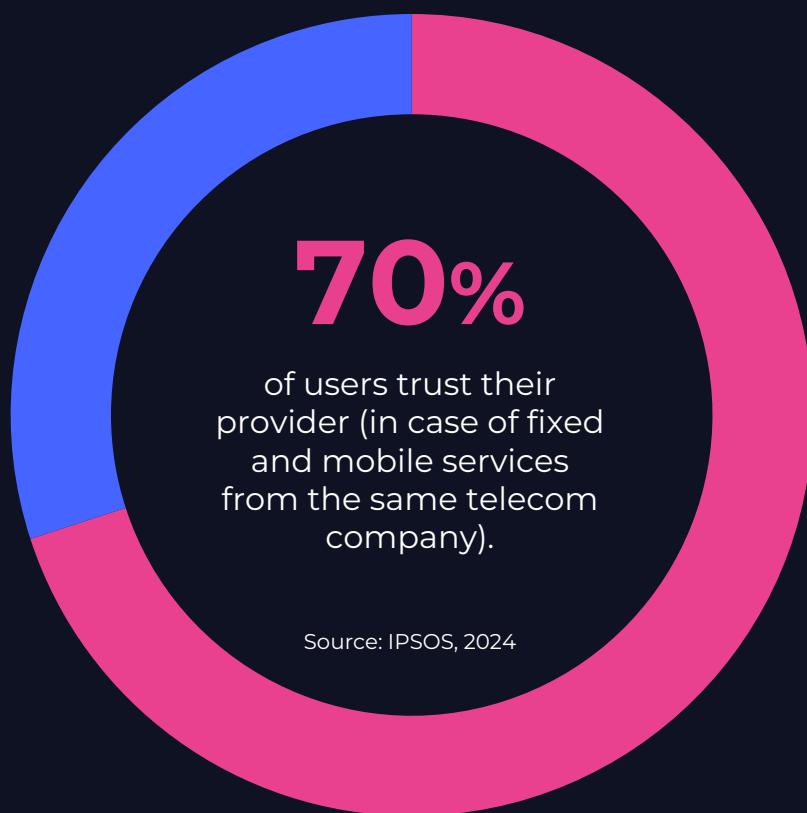
Industrial policy: In digital markets where global tech players hold a prominent position, achieving scalable results through cooperation is crucial for EU players to become competitive. Innovation in digital services requires robust collaboration among telecom operators and with other partners in the value chain, as no single player has the scale and reach necessary to succeed alone. Collaborative efforts that are strategic to the emergence of Europe-made services should be facilitated, reducing red tape, accelerating development, and delivering real impact for users.





Evolving society

advancing human capital, resilience, sustainability



03

Telecoms networks and services are not only essential for users to stay connected. Telecom operators contribute to the well-being of European society in several ways: through taxation, investing in skills, and making sustained capital investments in secure and sustainable infrastructure.

Despite the economic challenges and resulting job cuts over the past few years, telecom operators still employ over 1,3 million people in Europe. However, shifting demographics and changing skill demands in the telecoms industry due to automation, network and service evolution and cybersecurity are prompting a demand for **employees with new skillsets**. Telecom operators need to compete for IT skills against other industries in Europe which also grapple with a shortage of ICT specialists and STEM qualified workers. This scarcity poses obstacles to achieving the EU goal of employing 20 million ICT specialists by 2030. To address these challenges, several telecom operators are implementing innovative strategies.

In addition to addressing the skills gap, telecom operators are also embracing the integration of new technologies to create job opportunities, enhance skills, and foster career development among the workforce.

The **security** landscape has witnessed a growing diversity and volume of cyberattacks, with the ongoing conflict in Ukraine exacerbating an environment characterized by a surge in hacktivism and ransomware incidents. Telecom networks, being critical infrastructures and the gateway for essential industry and government services, bear a unique responsibility. Telecom

operators uphold a special duty to safeguard themselves and their customers from cyber threats. Ensuring a secure and resilient digital infrastructure is an essential component of cyber defence, with telecom operators serving as a “cyber shield” for other vital sectors of European society.

To **fight climate change**, the EU aims to be climate-neutral by 2050 with the objective to reduce its emissions by 55% by 2030 compared to the levels in 1990. The vast majority of telecom operators have committed to become net zero carbon companies already by 2040, and some by as early as 2030. To lead the transition to a sustainable digital future, telecom operators have taken decisive actions to transition to low-carbon, more resource-efficient and circular networks. As part of the solution to fight climate change, telecom operators also provide tailor-made solutions and services to help lower their customers’ greenhouse gas (GHG) emissions.

