Connect Europe
ETNO becomes

OUR RESPONSE TO THE PUBLIC CONSULTATION ON THE EUROPEAN COMMISSION

WHITE PAPER "HOW TO MASTER EUROPE'S DIGITAL INFRASTRUCTURE NEEDS"?

Response to the public consultation on the European Commission white paper "How to Master Europe's digital infrastructure needs"?

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OUR TOP PRIORITIES FOR THE FUTURE OF CONNECTIVITY AND RELATED POLICIES

Europe is one of the most digitized economies and societies globally. European citizens and businesses are avid users of digital services, and in the coming years, demand for digital services is expected to continue growing steadily. Both end users and providers of digital content and services benefit from high quality connectivity across the continent delivered by telecom operators of different sizes and profiles. We need to collectively ensure that Europe stays on top of its digital game - this means safeguarding Europe's competitiveness and ensuring a path for continued prosperity for its citizens while delivering on the goals of the green transition.

In the past years, Europe has fallen behind the global pace of innovation and investment in the broader connectivity ecosystem. The coming years will be crucial for Europe's connectivity and for European citizens' access to high-quality and resilient digital services. The connectivity value chain – from international connectivity to local access networks – is going through a profound technological transformation, which has a significant and lasting impact on operational aspects and commercial models within the telecom industry.

In this context, rules matter and they can be the deciding factor in either unleashing new opportunities for the economy and society or holding back the entire European connectivity ecosystem: from telcos to vendors, from digital SMEs to a highly skilled workforce. We would like to highlight the following points as foundational pillars towards an updated policy framework for digital infrastructure and services.

OUR TOP PRIORITIES FOR THE FUTURE OF CONNECTIVITY AND RELATED POLICIES:

Purpose: Strengthen Europe's digital infrastructure to serve the needs of European citizens and businesses

Stronger together: Advance the European digital single market

Global competitiveness: Reinforce the European digital footprint

Better regulation: Commit to a leaner and simpler policy framing

PURPOSE: STRENGTHEN EUROPE'S DIGITAL INFRASTRUCTURE TO SERVE THE NEEDS OF EUROPEAN CITIZENS AND BUSINESSES

Fibre and 5G networks as well as cloud infrastructures serve one primary purpose: to provide European citizens and businesses access to digital services ranging from video streaming to e-government and from robotics to AI. While the majority of European end-users today can choose to use high-quality connectivity and innovative digital services, we still see persisting gaps related to infrastructure coverage especially in rural areas and to the level of digitisation amongst businesses and governments [1]. Individual citizens continue to stress the need for better and more resilient connectivity as well as for better protection of data to facilitate their daily use of digital services [2]. Furthermore, the 5G infrastructure necessary to drive B2B use cases that take advantage of the advanced capabilities of the technology is still largely missing in the EU, despite a large majority of European business owners considering 5G as important for the future of their business [3].

European policymakers have acknowledged the importance of digital infrastructures in the EU Digital Decade Policy Programme [4] by creating collective targets and a comprehensive roadmap for the key actors in the connectivity ecosystem. In parallel, the European Parliament, the Council and the Commission agreed on a joint Declaration on Digital Rights and Principles [5] putting people at the centre of the ongoing digital transformation and promoting European values as an integral part of the process.

As European telecom operators, we reaffirm our commitment to the Digital Decade programme as well as our endorsement for the declaration on Digital Rights and Principles. These policies should remain to be the common guiding light for all stakeholders, as we embark to modernise the EU policy approach to telecom and the wider connectivity value chain.

[1] 2023 Report on the state of the Digital Decade, European Commission, September 2023
[2] Special Eurobarometer 532 "The Digital Decade", March 2023
[3] IPSOS for ETNO, 5G awareness and needs in Europe, October 2020
[4] DECISION (EU) 2022/2481 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 14 December 2022 establishing the Digital Decade Policy Programme 2030
[5] European Declaration on Digital Rights and Principles for the Digital Decade 2023/C 23/01

STRONGER TOGETHER: ADVANCE THE EUROPEAN DIGITAL SINGLE MARKET

While efforts have been made to overcome obstacles to achieve a European digital single market, the European national markets remain fragmented in terms of market structures and of the rules applied to digital and telecom sectors. Promoting a true European 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. We welcome Enrico Letta's timely high-level report "Much more than a Market" and urge policymakers to prepare an action plan to urgently implement its recommendations.

Building on the ongoing progress towards a European digital single market, a coherent and comprehensive industrial policy strategy that recognises the role of connectivity in supporting sustainable growth, in the twin green-digital transition and in the EU's economic security strategy is imperative. We believe that the connectivity ecosystem is an essential enabler to address opportunities and concerns related to climate change and security; digital networks should be central in European strategies addressing these critical areas.

GLOBAL COMPETITIVENESS: REINFORCE THE EUROPEAN DIGITAL FOOTPRINT

While advances in technology and the evolution of the policy landscape have progressed rapidly, the global context and evolving geopolitics have shifted in at least equal measure. Today, the European connectivity ecosystem is directly impacted by global developments in technology, digital markets, and trade, including the slowdown of globalization and the challenge this poses to open markets. Moreover, global and regional crises such as the Covid pandemic or the war in Ukraine have demonstrated the essential role of connectivity for the European economy and society.

Stemming from the various economic and societal benefits of connectivity and digital services, digital infrastructure has become one of the building blocks contributing to Europe's global competitiveness. The EU share in the global ICT market has fallen by 10% between 2013 and 2022 [6].

European policymakers must now prioritize digital transformation and infrastructure in their broader reflection to improve the Union's competitiveness, and address the challenges faced by the European digital industry, including telecom operators.

European telecom operators – who build, manage and operate digital networks – directly contribute to Europe's economy and competitiveness as leading employers, taxpayers, investors, and innovators. We firmly believe that a more globally competitive Europe will positively impact end-users and their digital experience, through macroeconomic benefits and through high-quality and innovative digital services.

[6] EC Communication "Long-term competitiveness of the EU: looking beyond 2030" [COM(2023) 168]; Data by Statista: ICT global market share by country 2022.

BETTER REGULATION: COMMIT TO A LEANER AND SIMPLER POLICY FRAMING

Following the liberalization of the European telecommunication markets in the late 1990s, a regulatory framework was established to help introduce competition in these new markets. Since that time, the markets have changed fundamentally: copper-based state-owned network and service monopolies have been replaced by commercial operators, who compete with each other and with new, diverse connectivity service providers such as utilities, hyperscalers, wholesale-only companies, and municipalities.

The policy approach for the telecom sector must follow the transformational technological and market shifts and requires an urgent review – both of the regulatory and the competition rules. European telecom markets overall have high levels of competition and the sector needs a leaner and more targeted set of rules. Furthermore, we must establish fair and symmetric regulatory conditions for all actors in the connectivity ecosystem providing comparable services. Reducing the layers of overlapping and cumulative legislations at EU and national level is equally pressing. And finally, more efficient and effective enforcement is critically important, as divergent interpretations by Member States have significantly contributed to differing levels of connectivity and digitization in the EU.

OUR KEY POLICY RECOMMENDATIONS:

Pillar I: Creating the "3C Network"

- ***Support a European telecom cloud infrastructure,*** including through open-standards, harmonisation of security and data laws, infrastructure-focused IPCEI funding, and the establishment of new EC technical organisation.

- ***Strategic, policy and financial support for a European Open RAN ecosystem***, including dedicated funding for "trusted" EU Open Labs hosted by EU mobile network operators (MNOs) for validation and testing.

Pillar II: Completing the single market

- ***A concrete plan to achieve scale in the European Digital Single Market***, including through the achievement of in-market scale, voluntary industry cooperation as well as EU-level policy and regulatory harmonization. This should include aligning competition law with the objectives of a new industrial policy for telecoms, with a review of the EU Merger Regulation.

- ***A modern regulatory framework that acknowledges the new connectivity ecosystem***. Streamline sectorial regulation, remove unnecessary rules, and further harmonize the remaining sector-specific policies with horizontal rules at EU level as well as national level (e.g. consumer, spectrum, security, taxation). Ensure a level-playing field by applying the same rules for comparable services. Providing legal certainty through further guidance to unleash the full innovative potential of connectivity (especially on specialised services) is necessary.

- ***Promoting fairness in the internet ecosystem.*** The current asymmetries in the internet value-chain should be corrected, and targeted regulatory intervention through a dispute resolution mechanisms is needed to ensure that large CAPs adequately remunerate valuable IP data transport services provided by network operators.

- ***Achieving increased network investment through a novel approach to access regulation.*** It is time to develop a new access regulatory system that relies on ex-post intervention (general competition law) by default and on existing symmetric regulation concerning access to passive infrastructure (GIA). The recommendation on relevant markets should be repealed. Exceptionally, where persistent local access bottlenecks remain, service variety deficits for end-users should be resolved via targeted ex-ante obligations that may be applied locally, case-by-case, to any relevant company.

- ***A spectrum policy that boosts 5G and lays the ground for future 6G innovation.*** Ensure long term business certainty through predictable and long-term licenses. Support a pro-investment approach thanks to greater consistency of award processes including with clarity on best award practices and on spectrum prices and fees, and to a new EC notification process.

- ***Robust plan that supports the telecom sector's green transition goals.*** *The European Commission should include electronic communications networks (ECNs) as a taxonomy-eligible economic activity, with relevant technical screening criteria, in the next review of the Climate Delegated Act; promote the circular economy also for network equipment through the ICT value chain; and support operator-led network sharing and legacy network switch-off.*

Pillar III: Security and resilience

- ***Leverage the implementation of the new security framework for products and services*** to truly harmonize European and national security requirements across the single market. Close the regulatory gaps where needed, for instance, with respect to cybersecurity ratings.

- ***Support the development of a European quantum cryptography ecosystem***. Consider Quantum Key Distribution (QKD) and Post-Quantum Cryptography (PQC) as complementary and prioritize the development of an EU ecosystem for QKD to assert leadership in the global technological race on quantum technology.

- ***Develop a comprehensive subsea cable policy for the EU***. Support investment in Cable Projects of European Interest (CPEIs) through increased public funding, in cases of market failure, to build new cable routes, to enhance existing infrastructures, and to leverage the EU Global Gateway. A pragmatic EU-level collaboration system for submarine cables involving EU stakeholders should be established together with harmonisation for security requirements of manufacturing and operations.

Mastering the transition to the digital networks of the future – A future-proof approach and the right policy mix

II. Introduction

As we collectively work to promote digital opportunity for all in this fast-evolving European and global landscape, our policy approach to digital infrastructures requires a clear step change. European end-users and digital content and service providers desire performant, secure, resilient and energy efficient networks, enabling smart and connected solutions for all sectors of the economy and society. Therefore, we need a policy framework that not only promotes the rollout of these connectivity services by creating the right conditions for investment and innovation but also strengthens the competitiveness of the European digital ecosystem in the current global environment.

We welcome the European Commission (EC) white paper "how to master Europe's digital infrastructure needs?" (hereafter "the White Paper"), which sets a clear vision for the future of connectivity in Europe. We particularly appreciate the efforts to capture the complex technological, commercial and political dynamics that affect Europe's digital infrastructure ambitions and ultimately the European telecom industry and wider digital ecosystem. As also mentioned by the Letta Report, a timely and proper implementation of the vision outlined in the White Paper with concrete measures and reforms will be critical for the future of digital infrastructure in Europe.

This paper provides Connect Europe's comments on the different elements introduced in the EC White Paper and puts forward a series of recommendations to European policymakers on the policy programme for the new legislative cycle. We largely agree with the EC's analysis of the trends and challenges impacting the digital infrastructure sector in Europe (section 2 of the White Paper), and hence, focus our comments on the proposed policy solutions to the specific issues addressed. Our response is divided into three main pillars, loosely following the structure of the White Paper.

III. Pillar I: Creating the '3C Network'

The White Paper gives an important analysis of the evolution of electronic communication networks and the changes brought by the entry of new players in the market for digital infrastructure. It rightfully acknowledges the major transformation the telecommunications sector is currently undergoing and its significance for the wider economy. Having the right infrastructure in place is crucial to enable the next wave of data and AI-driven technologies and is a key determinant for the EU's long-term

competitiveness and economic security. A future Digital Networks Act (DNA) should therefore create the right regulatory environment that provides the appropriate incentives for investment for the implementation of the EU strategic vision and policy objectives, including the necessary governance structure: set out the strategic vision and objectives and, provide for an adequate budget.

More broadly, the EU needs a dedicated industrial policy strategy on digital infrastructure, similar to existing efforts on chips or cloud, with the following key objectives:

1. Establish a comprehensive and transparent EU industrial policy for connectivity, bringing together all relevant ecosystem players in order to incentivise investments in infrastructure and innovation, while taking into account the 'EU's overarching sustainability objectives. Consider the importance of scale and demand for EU tech solutions by including specific take-up targets for EU technology in public procurement guidelines (e.g. on cloud).
2. Identify the key strategic technology areas and services in which EU capacity needs to be increased (e.g. Open RAN, telco cloud, edge cloud, network APIs, artificial intelligence, sovereign cloud/edge services and quantum encryption).
3. Streamline and coordinate existing funding programs and initiatives around clearly articulated policy goals, confirm an adequate budget for EU funds (including for IPCEIs, CEF and other programmes) and make them more efficient and leaner (i.e. creating a 'one-stop-shop'), cutting red tape and accelerating approval processes.
4. Support resources for an effective and coherent standardisation strategy that ensures the timely development of high-quality standards and promotes Europe's place in standardisation.

Such an industrial policy approach should be streamlined across policy areas (e.g. funding, competition, spectrum, telecoms regulation) and should look at all relevant technology trends impacting the connectivity ecosystem in a holistic manner, setting out major technology priorities and identifying strategic challenges**.**

1) Technological and service innovation challenges

Infrastructure investment exerts a robust influence on economic growth. Studies show that the economic multiplier for public investment is significantly higher than other forms of public spending. It underscores the capacity of well-designed infrastructure projects to drive economic recovery and foster stability[7].

Investing in network transformation is not a choice, but a necessity. Surge of network traffic and data-driven use cases will drive the redesign of network operations: Worldwide mobile data traffic is estimated to grow threefold between the end of 2023 and end of 2029[8], and Europe's mobile data consumption per user will continue to grow at an annual rate of 25% between 2022 and

[7] Global Infrastructure Hub, The vital role of infrastructure in economic growth and development, 2021

[8] Ericsson Mobility Report, November 2023

2030; 20% for fixed traffic[9]. Similarly, a Credit Suisse report from 2022 predicts that "data usage could easily expand more than 20x during this decade"[10]. This is due to, among other things, a significant acceleration of AI-generated content, across use cases, the spread of immersive technologies (augmented reality/virtual reality) and a massive shift from standard definition (SD) video to high definition (HD).

The ability of the telecom sector to invest in cloud-native, programmable, and highly automated networks and innovative services will directly influence the EU's overall competitiveness. This is because state-of-the-art digital infrastructure is notably essential for powering a plethora of industrial use cases, thereby serving as a crucial resource for economic competitiveness. For instance, Analysys Mason emphasizes that "the right infrastructure will be a key determinant of how quickly the metaverse can progress."[11].

The investment necessary to deliver on these developments is high. 5G standalone will require a new, cloud-native 5G core, which will unlock new services and user experiences through network slicing; and standalone deployment is still relatively low. Investment requirements for technologies and services such as edge computing will vary depending on the specific rollout scenario. However, the investments that telecom operators can make in network transformation and innovative technologies are inherently limited due to the already existing investment gap in connectivity. Moreover, any potential investment still pales in comparison to the annual CAPEX allocated by hyperscalers, which totalled over $ 870 billion over the past 10 years[12].

Therefore, the significant financial pressure that European operators face reduces their ability to address investment needs in innovative network technologies. In addition, increasing uncertainty about future monetization opportunities and growing competition from hyperscalers and internet platforms pose risks of further value migration. The ability of the sector to deliver the Digital Decade targets and cope with all future investment needs for technologies, such as edge cloud, will depend on the financial health of the industry as a whole and on its ability to monetize new services in light of the existing investment gap.

The unpredictability of future take-up and the still limited number of mature use cases for technologies like edge computing currently raise questions on the development of viable business cases. This underscores the importance of public funding at the right time. In this current first phase of uncertain take-up, it would be desirable to entirely finance the identification and promotion of use cases that can demonstrate the tangible benefits of new technologies, thereby encouraging greater adoption, investment and ecosystem evolution.

2) 3C Network - Connected Collaborative Computing

A World Bank meta-analysis of infrastructure research since the 1980s in the transport, energy, and digital sectors underscores the pivotal role of well-planned infrastructure

[9] Arthur D. Little, "The evolution of data growth in Europe", 2023

[10] Credit Suisse Report, Metaverse: A Guide to the next internet (2022)

[11] Analysys Mason, Network requirements for the metaverse (2023).

[12] Data Gravity, "$150B+ of Annual CAPEX: The trends in Capital Expenditures by Hyperscaler Tech Giants", 2024

projects in job creation, productivity enhancement, and the promotion of economic growth. Modern infrastructure not only enhances connectivity and efficiency but also serves as a catalyst for fostering economic development, long-term prosperity, and stability[13]. This is why we support the creation of a telecom innovation community centred around the "Connected Collaborative Computing" (3C Network) ecosystem.

Creating this ecosystem will require, among other things, public-private initiatives within funding programs. In this regard, ETNO welcomes the Commission's readiness to reconsider the interplay and synergies that can be established between existing EU funding programs. It is important that the following premises are considered in the EC's and/or Member States' budgetary support:

Focus on technology rollout: the EU has traditionally been strong in technological research, but one of the primary challenges Europe faces is transitioning from research to market. Therefore, a future industrial policy approach on connectivity and digital infrastructure should not only look at R&D but also technology deployment on a large scale along with R&I to boost service innovation and ecosystem enablement and evolution (e.g. interoperable networks and services). This is particularly critical because many of the technologies in question require further support for commercialisation. The proposal for an infrastructure focused Important Project of Common European Interest (IPCEI) could help to provide the funds necessary for the large-scale deployment of advanced digital infrastructure. Going this last mile is crucial to preventing future dependence on foreign technologies.

Align competition with industrial policy: the rules for merger control need to facilitate sufficient scale for investment to enable the transformation of networks regarding security, innovation, sustainability and quality of services. Where this is not possible through private means, state aid shall be applicable to overcome market failures, which should be assessed in a flexible way according to circumstances.

Simplicity and speed are of the essence: it is necessary to simplify and accelerate existing industrial policy tools and funding frameworks. While projects like the IPCEI Cloud Infrastructure and Services (CIS) are significant, past experiences have demonstrated that administrative burden can delay the award procedures, resulting in European companies being late to meet demand. The IPCEI validation process should be accelerated and simplified to ensure that it remains relevant market wise for innovative products. To make a real difference in the roll-out of advanced digital infrastructure and support European companies in a meaningful way, a prospective IPCEI for infrastructure must be less bureaucratic, more streamlined, and efficient. Especially, the time from announcement of the programme to the notification of the funding decisions must be significantly shortened.

Need for better coordination: a significant challenge within the EU's approach to funding technological projects is the fragmentation and isolated nature of these endeavours. Despite receiving substantial support from the EC or the Member States, many projects have limited impact on

[13] World Bank, Economic development unlocked: a meta-analysis of infrastructure's impact, 2023.

broader industry or technological advancement.

It is essential that administrative burdens are significantly reduced, and permitting procedures to be accelerated at both EU and at national levels. To ensure coherence and alignment with strategic objectives, we would welcome the establishment of a proper governance structure, including a one-stop-shop to centralize the management of all funding opportunities on digital infrastructure such as IPCEIs, Multi-Country Projects, the Connecting Europe Facility, Horizon Europe, and Digital Europe programmes. Currently, we are missing a central body responsible for ensuring synergies and avoiding overlaps, leading to a landscape where projects – though individually successful in meeting specific objectives – collectively fail to contribute to a cohesive and impactful technological ecosystem. This situation underscores the need for a more integrated approach, where projects are not only interconnected but also aligned towards common strategic goals. This would ensure that EU investments translate into tangible advancements.

It is important to ensure that public funding does not crowd out private investments. In order to prevent disparities becoming too large, the EC should allocate a dedicated EU-wide budget, which can complement national budgets when implementing 3C Network projects. However, this should not impede the possibility for a group of Member States to go ahead with specific projects (e.g. in the framework of an IPCEI), in case there is a joint interest in promoting certain technologies. Additionally, aid schemes could incorporate tax and financial incentives aimed at attracting private investment in critical and emerging infrastructures. These could include R&D tax credits and investment allowances specifically tailored for critical infrastructure investments.

3) Telco Cloud and Edge Cloud

Telecom operators' investment in edge cloud is linked to the EU's target to deploy at least 10,000 climate neutral highly secure edge nodes across the Union by 2030. The common edge-to-cloud continuum pursued by the IPCEI CIS will be an important initial step in developing the technology necessary to boost edge developments and strengthen a European telco cloud and edge ecosystem. This means that currently planned deployments, e.g. in the framework of the IPCEI CIS already need to be designed and implemented in a climate-neutral way.

However, the IPCEI CIS development and approval process took three years to materialize; the projects have been designed and will be implemented at national level and only involve seven Member States. Moreover, the IPCEI CIS is primarily designed to encourage the initial take-up of edge cloud solutions, not to facilitate the commercial rollout of edge cloud infrastructures. Hence, it is neither enough to make up for the massive funding gap vis-à-vis hyperscale investments in cloud nor is it sufficient to attain a truly scalable and federated investment in edge cloud across Europe.

IPCEI CIS funding could therefore be enhanced with a new infrastructure-focused IPCEI that catalyses additional EU resources and focuses on adjacent technologies (e.g. including network cloudification, Open RAN). Under a potentially new IPCEI, the approval of projects should be expedited and implementation should be closely coordinated at EU level. The new IPCEI should support network cloudification and the development of telco cloud hardware

and software solutions that can act as enablers for high-capacity edge cloud critical solutions. Furthermore, innovation for telco functions and edge nodes should be enhanced, the deployment of nodes supported and the specialised service performance rationalised. To effectively complement these measures, there should be incentives to use innovative services (demand-side measures use telco edge cloud or specialized services from 5G) that will unlock a subsequent wave of investment.

It is important to note that major players in the cloud market can expand their influence into the traditional ECN supply chain. This is the case, for example, where cloud providers act as service providers to host network workloads on their infrastructure. In this context, the applicability of the Data Act is questioned. While the Data Act aims to facilitate cloud switching and interoperability, it remains unclear whether it will have any effective impact on telco cloud solutions, which are customized by design and therefore risk not being covered by the provisions (cfr. the exception for customized services in the Data Act).

By fostering open-source implementations and establishing a technical committee for project oversight, the EU can ensure that investments translate into cohesive, scalable solutions that stand competitive on a global scale. This strategic vision not only addresses current challenges but also lays the foundation for a future where the European telecoms sector leads in technological advancement, data sovereignty, and market competitiveness.