Large investments in **more efficient networks** and the decommissioning of legacy ones have resulted in increased resource and energy efficiency, allowing total energy consumption to remain stable despite the sharp increase in traffic volume. Success in reducing carbon footprint entails massive use of and investments in renewable resources and requires new measures to support circularity for devices and network equipment. However, despite energy efficiency gain, huge increase of data traffic and levels of carbon emissions upstream (around 80% of the emissions) are clear concerns that should be acted upon.



POLICY FRAMEWORK

Digital skills: We need an ambitious policy plan to support digital and cybersecurity skills across Europe. This should encompass all actors in the supply chain as well as users: from telecom companies re-skilling and upskilling their workforce to European players fighting for tech and AI talent, and to various categories of users including SMEs, civil servants, students as well as consumers.

Cybersecurity: As cyberattacks know no borders and threats to critical infrastructure can disrupt services across countries, there is a pressing need for closer coordination among agencies and operators across the EU and with likeminded countries to align threat mitigation strategies and enhance incident response capabilities. Enhancing operators' preparedness against the evolving cyber threat landscape also requires improved sharing of threat intelligence from public authorities. The coexistence of various European risk management and reporting obligations, alongside national security requirements risks hindering legal certainty and consistency and should be harmonized to the maximum possible extent. Finally, efforts to promote investments and to create a single market for telecoms should consider the costs of ensuring network security, including how certain aspects of resilience and preparedness for large-scale geopolitical events should be funded. Improving resilience and strategic autonomy also requires bolstering efforts in the submarine cable sector. Increasing funding and developing an EU strategy will contribute to this goal.

Sustainability policy: Europe should develop a bold climate transition plan together with its telecommunications industry. This requires evaluating the impact of any new measure on the sector's green goals before adoption. Thanks to the EU taxonomy, we have the right tool to direct financing to green activities: for this reason, connectivity networks should be explicitly included in the next review of the Climate Delegated Act. We should also support initiatives that reduce carbon emissions: facilitating commercially driven migration to full fibre and 5G, decommissioning of older and less efficient networks, improving access to renewable energy for the connectivity sector, promoting circularity for network equipment as well as voluntary network-sharing agreements. An equal commitment of the entire value chain to sustainable initiatives is vital and we should be fostering strengthened cooperation. Making networks greener and more efficient also means supporting investment in low-carbon networks, so that all citizens have the choice to access energy-efficient networks such as FTTH and 5G.

RECOMMENDATIONS

To promote a thriving European network ecosystem that puts users at the centre and maximized its positive societal impact, we need to:

- ▶ **Make Europe more competitive. Create a concrete plan to strengthen the European Digital Single Market**, including through in-market scale, voluntary industry cooperation as well as EU-level policy harmonization and a strong skills agenda. This will require revising relevant policy frameworks, including competition law.
- ▶ **Let the rules of the game be easier, clearer, fairer.** Remove unnecessary rules, streamline sectorial regulation, further harmonize the remaining sector-specific policies with horizontal rules in areas such as consumer protection, privacy, and security and ensure a level-playing field by applying the same rules for comparable services.
- ▶ **Provide gigabit access to all citizens and companies, faster.** Achieve increased network investment through a novel approach to access regulation that relies on general competition law by default, on existing symmetric regulation concerning access to passive infrastructure, and on targeted ex-ante obligations to tackle persistent local bottlenecks.
- ▶ **Create an investment-friendly approach to spectrum policy.** Review the European spectrum policy to support investment and boost 5G and lay the ground for future 6G innovation.
- ▶ **Promote fairness and correct current asymmetries in the internet value-chain** through a dispute resolution mechanism, including in the IP data transport market.
- ▶ **Give Europe an industrial strategy for secure connectivity.** Promote a strong European industrial policy that supports a competitive European telecom cloud infrastructure and a European ecosystem in strategic network technologies, such as Open RAN, by facilitating industry cooperation and making appropriate public funding available.
- ▶ **Streamline the various reporting obligations in areas such as cybersecurity, sustainability, etc.** without affecting the final reporting results by focusing on the most relevant data rather than the quantity of data – less is more.
- ▶ **Launch a bold climate transition plan for connectivity.** Support the European twin transition by promoting the deployment of next-generation infrastructures and initiatives that reduce carbon emissions, such as access to low-carbon energy, the circular economy, and operator-led network sharing. Include European telecom networks as a taxonomy-eligible economic activity in the next review of the Climate Delegated Act.



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