4) Open RAN and other technology priorities

The EC exploratory consultation on the future of connectivity (2023) identified five key technology trends for electronic communication networks:
- Network virtualization
- Artificial intelligence (AI)
- Open networks (incl. Open RAN, API, NaaS)
- Edge Cloud
- Low orbit satellite communications/ terahertz communications

In the summary report on the consultation, it is noted that “there seems to be a consensus among a significant number of respondents that open networks, the virtualization of network functions, and edge cloud are technological breakthroughs that will jointly have the largest impact in the coming years”[14]. The importance of these **technologies** has also been affirmed by a Deloitte study commissioned by ETNO in 2023[15]. In addition, recent technological developments have reinforced the importance of AI, specifically generative AI, as well as quantum computing and encryption.

Open RAN is a key technology trend that is missing from the White Paper. We believe that the 3C Network should make the development of an EU Open RAN ecosystem a key priority. Telecom operators are increasingly investing in Open RAN to diversify the RAN supply chain and innovation base, reduce risks of vendor lock-in, and simplify the route towards a virtualized RAN architecture. Furthermore, additional work is ongoing to improve power consumption performance thanks to

[14] Results of the exploratory consultation on the future of the electronic communications sector and its infrastructure, 2023.

[15] Future of Electronic Communication Networks in Europe, Fact-Pack, Deloitte, 2023.

increased technology maturity and the expansion of the ecosystem.

Open RAN presents Europe with an opportunity to maintain and strengthen its leadership in modern network technology, at a time when Asia and the United States (US) are investing heavily in alternative RAN suppliers. For Europe, it is thus of strategic importance not to fall behind in the development of this network architecture model, which is likely to capture a significant share of the total RAN market in the years to come.

To achieve Open RAN leadership in Europe, the European telecom industry should be brought together around a new flagship initiative supported through the establishment of a dedicated workstream under the 3C Network or a multi-country project on Open RAN including interested Member States, possibly in the context of a potentially new infrastructure IPCEI.

Additionally, funding for Open RAN testing, evaluation and R&D through open labs should be a priority. Developing a common Open RAN validation framework in Europe would allow both vendors and operators to benefit from a one-stop-shop system that is essential to support system integration of different components[16].

The increasing disaggregation and virtualization of networks, accelerated by the advance of Open RAN, also leads to greater complexity in network operations. System integration will become a key challenge and business opportunity, as a significant portion of future value generation is expected to stem from it. Since it will constitute an important control point in future network operations, it is necessary for network operators to cultivate the necessary skills to manage this integration internally. Network automation and the use of AI will be crucial in this regard and should be prioritized in any future technology roadmap at EU level.

Another technology area that deserves attention is the development of network APIs. Initiatives such as CAMARA and the GSMA's Open Gateway aim to expedite the development and adoption of global standards for network APIs. The objective is to provide standardized interfaces/APIs across as many telecom operators as possible. This approach enables advanced network functionalities and capabilities, such as specialized connectivity (e.g. ultra-low latency or Quality on Demand (QoD)), to be directly accessible to developers and customers, facilitating the emergence of new business models and use cases. The EC should support the implementation of these projects by providing legal certainty and clear guidance regarding the applicability of existing net neutrality and privacy rules.

Finally, there is still significant room for improvement with regards to leadership in technology standards, since Europe is lagging behind other regions in the provision of resources and dedicated agencies. Standardization has become key to leading new technology proposals, fostering innovation, reducing fragmentation due to different regional or national requirements, promoting scale-up and supporting the deployment of products across regions. Standards enable technology to work seamlessly and provide market conditions to enable smooth transactions. And while

[16] By way of reference, in 2023, the US administration launched the Public Wireless Supply Chain Innovation Fund, which invests $1.5 billion from the CHIPS and Science Act in the development of open and interoperable networks. In 2024, two major lab and certification projects have been awarded with grants from the fund.

international technology standards are still largely developed through collaboration between private companies or national standards bodies, we consider that the EU should strengthen its involvement and support relevant EU entities and stakeholders, to ensure a level playing field with other regions.

5) High-level recommendations pillar I

- [3C network]: Support open standards and open-source based solutions to promote a comprehensive and sovereign Telco Cloud infrastructure. Ensure harmonised implementation of EU security frameworks, including within Telco Cloud environments, and in alignment with EU data protection laws. Establish a technical organization within the EC to oversee, evaluate, and integrate the outcomes of funded projects, ensuring they contribute to a cohesive and competitive European digital ecosystem. Explore the creation of a new infrastructure-focused IPCEI, based on an accelerated and more efficient approval process.

- [Open RAN]: Strategic, policy and financial support for a coherent Open RAN approach in the EU addressing the end-to-end integration of different components – both on the hardware and software side, specifically for system integration, network automation and integration of AI and cloud. This would contribute to the establishment of a relevant EU ecosystem, also relying on existing vendors. As part of this, there should be an allocation of dedicated funding to trusted EU Open Labs (hosted by EU-based mobile network operators, MNOs) for the validation and testing certification of Open RAN system integration which will foster a strong and healthy European Open RAN ecosystem.

- [Standards]: Support EU involvement in international standardisation and normalisation processes and develop an effective and coherent standardisation strategy that ensures the timely development of high-quality standards.

IV. Pillar II: Completing the Digital Single Market

We share the EC's assessment that there is no single market for electronic communications networks and services (ECN/S). The current market fragmentation and divergent regulatory approaches negatively impact operators' ability to reach sufficient scale to invest and innovate in the networks of the future.

In this context, we welcome Enrico Letta's timely high-level report "Much more than a Market" and the overarching message on the need for "*a new single market for a larger world*". The report recognises the stunning lack of scale of European companies in comparison to their global competitors and its impact on the European economy and the competitiveness of different industrial sectors. It also highlights that the investments necessary for new technologies require a fundamental rethinking of the current approach to in-market scale. We also welcome Letta's recognition that "*a healthy and secure electronic communications sector is crucial for the green transition, innovation, and resilience of the Union*" and

that the current investment gap in gigabit connectivity is no longer acceptable.

We support the continued efforts towards a true European Single Market, including the telecom and digital sectors, and urge European policymakers to propose a practical action plan to agree on key milestones and achievable next steps. Increasing scale through national M&A, voluntary industry cooperation, and harmonising and streamlining legislation at EU-level should be prioritised. We believe that a future Digital Networks Act (DNA) will open an immediate opportunity to advance the single market vision.

Under this pillar two, we provide our views and recommendations on the different elements of the current EU regulatory and policy framework encompassed in the EC White Paper, also highlighting further issues that in our view should be added to the overall analysis.

1) Considerations for enabling scale in the EU single market

The White Paper rightly makes reference to the need for cross-border consolidation to achieve one single digital market in the future, as the EU currently has a very fragmented telecommunications sector. We would like to emphasise that cross-border consolidation can only be the consequence of achieving the Digital Single Market, which requires other measures as a first step. Improving conditions for scaling up should be a priority. It is a massive opportunity to strengthen the industry, improve competitiveness, and to unleash consumer benefits due to more efficient and higher investments in digital infrastructure. As a first step, this entails more in-market scale to ensure sustainable returns on capital employed and continued investment, especially in network infrastructure, i.e. for the continued rollout and network upgrades.

Furthermore, streamlining sectorial regulation, revising outdated and removing obsolete rules and harmonising the remaining sector-specific and horizontal laws at EU level as well as national legislation (e.g. consumer, spectrum, security, taxation) should be at the heart of the action plan.

A. The challenge of scale

The telecommunications industry has very high investment requirements, which is the reason for the increased need for scale. Further to this, geopolitical developments have resulted in an increased focus on cybersecurity, national security and digital fraud requiring significant additional resources and investments. Spreading these investments between too many operators may have an adverse effect on network roll-out and quality: *"the operation of mobile telecommunications networks features important sources of economies of scale, which introduces a potential wedge between industry-wide investment and industry performance. Even if total investment increases with the total number of firms, quality of service may decline as network resources are spread more thinly across firms"*[17]. It is urgent that the EC promotes policies that foster sustainable market structures that allow telecom operators to gain scale and become more attractive and catch private investment and continue

[17] Market Structure, Investment and Technical Efficiencies in Mobile Telecommunications" Elliott, Houngbonon, Ivaldi, Scott 2023

investing. The White Paper recognises various investment needs, i.e. for current and new technologies, network capacity, cybersecurity, fraud prevention, among others, which are necessary to meet the Digital Decade targets for gigabit connectivity and 5G roll-out. This investment can only be achieved by highly performant and financially sustainable EU operators able to attract more users to their networks, so that they can allocate funds for further investment. The only way to meet the significant costs for network upgrades and deployment is through increasing network utilization and achieving the associated economies of density. The need for a swift return on investment (RoI) is expected to increase with time due to the acceleration of innovation cycles.

In the same vein, the White Paper recognises that to attract private infrastructure investment, investors require clear business cases for profitability, which primarily depends on the take-up and scale at local level. The starting point for a business case can only be achieved by increasing the number of customers per network operator active at national level. Market structure initiatives such as M&A would allow telecom operators to reach in-market scale and become more sustainable, which is the prerequisite to enabling cross-border consolidation in the long-term, as it allows companies to increase their economies of scale and density necessary for further investment. In-market scale is vital to deliver critical, secure, new and sustainable world-class digital infrastructures for the benefit of society in the future. It is also crucial and positive for citizens and consumers, who will be able to enjoy high connection speeds and new generations of mobile networks at competitive prices. Analysis has shown that the few in-market mergers that have taken place in Europe have, in fact, led to quality improvements without any significant negative price effects[18]. This has been even more evident where remedies have not marginalised the efficiencies created by a merger. Additionally, it has also led to higher investments per operator and a more ambitious sustainability profile after the merger[19].

B. Short-midterm: Fostering national M&A initiatives will lead to economies of scale

Alongside regulatory market harmonisation, creating sustainable market structures at national level (i.e. by enabling M&A initiatives that bring more customers to a network) is paramount for telecom operators to facilitate scale and foster cross-border consolidation. It is important to note that the efficiencies of merger procedures are gained at local level though density and utilization. Currently, the biggest investments are required in the access network and relevant economies of scale are local rather than transnational, i.e. synergies are created by having more customers using each network's assets. Promoting cross-border consolidation is very difficult in the short and medium term, not only because of a lack of cross-border synergies, but also because of the regulatory fragmentation of the telecoms markets and its different characteristics (e.g. topography, population density, access to pipelines, etc). For this reason, and due to the current state of the sector, it is necessary that competition policy enables a sufficient degree of intra-market consolidation to

[18] "Do for-to-three mobile mergers harm consumers?" Compass Lexecon, 2023

[19] Evaluating market consolidation in mobile communications, Christos Genakos, Tommaso Valletti, Frank Verboven, 2018

facilitate the investments for future possible in-market scale. Additionally, further benefits have been proven with regards to quality of service and sustainability.

C. Cross-border consolidation only makes sense with one Digital Single Market

The White Paper refers to regulatory market fragmentation as the main obstacle to unlock incentives to foster cross-border consolidation and ensure a fully integrated Digital Single Market. However, while the EC does acknowledge the lack of competitiveness of EU telecom operators that hampers their ability to roll-out their networks and to meet the Digital Decade objectives, the proposed measures do not address the root causes of this situation.

The currently fragmented telecom markets in Europe do not allow noticeable synergies as a result of consolidation across EU borders. Without a true telecoms single market across Europe – together with enough scale at national level – there is no incentive for telecom operators for cross-border consolidation beyond centralizing business functions, such as common procurement. This is evident if we consider that even the EU players that are present in several countries deal with each business entity separately. Due to detailed and specific national requirements for operators, the EU regulatory framework has not provided unified conditions across national markets. Divergent enforcement of EU policy at national level and the imposition of national security requirements that prevent the integration of operations in different markets through the sharing of network functions, systems and resources add to the market fragmentation. Harmonising conditions through deregulation and simplification are necessary to reduce fragmentation and complexity of operating in different markets. Addressing these aspects is a prerequisite for a fully integrated EU telecoms single market, but this will still not be enough given the sector's financial constraints.

As correctly described in the White Paper, the value of the telecom sector has been decreasing over the last decade, forcing operators around Europe to start selling their assets (e.g. towercos, infracos). This trend has become visible through the number of operators that have had to divest their assets and exit national markets. Simply assuming that operators generally have, in the current situation, the financial strength to engage in cross-border consolidation does not correspond with market reality. Cross-border consolidation will only be achievable in the long term if pro-investment in-market structures allow a proper return on investments. European operators need to gain scale at national level. Operators achieve sufficient return on investment when there are enough customers over each deployed infrastructure, which would allow local efficiencies (e.g. optimised use of assets, spectrum and sites efficiencies, faster rollout of networks, and other out-of-market efficiencies like green footprint). In summary, the Europe needs strong, sustainable and profitable operators at national level to be able to consider cross-border consolidation and a true Single Market in the future.

D. Increasing Europe's industrial competitiveness

While a reinforced and well-functioning EU single market and a better regulatory framework are of utmost importance to the Union's economic and societal success, we also need a long-term vision for Europe's

industrial competitiveness in a global context.

The White Paper rightly says that the future policy framework for digital infrastructures should consider wider dimensions such as sustainability, investments, quality of products, industrial competitiveness, and economic security. Therefore, it appears evident that competition policy should be aligned to pursue these objectives as well, and this should be laid out in the fundamental regulations of competition law, such as the EU Merger Regulation (EUMR). From our viewpoint, it is time to evaluate the role of the EUMR framework, as it is one of few tools that has not been adapted to the challenges posed by digital evolution and globalization. The review of the EUMR is paramount to reflect the new market realities and challenges and to secure Europe´s competitiveness, resiliency and independency in the current geopolitical environment. Competition enforcement should take a more long-term and forward-looking perspective, as it can no longer afford to only look at short-term effects, underestimating the role of long-term effects in contributing to fulfilling the investment needs to ensure that the EU sector can be competitive, sustainable and secure on a global level.

E. Harmonisation of the EU policy framework

As indicated above, the removal of unnecessary regulation, further harmonization of any remaining sector-specific and horizontal rules, and streamlining national legislation – as far as they concern the telecom sector – are urgently needed. This applies to several policy areas, such as regulation of access, consumers, spectrum, and security. While we will discuss access, spectrum and security policy in more detail later in this document, we would like to highlight the need for a more harmonised and balanced approach in consumer policy.

To achieve a single market for consumers and alleviate the regulatory duplication of rules for businesses offering goods and services towards the consumer market, a balanced and harmonised level of consumer protection should be applicable across the EU. This means streamlining the regulatory framing and, very importantly, ensuring a fair and common level of protection for consumers. The ambition should be to replace sectorial consumer protection and apply EU horizontal consumer protection rules, which already make up one of the more comprehensive and detailed frameworks for end-users globally. In this regard, it should be highlighted that over-the-top (OTT) services are fully substitutable with mobile legacy voice and text services, hence service regulation should be subject to horizontal consumer protection harmonised across the EU.

The White Paper suggests lessening the administrative burden by bringing in potential rationalisation of reporting obligations of different actors. In general terms, it is missing a more ambitious proposal for simplifying the administrative burden of the European telecom industry regarding reporting obligations, but also concerning harmonization of security, integrity and lawful intercept obligations in the provision of the day-to-day telecom services. Administrative burden also arises from some sector specific consumer protection rules that impose a wide set of information requirements with questionable added value for consumers (providing large volumes of precontractual information, contract

summaries, national product information requirements, bundle regulation, etc).

2) Convergence and level playing field

Under the first pillar, we outlined our vision for the technological evolution of the connectivity ecosystem. Network virtualisation and convergence between network and cloud infrastructures will have a fundamental impact on many operational and commercial aspects of owning and managing digital infrastructures. The roles of the different players will become more blurred and be often closely interlinked in this new complex ecosystem.

The White Paper correctly recognises the asymmetries in the regulatory treatment of the "traditional" electronic and communication network and services (ECN/S) providers and cloud and other digital service providers. We would like to raise the following points regarding the ongoing convergence and the need to establish a level playing field amongst all relevant players in the new digital ecosystem.

A. Scope of application of the electronic communications regulatory framework

The converging connectivity ecosystem described above can be observed through various examples: internet-based messaging and voice services are replacing traditional telecom services; video streaming competes with linear television and IPTV-offers from telecom operators; and telecom operators are being dominated by hyperscalers and other non-telco players in the connectivity market[20]. Additionally, today a substantial 70 percent of global Internet traffic flows through the proprietary backbone networks of large content and application providers (CAPs), a stark contrast to the less than 10 percent observed prior to 2012[21]. The impacts of such an evolution require developing a more comprehensive approach of the digital sector, and ensuring a regulatory level playing field between traditional operators and non-traditional players.

We support the EC's intent to consider broadening the scope and objectives of the current regulatory framework. As part of this reflection, the focus should lie on developments in cloud, edge cloud and traffic delivery through national networks and their impact on the traditional telecom and adjacent markets. Different actors of the connectivity ecosystem providing comparable services should be subject to the same rules.

Specifically, we suggest the following considerations regarding levelling the playing field in the cloud market:

1. Establish a common framework allowing for the adequate provision of ECS, which could include measures such as, (i) aligning the reporting obligations for service offerings, (ii) guaranteeing compliance with certain conditions (quality of service and cybersecurity requirements) in the provision of the

[20] See Chapter 6. "Cloud and electronic communications interplay" in the BEREC Report on Cloud and Edge Cloud Computing Services: | BEREC (europa.eu)

[21] Analysis Mason, IP interconnection on the Internet, A European perspective for 2022, 2022, p. 23 based on TeleGeography 2022. TeleGeography, Content Providers Binge on Global Bandwidth, 2022, available at https://blog.telegeography.com/content-providers-binge-on-global-bandwidth

cloud services, and (iii) designating a competent authority to solve any disputes in an agile and efficient way.

2. Promote enhanced standardisation, interoperability and innovation to address standard cloud solutions (lock-in effects) and economic barriers resulting from the migration of data from one cloud provider to another. As a result, the applicability of the Data Act to customized telco cloud solutions needs to be enabled and the implementation of cloud workload portability, open standards and open-source solutions supported.

3. Ensure harmonised implementation of EU security frameworks within Telco Cloud environments in alignment with EU data protection laws.

Today's regulatory asymmetry hinders the competitiveness of the telecommunication market in Europe and needs be addressed. The fundamental element of this level-playing field should be an extension of scope to include all relevant actors in the digital connectivity ecosystem, based on a modernised, harmonised and uniform set of rules applicable to telecoms and other players providing substitute services.

B. Fairness in the internet value chain

The White Paper provides a brief overview of the current practices in IP interconnection and correctly highlights that the recent changes in the global architecture of the internet and of interconnection that have been mainly caused by the expansion of the proprietary content delivery infrastructures by the content and application providers (CAPs). The impact of this evolution of the internet value chain will be amplified in the coming years due to the ever-increasing levels of data traffic[22]. The latest data traffic forecasts project significant increases in data flows as a result of the commoditisation of different types of AI applications and services[23].

We welcome the recognition in the EC White Paper that "*commercial negotiations and agreements could possibly be further facilitated by providing for a specific timeline and by considering the possibility for requests for dispute resolution mechanisms, in case commercial agreements could not be found within a reasonable period of time*". However, we disagree with a number of other statements regarding IP interconnection in the White Paper, as well as with the general conclusion that the transit and peering markets are generally working well. Based on today's commercial reality, we do not agree with the assumption that all ISPs in Europe are able to recover the cost of the so-called "bill-and-keep" approach at retail level, as telecom operators suffer from low ARPU and ROCE which has also been acknowledged by the EC's analysis. Furthermore, the White Paper wrongly underlines the cooperative nature of the current interaction between CAPs and ISPs, and in fact, the present situation (the absence of a dispute resolution mechanism for fair negotiations) also contributes to increasing the imbalance in bargaining power between ECN/S providers and large CAPs. Finally, we do not believe that the number of disputes or interventions is an adequate measurement for analysing the functioning of a market.

[22] E.g. Arthur D. Little: The evolution of data growth in Europe, 2023

[23] Omdia: Road to 2030: AI and the Future of Network Services – Traffic Outlook and Implications, 2024

We agree, however, that due to the flattening of the internet, the interaction between large CAPs and ISPs has become closer, as most large CAPs now have a direct interconnection with ISPs around the world essentially bypassing the open internet. This commercial relationship is characterized by asymmetric bargaining power due to the global size of large CAPs, their strong presence in adjacent markets and asymmetric regulation. We support the view that in a free market economy commercial agreements should be reached based on commercial negotiations, however, due to the large asymmetries in bargaining power, there is ample evidence that such commercial negotiations are not taking place on equal footing. It is therefore not possible to restore a more balanced relationship without a binding dispute resolution mechanism.

The internet value chain is not balanced and several factors indicate that large CAPs have superior bargaining power, namely:

- Private peering is generally subject to charges. The reason why charges for IP data transport services are sometimes not levied is the fact that the amount of traffic in both directions is rather symmetric and respective payments would largely offset each other. This relationship is generally referred to as "settlement-free peering". Network operators are typically not inclined to provide IP data transport services on a settlement-free basis to a network with a significant traffic asymmetry, which is the case between large CAPs and ISPs. IP data transport is a valuable service, which can be charged, as already acknowledged by the Court in Germany in the case Deutsche Telekom against Meta[24].

- Large CAPs have become indispensable for ISPs, as they provide the content and applications that end users expect from any internet service and that play a key role in their everyday lives due to their strong network effects. The fact that large CAPs in most cases do not pay for this valuable IP data transport service and make use of their dominant position in their core revenue generating markets underlines the imbalance in the ecosystem.

- Large CAPs are less dependent on ISPs, as they have alternative options (routes) to reach their end users via other networks, such as commercial CDNs, cloud operators, or other carriers. These networks are interconnected to the ISPs' networks through existing peering and transit agreements, which enable the free flow of traffic between different networks in line with the Open Internet Regulation (OIR). Therefore, large CAPs do not need to obtain direct connectivity from a particular ISP to access its customers. A vertically integrated ISP must deliver any traffic that enters its network to end users on a non-discriminatory basis. As a result, even without a direct commercial agreement with a carrier, a CAP is still able to reach its end users via indirect connections and/or CDNs and/or cloud operators.

[24] https://www.telekom.com/en/company/management-unplugged/details/meta-must-pay-for-the-use-of-the-networks-1066682

- Large CAPs have a significant quality lever over ISPs, as they can influence the quality of service and network stability of ISPs by their own routing decisions. Large CAPs, which send particularly large volumes of data, can congest specific interconnection points by spontaneously re-routing a portion of their traffic via indirect connections to the ISP's network, thereby affecting the quality of service for all online services routed via the affected interconnects. This can induce a quality-adjusted price increase for end users on the ISP's network, which would deteriorate the ISP's competitive position if the CAP leaves connections to other ISPs unaffected.

- Large CAPs can impact the quality of services of a network carrier with an integrated ISP business towards its end customers, which is a central dimension of competition at retail level, and evidence shows that in case of any connection problem, end users react negatively towards their ISP and not the CAP. This effect is exacerbated by the fact that certain CAPs display to internet users ISPs ranking according to the quality level of the provision of their own service(s) with respect to CAPs' chosen criterion, effectively steering end-users to their preferred ISP. This is thus a powerful mechanism that can be used in negotiation between large CAPs and ISPs.

We believe that the current regulatory asymmetries in the internet value-chain should be urgently corrected. This would not only restore balanced bargaining power between the parties but also incentivise all key players use network resources efficiently. We therefore support the EC's proposal envisaging a dispute resolution mechanism between ISPs and CAPs in cases where commercial negotiations fail. We call for targeted regulatory action from the European Commission to establish such a dispute resolution mechanism that would ensure that large CAPs pay a fair and adequate price to ISPs for a valuable IP data transport services as a driver for their online business models.

3) Ensuring a European telco innovative services framework

A. Guidance on Open internet principles

ETNO and its members reiterate their commitment to ensure the internet remains open for all end-users, enabling them to access and share legal content of their choosing without any restrictions.

At the same time, due to massive changes in market dynamics and the interaction between different players the development of the digital ecosystem is in a critical phase. As the ecosystem matures, this is particularly true for 5G services: it will be essential for ISPs to launch innovative services based on technologies such as network slicing to fully valorise the investments in the 5G networks. While BEREC has issued an opinion on 5G slicing and its compatibility with the OIR[25], the BEREC analysis is largely limited to some

[25] BEREC Opinion for the evaluation of the application of Regulation (EU) 2015/2120 and the BEREC Net Neutrality Guidelines (BoR (18) 244)

technical points, omitting the larger policy debate underpinning this matter.

In our view, this will require legal guidance through a new European Commission Recommendation – without reopening the OIR – to unleash the full innovative potential of connectivity and ultimately to provide significant benefits for consumers and businesses. A more future-proof approach on how the OIR will be applied to nascent use cases, is required to create a stable regulatory environment. This will allow the development of concrete use cases based on 5G network slicing, and in the mid-term, the implementation of standardised APIs and the 'Network As A Service' vision further justifying future investments in 5G networks. Regarding 5G network slicing, it is also important to highlight that the enabled services will require further optimisation and specific treatment. Guarantees to the capacity and quality of internet access are essential for safety and mission critical use cases.

In addition, the regulatory asymmetry between ISPs and digital players in the context of the OIR, and more specifically regarding its provisions on traffic management, needs to be addressed to create a level playing field. Currently, the net neutrality principles that apply to ISPs do not apply to digital players, while these companies have the means to influence quality of service, as described above. The current regulation grants large CAPs the same protective rules as to other end-users, notwithstanding the fact that their position in the market is very different. It raises concerns, for example, in terms of device neutrality and the position that these digital players could acquire in the 5G ecosystem.
This is why the EC should consider the applicability of these key principles for the different players across the internet ecosystem.

B. Repeal of the E-Privacy

Another regulation that has become outdated and limits the creation of innovative European digital services is the current e-Privacy Directive, including the proposed regulation to modify the e-privacy framework.

The e-Privacy framework applies sector specific rules to telco operators which are extremely restrictive regarding data management and have become out of touch with developments of the data economy and corresponding new legislation. This hampers the ability of European operators to innovate and contribute to the evolution of the data economy. It is also to the detriment of consumers, because it limits the deployment of tools to fight fraud. With the level playing field principle in mind, and the rapid transformation of the digital ecosystem, all digital players should be subjected to the same horizontal rules on privacy, governed by the GDPR, as they often process the same kind of data (e.g. localization data).

The e-Privacy Directive should be repealed and the proposal for a Regulation should be withdrawn, as the lengthy negotiation process and changed market conditions have rendered it obsolete. Remaining aspects (e.g. confidentiality of communication) should be integrated into the GDPR through a targeted amendment and apply to all actors in the electronic communication ecosystem. That said, ETNO would like to underline the continued commitment of the sector to adhere to the confidentiality of communications.

4) Authorisation

To achieve the Digital Single Market, ETNO supports efforts to explore ways to harmonise rules and to create a policy framework enabling European companies to benefit from scale across the Union. However, while the country of origin has been favourable – for instance, to Video-on-Demand services as an information society service under the Audiovisual Media Services Directive – the benefits of the application of this principle to the EU telecommunications operators are not as straightforward.

As a preliminary assessment, the benefits of the introduction of a new 'country of origin' authorisation for 5G standalone core networks for those operators that already operate fix and mobile networks under current national general authorisations are limited, especially considering the current fragmentation of security, integrity and lawful interception requirements. There are obligations related to network provision stemming from national regulations which are normally not covered by the general authorisation but by other rules, for example, those related to national autonomy or lawful interception. As a result, operators providing networks even under the 'country of origin' authorisation regime will still be constrained in their ability to scale up network provision unless there is a significant effort to remove additional regulatory barriers through the simplification and harmonisation of substantive telecom regulation at EU level and allowing operators to share network functions and systems across European borders. The White Paper rightly identifies this problem and suggests closer cooperation between Member States through setting common security conditions to ensure operators can develop core networks across borders.

Without the adoption of these additional steps, the proposed 'country of origin' principle will not provide any benefit to EU telecom operators.

ETNO recommends that the EC addresses harmonization, simplification and in-market consolidation with a focus on the European telecom operators' needs.

5) Core network centralisation

As far as the cross-border consolidation concept of the EC relates to the centralisation of core networks, ETNO would like to highlight numerous obstacles. Core networks consist not only of backbone fibre network elements including the central routers, but also of network and policy control and service configuration platforms, as well as service platforms, e.g., to provide voice services. Core networks are frequently subject to strict regulation regarding public safety and security as well as critical infrastructure protection linked to national security.

A framework enabling cross-border core networks can be expected to be much more difficult to achieve for internet services, because they, in practice, face significantly more obstacles to consolidate and provide across borders.

Examples include information sharing restrictions where detailed information is often classified, which impedes early exploration and analysis of potential cross-border settings. Critical Infrastructure protection in many aspects is currently interpreted as "national network autonomy", by definition denying the handover of any components to another EU foreign country. It is technically easy to pass intercepted data to the defined handover by using lawful

interception. However, the surveillance measure including the list of targeted addresses frequently is classified information which must be kept secret and remain within the country. Similarly, security approvals of key personnel in critical infrastructures are currently based on national screening procedures which partially require residency within the country for a defined period (e.g., 5 years) which in turn renders cross-border settings practically impossible. Conflicting extraterritorial impact of national regulations may lead to conflicts that prevent the possibility of running services cross-border such as the right to conduct on-site inspections and assessments by tightly defined national supervising authorities. This immediately excludes similar activities by foreign authorities and in turn constitutes a de facto requirement to host the systems and services domestically. Similar effects can be observed from restrictions on remote administration and operations of network components.

Finally, certain customers and industries with increased data security and protection requirements may have to comply with further regulations, and it is therefore possible that the systems, traffic, billing, identity, and location data of their telecommunications usage are obliged to be kept within the country. While this does not exclude the provision of cross-border services by telecommunication operator in general, the need to run "national routing" systems for large customer groups renders the provision of cross-border services uneconomical when a fully domestic network has to be kept in place anyway to serve all the customers in a given country.

Overall, the concept of core network centralisation as currently envisaged in the White Paper cannot be considered feasible as there is a wide range of conditions, mainly at national level, that the EC would need support to substantially improve the European internal telecommunications market. Focus should therefore be given to driving deregulation and harmonization at EU level, and encouraging cooperation by Member States to address national rules that currently hamper the sharing of network functions and systems across borders.

6) Spectrum policy

The generally acknowledged digital infrastructure investment needs[26] represent a major challenge for the rapid evolution of 5G in Europe and risk putting the achievement of the Digital Decade targets at risk. In 2023, about 80% of Europe's population were covered by 5G networks and 10 out of the 114 operational 5G networks in Europe were 5G standalone[27].

Today, costs linked to spectrum licensing and management significantly weaken operators' ability to invest in digital infrastructure. European operators have spent more than EUR 26 billion in auctions in Europe for 5G bands and are expected to spend EUR 2.7 billion more[28], in addition to the administrative charges imposed by national authorities for spectrum management. Only a strong telecom sector supported by a pro-investment spectrum policy will be able to deliver a strong and sustainable economic growth and achieve full 5G for all. The next step is to urgently reform the European spectrum policy to address current challenges.

[26] See in part xxx of the future position
[27] Ibid.
[28] State of Digital Communications, ETNO, January 2024.

The White Paper recognizes many of the challenges, and the initial proposals are a positive trigger for discussion on more concrete actions for EU spectrum policy reform. ETNO welcomes wider adoption of best practices through clearly defined rules but has concerns about possible centralized EU-level award processes and the proposed strong coordination on award timing, as they may not allow for taking the specific national market demands sufficiently into account. ETNO has identified the following elements as our priorities to improve investment conditions:

- **Licence prolongation** – support long-term business certainty and alignment with investors' timeframes through extended license periods/indefinite licenses and early review of renewals in EU (see title 1.1).

- **Spectrum availability** – establish a clear roadmap for timely availability of additional harmonised mobile spectrum bands across low and mid bands to accommodate future mobile traffic demands of society in an energy and cost-effective way. Ensure that suitable harmonized spectrum is made available and can be used from the time of assignment (see title 1.2).

- **Ensure proper awards procedures and efficient assignment of available spectrum for public mobile networks** – introduce requirements for a careful socio-economic cost-benefit analysis before implementing provisions such as spectrum set-asides (e.g. for local or governmental uses, or newcomers), spectrum remedies in merger processes, or license-related obligations. Such requirements for analyses should apply at national level, but also at EU-level to support spectrum harmonization decisions (see title 2.).

- **Minimise the spectrum cost burden** – avoid inflating mobile spectrum prices through appropriate mechanisms to reflect opportunity cost, fair and transparent bidding processes that prevent price driving and support infrastructure investments, increased transparency to the collection of annual fees, and avoiding monopoly rents accruing to the Public Treasury (see title 2)

In addition to the abovementioned priorities explained in detail in the following parts, ETNO would like to also comment on the European Commission's proposal for the governance of spectrum management (see title 4. Governance structure).

A. Ensuring long term business certainty

1.1 Prolongation of existing licences

The White Paper suggests exploring the possibility for operators of EU core networks and pluri-national operators to request competent authorities to seek better aligned national authorisation processes and conditions for existing spectrum usage rights or general authorisations in order for them to operate in a more harmonised environment across borders**.** Given that there may be many pluri-national operators per country, but operating in different set of countries, this proposal might trigger discriminatory situations for some of those operators, and also to single-country operators. Additional clarity on the proposal, the role of the European Commission and the positive effect

this proposal would have on the current framework and investment environment, would be welcome.

License renewals through re-auctions create a high risk for market disturbances and high prices for spectrum resources that are already deployed to serve the societal demands. One of the best approaches to support investment is long-term predictability for spectrum licences through early and consistent decisions on prolongations of licences, or through indefinite licenses. This aligns better with investors' time horizons, supports ongoing network evolution, and possibly improves reported EBIT and ROCE, by amortising licence costs over a longer period. Reasonable annual fees after the first license term should be favoured and past spectrum prices should not be used as a reference for setting future annual fees[29].

As already stated in the past[30], the assessment of renewals of licences long before the expiration of the licence term has proven to be successful in several countries[31] [32]. This measure is easy to implement and would have an immediate positive impact on the investment environment of the sector. Therefore, we urge the European Commission to mandate Member States to assess the renewal of licences, including assessment to prolong and/or switch to a regime of indefinite licenses, as soon as possible or at least five years before the licence expiry date. We also call policy makers to consider relying on a principle of tacit renewal, i.e. renewing the license under the same terms and conditions as the initial license, if certain conditions are met (e.g. effective use of the licensed spectrum, and existence of customer base).

1.2. Spectrum roadmap ensuring spectrum availability and efficient use

The EC rightly acknowledges the importance of sufficient spectrum resources. As already mentioned in previous positions[33], to ensure Europe keeps up with the global 5G pacesetters and data demand increase, European policymakers must provide mobile operators with the means to enable both consistent 5G user speeds at the edges of their networks and sufficient capacity to support 5G in densely populated areas. This will remain true also for future technology generations (6G and beyond). To address the growing demand for mobile broadband in a financially and environmentally sustainable manner, ETNO supports a clear roadmap on future IMT spectrum availability. Such roadmap should include the upper 6 GHz, the 470-694 MHz bands, as well as an assessment of the 3.8-4.2 GHz band use[34]. The roadmap should also consider demands, possibilities and approaches for other bands, i.e. the bands studied for WRC-27[35]. We would welcome the publication of a draft roadmap by 2025.

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[29] The European Commission should consider best practice examples for spectrum prolongation and indefinite licenses, for example from Spain, United Kingdom, and Estonia.

[30] 'European Spectrum Policy for the Digital Decade – options for the new Radio spectrum policy programme', ETNO-GSMA position paper, 2023.

[31] In 2010, the UK switched to a regime of indefinite licences for changing the 900, 1800 and 2100 MHz license terms, with annual fees applying after the initial 20 years term.

[32] Spain introduced the possibility for licensees to ask for a 10-year extension of all existing licences, up to a maximum of 40 years total duration in the latest Telecoms law.

[33] European Spectrum Policy for the Digital Decade – options for the new Radio spectrum policy programme', ETNO-GSMA position paper, 2023.

[34] The 3.8-4.2 GHz band is being harmonized for local networks.

[35] 4400-4800 MHz, 7125-7250 MHz, 7750-8400 MHz, 14.8-15.35 GHz

ETNO appreciates the EC's intention to establish an EU spectrum roadmap towards 6G. However, enshrining such a roadmap into law should be clarified, as national market demand varies from one country to another, and thus strict EU-level timelines should be avoided. ETNO would like to stress the importance of technology neutrality as operators deploy and refarm spectrum bands according to their markets' demand.

In addition, the EC acknowledges that spectrum efficiency should be enhanced. This could be achieved in different ways. First, when taking spectrum harmonisation decisions at EU-level, a socio-economic cost-benefit analysis is needed. Currently, this analysis is urgent to support the harmonization work of upper 6 GHz, and 3.8-4.2 GHz bands, and the development of a strategy for the sub-700 MHz band. Such analysis should also be required before possible national decisions for setting aside mobile spectrum for local or dedicated uses, or for newcomers.

The 'use-it-or-lose-it' principle is rightly identified by the European Commission as a way to ensure efficient spectrum use. Accordingly, this principles and other measures such as annual incentive fees, should apply equally for all spectrum users, not just mobile operators.

Concerning spectrum sharing between different types of radio services or applications, e.g. between IMT technology and unlicensed RLAN technology as a means to enhancing spectrum efficiency, ETNO emphasizes that in addition to being technically feasible, it should also be commercially viable. Spectrum sharing does not support efficient use of spectrum if it decreases possibilities to deliver needed services efficiently and with realistic investments in deployment and operation[36].

The suggestion for a coordinated release and refarming of spectrum, for example, in the context of the 2G and 3G switch-off, stands in contrast to the efficiency principle. 2G and 3G network switch-off is well underway in Europe, many mobile operators have already set switch-off timelines and spectrum is being re-farmed for the roll-out of 5G networks and services to benefit society as a whole. In this regard, refarming of spectrum contributes to improve spectrum efficiency, to reduce the power consumption as well as to enhance the security of newer mobile network generations[37]. It is essential that operators can dispose of the spectrum that has been released to support the deployment of new and more efficient technologies. Therefore, altering the rules on how spectrum can be used and obliging continuation of 2G or 3G technology retroactively, "to continue support for legacy services", should be discarded and left to the discretion of the operator. To the contrary, a

[36] For example, sharing approaches between technologies generally impose power limitations or other constraints, or require complex sharing methods that increase development costs and create ecosystem fragmentation. As a result, sharing can lead not only to an increased risk of interference, but also to higher costs and a degradation of service quality and reliability of each individual service, and thus potentially to a reduction in the overall value of the spectrum.

[37] When it comes to 5G, this technology has proved to be up to 90% more efficient than 4G in terms of energy consumption per unit of traffic (W/Mbps). Furthermore, telecom operators are also increasingly using big data and AI applications in 5G to optimise the system's performance to make networks as sustainable and cost-efficient as possible. – Nokia, https://www.nokia.com/thought-leadership/articles/zero-emissions/#:~:text=For%20example%2C%20a%20recent%20study,clearly%20translates%20to%20cost%20savings.

swift migration from legacy 2G and 3G networks to more efficient technologies should be supported. However, a decision to switch off should remain in the hands of operators to allow an efficient use of such a strategic asset.

Spectrum is an essential resource for operators to provide mobile connectivity and plays a key role in the twin transition[38]. First, increasing the amount of spectrum frequencies per site is a more energy efficient way to increase capacity than increasing the number of sites. Second, the large consecutive spectrum blocks improve spectrum efficiency and network performance, because less spectrum is spent to guard bands to prevent interference, and the complexity to aggregate fragmented spectrum blocks to support higher data speeds decreases. Fragmented spectrum holdings, on the other hand, may lead to need to deploy additional base stations to provide the same capacity. By choosing to prevent artificial spectrum scarcity and avoid spectrum fragmentation, policymakers can allow for the provision of the needed capacity increase without intense densification of mobile network site grid, resulting in significant energy and material savings.

In addition, unjustified deployment limitations, e.g. on base station transmit power or EMF limits, may also lead to increased number of sites and should be avoided.

Finally, it is worth highlighting that any new investment, any new target or technology roll out should be confronted with its concrete impacts on operators' green targets. Very often it is better to optimize existing equipment or technology before rushing to new devices, equipment or networks. This relates notably to the launch of new mobile technology, like 6G. We should favour a progressive approach taking the utmost advantages of all the capacities and opportunities that a full 5G stand-alone network will offer, before rushing to 6G deployment. We call on the European Commission to adopt a clear position for a 6G aiming at helping ICT industry to meet its net zero carbon target and enabling others sectors to also deliver on their own goals.

B. Fostering a pro-investment approach: future awards processes

The White Paper considers improving future awards processes with various suggestions. In the following subsections, we give our views on the suggestions and detail how the sector can benefit from greater consistency of spectrum authorisation processes through clearly defined rules to ensure best award practices in each Member State but not through strict coordination on award timelines or centralized EU-level processes. ETNO welcomes the EC's investment-friendly proposals aiming at decreasing financial burden of high spectrum costs. In addition, ETNO provides views to spectrum approach for satellite "direct to device" service.

2.1. Strengthening EU level coordination of auction timing

ETNO believes that full harmonisation of timing for auctions or even simultaneous auctions would be detrimental to society due to different national circumstances. First, a harmonisation requirement concerning the timing risks delaying the awards for all EU countries in case one Member State would

[38] Spectrum the climate connection, GSMA, 2023.

not be ready for specific reasons. The assignment dates should be decided and harmonised mobile spectrum should be efficiently awarded to nationwide public mobile networks according to the specific national market demand. Second, awards taking place "too early" may also lead to difficulties, e.g. for the regulators to set the reserve prices and for the operators to valuate the spectrum correctly in advance of the award. As financial resources of operators are not scalable, auctioning spectrum too soon may force operators to invest in an asset they don't need at that moment and to postpone other more urgent investments.

In addition to European harmonised conditions being in place, all license conditions, e.g. possible national restrictions for using the spectrum, should be clearly defined before the award. Also, payments for the spectrum should not be required before the spectrum can be used. Moreover, we prefer that all spectrum in a harmonized band is included in same award process, but if part of the band is left for later award, it is important to provide full visibility for the award plan for this additional part, including the timeframe and conditions.

2.2. Notification mechanism replacing Peer Review

ETNO agrees with the European Commission that the voluntary Peer Review mechanism, created to facilitate exchange of views and peer learning among member states, has not proven to be effective. T herefore, E TNO welcomes the EC proposal for a mandatory notification mechanism similar to that used for market analysis as implemented under Article 32 of the EECC. We believe that this should foster the coordination of spectrum authorisation procedures and conditions in the internal market.

2.3. Measures to decrease financial burden of spectrum, e.g. adopting award process geared towards infrastructure investments

Looking towards the next wave of awards, ETNO considers that a proper review process would reassure investors against artificially high spectrum prices or undue market-shaping measures. In particular, a stronger role for the European Commission would foster compliance with the key provisions in the EECC: reserve prices should be based on opportunity cost (art. 42), maximising public revenues should not be an objective of award processes (art. 55), market shaping measures should be justified with a thoroughly substantiated market analysis (art. 52). Through the notification process the European Commission should also ensure that the expected award revenue is balanced with operator's commitments, e.g. regarding coverage obligations.

ETNO welcomes the European Commission's proposals to decrease the financial burden of spectrum through adopting an award process geared towards infrastructure investments. In general, when designing award process, and defining spectrum reserve prices, authorities must take into account deployment costs in an overall business case approach. Also, approaches to assign spectrum for free or with discounts against deployment commitments, could help bridging the significant investment gap in the deployment of advanced communications networks. However, such an assignment process should also be designed carefully to avoid excessive commitments, and situations where an operator could over-promise on commitments and eventually not fulfil them without consequences.

ETNO considers that a potential EU-level authorisation scheme could lead to higher costs and be risky considering the various national circumstances. It would also add significant complexity, especially when it implies introducing an EU-level scheme for terrestrial services. In addition, it is not beneficial to smaller or single-country operators who will face extra impediments. Mobile operators use a mix of bands for the provision of the services in the countries where they operate, and if there was an EU-level process for only one or some bands in such a scheme, it would cause further fragmentation. Our preference is therefore a better alignment of licensing approaches ensuring best practices in each Member State.

2.5. Spectrum approach for Satellite Services, including "direct to device"

Satellite Services can complement terrestrial broadband services, and as such should be licensed to operate in spectrum that is specifically allocated to the Satellite Services (FSS or MSS). However, we also note the recent developments in the satellite technology that may enable direct connectivity between LEO satellites and standard mobile handsets. In Europe this "direct to device" (D2D) service may be expected to have more marginal benefits compared to areas outside Europe, due to extensive coverage area of the terrestrial mobile service. However, as D2D is intended to supplement terrestrial mobile coverage in the mobile bands that are licensed to mobile operators, it is important to ensure clear and fair rules to avoid ambiguity on rights and obligations, while potentially allowing mobile and satellite operators to partner and reach mutually beneficial agreements.

Some countries have allowed or are planning to allow the D2D service under Article 4.4. of Radio Regulations, on the condition that a satellite D2D provider has an agreement with a mobile operator to use part of the spectrum licensed to the mobile operator, and that the D2D service is operated in full compliance with the requirements associated with the mobile licence, including with respect to interference to other spectrum users nationally or in the neighbouring countries. Concerning the international preparations of WRC-27, it is important to ensure that the terrestrial mobile networks will be protected and remain the primary use in the harmonised mobile bands, and that satellite solution should consequently be secondary to the terrestrial mobile service.

C. Governance structure

3.1 Improvement to the CEPT preparatory work for stronger EU positions in international fora

While the White Paper suggests that Member States should be able to take position regarding spectrum management in full independence from non-EU actors, ETNO believes that the participation of industry stakeholders and non-EU countries/entities in CEPT technical preparatory work for EU decisions on spectrum harmonisation and international negotiations is generally not an issue of concern for EU sovereignty, resilience, or security.

In Europe, there is a well-established process of harmonising technical usage conditions based on service and technology neutrality. The work in CEPT is usually based on consensus, and the final decisions are taken by European administrations. Twenty-seven Member States represent the majority of administrations (46 in total). In addition, in

the current framework EU Member States already steer the spectrum harmonisation work in CEPT through EC mandates, and the EC decisions are finalised among EU members in the Radio Spectrum Committee. The current process allows for all relevant stakeholders, including industry players, to be involved in the European preparatory activities for international negotiations. An ad-hoc technical group of Member States representatives may not allow for the same level of participation and transparency. If an ad-hoc group is considered necessary for specific issues where EU sovereignty might be at stake, there should be clear criteria to determine the issues which are covered by this ad-hoc group.

Under the current regime, EU decisions are also backed by CEPT preparatory work, which decreases fragmentation between the EU and other European countries. We believe that clear mandates by the EC to CEPT and strong consensus in the EU positions concerning international negotiations allows them to steer work of CEPT under the current regime, without the additional burden and costs of an additional set-up of an ad-hoc group. We note that often EU Member States have very diverging views on the future demands and use of spectrum. For example, in the context of WRC-23 preparation, the RSPG failed to provide a clear opinion on the upper 6 GHz being identified for IMT, and instead relied on other regions to take the lead. Non-EU countries thus influenced WRC preparatory meetings in CEPT and large US tech firms may have influenced some European states (and thus the CEPT process). Possibilities to address this should be considered, bearing in mind that CEPT has a role in the WRC discussions as a regional organisation. We believe that clear and early defined and justified future spectrum roadmaps also support the decisions for WRC. When preparing EU decisions on spectrum harmonisation or for international negotiations, ETNO requests that the decision making is backed-up by appropriate socio-economic cost-benefit analysis. Such analysis should justify for example the RSPG Opinions and Recommendations, and EC mandates to CEPT. We believe this would also help creating consensus within EU and support the technical harmonization work.

3.2 Addressing harmful interferences

The White Paper mentions the need for Members States and the European Commission to address harmful radio interference by acting in support of bilateral and multilateral negotiations with third countries. As a first step, the EU should ensure good conditions in international agreements (e.g. Radio Regulations) for harmonised EU mobile bands. Recent experiences (e.g. 3.6-3.8 GHz) show that an important precondition to secure against the use of restrictions is that services operated in the EU are backed by a primary allocation in the Radio Regulation. Only then would the EU Member States have the right to request coordination for protecting the services from third countries. It is also important to note that the severity of interference can depend on the band, geography, radio service, third country demand and demand in the EU Member State itself, so the same coordination agreement with a third country and all Member States may not be optimal for all borders. The existing process is largely sufficient and Member States bordering third countries have established mechanisms to deal with issues bilaterally. However, enhanced information exchange within the EU and a fallback option of EU support upon the request of an affected Member State (e.g. similar to RSPG process) would be useful to account for scenarios in which a Member State faces difficulties in reaching bilateral agreements.

7) Future of access regulation

1. *Changes in competition require changes in regulatory approach*

As acknowledged by the White Paper, Europe's regulatory approach to telecom operators requires a profound rethinking. Since the adoption of the EECC, technological developments and market realities have significantly evolved: copper-based state network and service monopolies have been almost ubiquitously replaced by competing network operators rolling out their own gigabit infrastructures.

The characteristics of today's markets require a fundamentally reformed regulatory framework that only focuses exceptionally on addressing any remaining challenges in an agile and proportionate manner, by supporting investment and the achievement of the digital decade targets. Such an approach should comprise the following elements:

- Firstly, ex post competition law and the Gigabit Infrastructure Act (GIA) should be the default regime applicable to telecoms.

- Secondly, as a consequence of the above, the EC Recommendation on 'Relevant Markets' should rightly be repealed and SMP regulation abandoned (further explained under points 2 and 3 below).

- Thirdly, in exceptional cases when a 'safety net' is still necessary, a new approach – instead of SMP – should apply symmetrically to all market players addressing local bottlenecks irrespective of who controls them. Key element of this approach must be the availability of competing retail connectivity offers to end-users, instead of the promotion of entry into wholesale markets. The analysis should be tailored to "access bottlenecks" at the local level and result in more symmetric remedies for these local bottlenecks, compared with today's SMP-based regulation. Only in exceptional circumstances, where enduring non-replicable access bottlenecks are expected to persist and lead to an expected long-term lack of infrastructure-based competition that is not offset by wholesale access agreements, targeted ex-ante obligations may be applied locally, case-by-case, to any relevant company (further explained under point 4 below).

- Fourthly, against the background of deregulation there should be no 'regulation through the backdoor' in the form of an 'EU-wide wholesale access product (please refer to section below).

In summary, European policymakers need to substantially modernise the existing framework to take into account market and technological developments and the need to support network investments and take-up of new services. There are interdependencies between preventing bottlenecks; safeguarding competition; enabling investment and technological rollout; and preserving qualitative, secure and resilient networks. This shows the importance of keeping a long-term perspective in mind when assessing competition and determining the necessity of ex ante regulation as a safety net. Additionally, by creating legal certainty, such an approach would be instrumental to foster investment and innovation that

enhance welfare for both consumer and businesses.

2. *Shortcoming of the "list of relevant markets"*

Due to the list of Relevant Markets identified in the EC Recommendation, the current regulatory practice generally assumes market failure and the need for regulation instead of proving or basing it on actual shortcomings of meeting end users' demand at a local level.

The existing system of defining markets, designating SMP operators and applying remedies is built on a view of markets rooted in the past that does not sufficiently take into account a forward-looking approach of the market, nor the new dynamics of competition coming from alternative players. It is often ill-founded, not starting – as it should – with a proper retail market assessment focusing on market dynamics and developments, as well as the availability of alternative broadband access service offers.

This means that the regulatory approach based on relevant markets should be repealed and abolished. As a consequence, we support the EC proposal that no markets should be included to the list of markets susceptible to ex ante regulation. In particular, the introduction of a new relevant market for physical infrastructure access (PIA) would be unwarranted. Instead, there should be a general presumption of effective competition and the sufficiency of competition law and general symmetric regulation under the GIA to ensure effective competition in the telecoms markets, with a safety net for endurable nonreplicable bottlenecks in exceptional cases.

3. *SMP-based regulation is increasingly unfit-for-purpose*

The current market analysis process is overly complex, subjective and backward-looking (not corresponding to the requirement to conduct a forward-looking assessment beyond the boundaries of the review period). Although the EU regulatory framework requires regulators to consider the pro-competitive effects of co-investment, commitments, voluntary wholesale arrangements as well as infrastructure-competition and any other competitive constraint in a forward-looking manner, in practice, the market analysis does not adequately capture these circumstances and thus fails to reduce the regulatory burden accordingly. Forward-looking infrastructure-competition is usually not considered by National Regulatory Authorities (NRAs) even if based on binding coverage plans of operators, such as mapping commitments under the EECC or state aid procedures.

There is also an underestimation of competitive constraints in the scope of the analyses and the absence of harmonised criteria for the geographical segmentation in the context of the competitive assessment and definition of markets /segmentation of remedies. This has in practice led to regulatory intervention not being guided by the principle of proportionality and the least intrusive application and to different national approaches by regulators, ultimately creating a self-fulfilling cycle of market intervention.

Adding to this, there is also an institutional dimension, since authorities, and especially NRAs and BEREC, have a self-interest to maintain current (high) levels of regulation for as long as possible.

4. *How a revised regulatory framework for access should work*

New market situations, technological developments and changes in competition require a shift of policy focus. Instead of abstract market shares, the analysis for exceptional 'safety net' regulation should focus on identifying the areas where service choice for end users may be limited with the highest possible granularity. This view is strongly supported by the letter and spirit of the Declaration of Digital Rights[39] and the connectivity targets of the Digital Decade Policy Programme.

Regulation should be limited to local access bottlenecks, without actual or potential competitiveness of service availability at retail level in a given coverage area, where a VHCN operator controls an endurable non-replicable input and neither provides for a reasonable commercial wholesale offer nor other arrangements. In this regard, we welcome the EC's view in the White Paper, "*where end customers benefit from a variety of competing services based on at least two independent fixed broadband networks",* concluding that ex post control alone could be sufficient. However, for the avoidance of doubt and as laid out above, the availability of only one broadband network should not by itself presume the existence of a local endurable non-replicable bottleneck in that area, in the case there is a reasonable commercial wholesale offer or other arrangements available.

Any competitive assessment should therefore be based on a (re-)evaluation of the situation at the retail level, i.e. at least potential availability of competing service offers to individual customers in a given area, and with the result of eliminating regulation if an area is deemed competitive. Otherwise, a regulatory intervention invariably becomes overfocused on the protection of individual competitors, instead of the protection of competition and the variety of choice and quality for end users.

Unless barriers to the provision of service variety are identified in line with the assessment criteria outlined above, no remedies shall be imposed.

8) EU-wide wholesale access product

The European wholesale access product proposed in the White Paper creates too many uncertainties regarding its specific nature and objective. Currently, the concept lacks purpose and a definition, which would adequately describe the product and explain its implications and reach.

We question the idea of a regulated wholesale product at EU level, because it does not target market failure as a possible safety net in view of the removal of relevant markets. In addition, it does not create crucially needed investment incentives for operators by tackling hurdles coming from national rules, non-harmonized implementation or constraints to the creation of sustainable national market structures that can enable network operators achieving scale for investment. We believe that this regulated common EU standardized product will not help to significantly address issues on the digital single market. European products should be created on voluntary and commercial basis and not artificially through regulation. As such, ETNO is of the opinion that the definition of an EU product would create increased constraints with further regulation

[39] European Declaration on Digital Rights and Principles for the Digital Decade (2023/C 23/01)

at EU level and risks adverse impacts on national competitive dynamics.

Moreover, such a pan-European product could lead to imbalances between countries and markets. This is because it would facilitate foreign (non-EU) players that do not invest in networks to compete more easily in the national markets across the EU, amplified by the "country of origin" authorisation and adding further pressure onto already the stressed ROIC of national network operators. In addition, different levels of fibre rollout and varying VHCN architectures, technologies, prices and technical conditions across the EU will very likely increase complexity when defining the reach and specifications of the wholesale product, which in turn would delay investment decisions. The principle of technology neutrality renders it difficult to define a common EU standardised product and we therefore ask the EC to carefully consider its negative consequences, such as aspects related to the proportionality of operational and IT challenges.

We strongly believe that the digital single market can be achieved through harmonised sector-specific rules, the removal of unjustified existing obligations and a move towards horizontal EU law notably in consumer law or data protection rules. In this context, the EC should play an enhanced role by ensuring that similar measures are applied to similar competitive problems and by guiding the transition towards a new framework enabling scale, simplification and sustainable market structures.

In a broader context of wholesale price regulation, we call on the EC to take into account the current situation in the telecoms market and potential effects on investments, before introducing any new actions at wholesale level.

9) Copper switch-off

As regards copper switch-off, we agree with the Commission that the migration to gigabit-speed capable technologies is desirable for a multitude of reasons. For instance, in terms of environmental benefits, decommissioning of legacy networks is one of the biggest actions an operator can take to increase efficiency. For fixed networks, reducing copper and active equipment that uses copper can provide significant reductions in operators' energy usage. A Fiber-To-The-Home (FTTH) line not only enables higher network performance but also increases energy efficiency by at least 80% compared to copper.[40] Moreover, FTTH networks require less field operations for network maintenance or customer service, which has a significative impact on emissions.

However, while we are convinced that copper switch off should be incentivised, supported and facilitated, it should not be enforced.

The credible path for economically sustainable and pro-competitive switch-off of copper lies in the planning of the copper owner and in streamlined procedures by NRAs that do not make the process burdensome and bureaucratic and stand in the way of an operator's willingness to migrate. More than that, simple, effective, and streamlined rules for facilitating network rollout and access to existing passive infrastructure are critical, and until now, have not been adequately addressed through existing legislation.

[40] State of Digital Communications, Analysys Mason, 2024.

It is therefore important that operators, instead of being forced to switch copper off by certain dates, receive strong support from national policy makers and regulators to assist them in their switch-off efforts. In this context, the EC should provide national governments and regulators with a toolbox, consisting of a guidance and best practices, to ensure that the relevant public policies are in place within the Member States.

We also believe that a fixed deadline will paradoxically stand in the way of reaching the Digital Decade 2030 connectivity target in countries with a lower market maturity. One of the important bottlenecks faced by some European telecom operators today is the need for network construction planning and rollout capacities.[41] Any binding EU measures mandating copper switch-off by certain dates would likely lead to increased construction prices. As a consequence, this will further reduce the already limited resources of EU operators for expanding fibre networks. Furthermore, a fixed timeline would not take into account the different levels of market maturity for VHCN networks in the different Member States nor the capacity of operators to undertake the process in such a short period of time. Hence, we believe a binding date would in reality hamper VHC network rollout and a smooth transition of retail and wholesale customers to the new services rather than promote it.

With this in mind, it is important that all measures by the NRA, enabling the migration of customers to the new network, allow for a commercially viable transition once the technical migration has been completed and all other conditions have been met. The decommissioning process needs to fully remain at the technical and commercial discretion of the network operator, also to allow operators to overbuild their copper network with fibre to prevent the emergence of new local monopolies.

That being said, the operator of a copper network should never be obliged to migrate to a gigabit network deployed by another operator and that is not under its own control. This would otherwise impact an important investment decision of the copper operator, which is also economic decision as it distinguishes an owning model from a renting model, with considerable varying costs involved. Imposing a date for such migrations would be a disproportionate action.

In order to ensure a smooth transition to gigabit capable fixed networks, it is important not to distort the market by specific regulatory price decisions on wholesale copper, which would make copper-based products more attractive in relation to fibre-based products. Copper price decreases would have such an effect[42]. In this context, copper network operators should be allowed to increase prices. NRAs should support and enable this to encourage the decommissioning process as also stated in the EC Gigabit Recommendation that should be implemented by NRAs.

The monitoring or supervision of the migration process should be limited to situations where issues are expected to occur and depends on the specific copper switch-off plans of the respective SMP operator. We are convinced that copper switch-off can be

[41] "Planning capacity" meaning qualified project designers who produce the planning paperwork for applications for building permits, and „rollout capacity" meaning a very broad range of works and machinery necessary for actual digging and ground restoration.

[42] Gigabit Recommendation (2024): '*NRAs may consider, as one option among several, a progressive relaxation of the price control obligation, by allowing the SMP operator to progressively increase wholesale prices for access to copper networks.*'

carried out by specific areas – one-by-one or several in parallel – as the transition typically occurs gradually across national territories. More importantly, each country has its own state of development of VHCNs and infrastructure-competition/market structure, and therefore, switch-off may significantly vary across EU countries. At the same time, any new EU policy should also not distort countries where the phase-out is already well on the way.

As far as regards regulatory obligations, ETNO supports the EC's Gigabit Recommendation that shortened the notice period to 2-3 years, but believes that this should be further reduced to one year. In addition, the start of the notice period should not depend on additional constraints or conditions regarding coverage or even take-up that cannot be controlled by the SMP operator and that may have the effect of delaying the implementation of its decommissioning plan.

10) Universal service and affordability of digital infrastructure

Since the implementation of provisions on Universal Service Obligation (USO), the market for electronic communication services to consumers has evolved significantly. Today's market features a huge variety of offers that match the needs of consumers and contribute to the USO objectives. It has also become apparent that specific providers are carrying this financial burden while others are free-riding. At the same time telecommunication prices have constantly been decreasing, which means that US obligations are no longer justifiable in terms of affordability.

Based on the current level of deployment and coverage of both fixed and mobile networks, the designation of an operator as a universal service provider is not justified, neither from the point of view of availability nor that of affordability. From the point of view of availability, private operators have already developed a sufficiently wide broadband network coverage to respond to and cover the needs of users, and public subsidies have been granted to cover the areas that are not connected through private means.

The White Paper recognises the above and puts forward a new source of possible digital divide referring to availability and affordability of VHCN connectivity. In our view, this supposed future scenario contradicts the basic idea of the USO and would result in an additional and disproportionate burden for the telecom sector. An extension of the universal service would lead to considerable market distortions, which risk negatively impacting the development of very high capacity networks. It should be mentioned that prices for telecom services in the EU are already relatively low. Only a few percent of the household income are spent on telecom services[43]. Furthermore, end users with special social needs or who are low income are supported by the public welfare system and have access to the services provided by the market. Adding to this, European consumers with disabilities have access to a variety of offerings to communicate easily (e.g. text telephony being replaced by chat/video telephony), also due to the

[43] Final consumption expenditure of households, by consumption purpose, Eurostat, 2024.

application of the European Accessibility Act.

For the limited number of consumers, who remain affected due to affordability across EU, we consider that the most efficient way to address the issue is public intervention through the provision of direct subsidies such as vouchers, as also indicated in the WP. Using public funding instruments is both more justifiable and more efficient; general taxes motivate public bodies to maximize public economic welfare. Consumers who are eligible for a voucher, will have the ability to select the operator and services of their own choice.

In conclusion, ETNO deems that, also on this issue, a scenario should be put forward to provide the basis for a future legislative review of the EECC rules aimed at presuming no need for specific obligations regarding availability and affordability universal service obligations also in a full-VHCNs context. Consequently, we believe that the universal obligation regime should be removed from future telecom regulation and support vulnerable users should be provided through the public welfare system.

11) Sustainability

The majority of ETNO members aim to be net zero carbon companies (scope 1, 2 and 3), reducing CO2 emissions for all network technologies to net-zero. ETNO members have taken decisive actions, over the years, to cut their carbon emissions and energy consumption, while ensuring the continuous development of new-generation networks to achieve the twin transition. On the one hand, telecom operators are largely investing in the roll out of more efficient networks. This resulted in an increase in energy efficiency, which allowed the total energy consumption to remain stable, despite the sharp increase in traffic volume. On the other hand, ETNO members are also reducing their footprint thanks to massive use of and investments in renewable resources, and measures increasing circularity for devices and network equipment.

However, growing data traffic volumes[44] require network infrastructure expansion, driving up energy consumption and embodied emissions from network equipment, civil work and operations. Mobile access network energy consumption is expected to increase despite energy efficiency gains due to more powerful equipment and network densification[45].

In addition, while the EC estimates that €174 billion investment is needed in Europe's telecom infrastructure to achieve the EU's 2030 connectivity targets, ensuring financial stability of the sector and promoting investments in low-carbon networks is crucial to foster competitive and innovative markets and guaranteeing widespread coverage for all citizens.

ETNO believes that the White Paper should not miss out the opportunity to propose a new political and regulatory approach which addresses the challenges and opportunities our sector is facing with the green transition. Therefore, the European Commission should rethink the approach to ICT to allow for a decarbonation of ICT and through ICT in line with the net zero objectives.

In this regard, ETNO thinks it is essential that actions taken following up on the White

[44] "The evolution of data growth in Europe", Arthur D. Little, 2023.

[45] "The future of the electronic communications sector and its infrastructure", ETNO-GSMA Response to the Exploratory Consultation, May 2023.

Paper foster a regulatory and policy environment that valorise initiatives in line with the Green Deal objectives by incentivising, notably:

- Efficient networks and legacy switch-off without a cut-off date[46];
- Inclusion of telecommunication networks in the EU taxonomy with relevant Technical Screening Criteria;
- Infrastructure sharing led by operators and consolidation, as these practices contribute to network greening by reducing carbon emissions and increasing energy savings;
- A spectrum policy that has the ability of enhancing environmental sustainability[47];
- Circularity through the value chain for devices and network equipment as most of carbon emissions from the ICT sector in Europe are coming from scope 3 (typically 80%)[48];
- Incentivise better efficiency in data traffic generated by large content providers;
- Enable electronic communication operators to auto generate renewable energy.

In line with this, we believe that the European Commission should ensure that current and future networks, such as 6G, are designed to be part of a net zero carbon trajectory and to enable the development of services that will help other sectors to achieve their own decarbonisation trajectories.

Finally, the current EC approach doesn't consider adaptation to climate change in the White Paper while it is a key challenge that the digital sector has to face. On the one hand climate change hazards must be considered in the design and building of infrastructure and fields operations procedure to increase service resilience. On the other hand, digital services are key to ensure business continuity and even emergency services in case of climate hazards. Strategic sectors such as energy, transport and telecommunications are interdependent and coordinate actions are required during climate hazards. We call on the European Commission to consider climate change adaptation in its sustainability strategy.

A. Towards more efficient ECNs

Beyond enabling carbon emission reductions of other industries (e.g. smart cities, precision agriculture, healthcare, transport, energy), telecom companies have worked and are working on improving energy efficiency in their own networks thanks to the deployment of next generation high-speed networks. The telecom sector has already identified legacy switch-off[49], spectrum[50], commercially led network sharing and consolidation, use of renewables and circularity as the five main elements contributing to an energy efficiency strategy for greening digital networks. Below we describe how the three latter elements can support that strategy.

[46] See section "Copper and 2G/3G switch-off"
[47] See section spectrum
[48] https://www.arcep.fr/nos-sujets/numerique-et-environnement.html
[49] See section "Copper and 2G/3G switch-off
[50] See section on Spectrum

1.1. Network sharing and consolidation

Regardless of usage, operators must maintain their networks continuously operational. Even when networks carry little to no traffic, most installed network elements consume nearly the same amount of power at full load as in off-peak hours. This proves inefficient for legacy sites, given the decreasing number of users on these networks, and for mobile sites at certain times at night when demand for service may drop to zero. Moreover, operators often overlap their network infrastructures, resulting in overbuilding, hence duplicating energy consumption and having a larger carbon footprint. Voluntary network sharing can address these inefficiencies and we think it should be supported by removing the hurdles to this practice.

Mergers could also allow operators to fully expand the range of assets being shared, get the most synergies and minimise the transaction costs inherent in a commercial deal between independent companies.

1.2. Renewable energies

In addition to increasing energy efficiency, ETNO members are enhancing the greening of digital networks by purchasing or generating renewable energy. European operators are leading globally as they are powered by 80% renewable electricity, on average[51]. The ambition is to accelerate the zero-emissions transition across the sector, with further significant investments in renewables.

Alongside these operator initiatives, policy makers should therefore facilitate access to low carbon energy at an affordable price, particularly in the case of Power Purchase Agreements (PPAs) by streamlining the regulatory and accounting frameworks. Additionally, the auto generation of renewable energy by electronic communication operators (at telecom sites as well as at buildings and lands) should be supported.

1.3. Circularity

The majority of ETNO members develop circularity programs that prioritise the reuse of devices and network equipment, alongside the recycling of outdated equipment. As most of the carbon emissions from the ICT sector in Europe are coming from the scope 3 (typically 80%), circularity is of central importance to be more sustainable. E-waste is an essential point which needs to be tackled as the waste stream of electrical and electronic equipment (WEEE) is growing by 2% each year, while less than 40% of electronic waste is estimated to be recycled in the EU.

Moreover, such circularity practices are also necessary for the good governance of critical raw material within the EU. Circularity initiatives should be promoted, e.g:

- Foster the use of recycled materials in network hardware.
- Increase the repairability of network equipment.
- Facilitate the resale of used equipment.
- Foster the development of a European refurbish/reuse marketplace.

It is important that the European Commission encourages ETNO members' efforts supporting circular economy

[51] State of Digital Communications, Analysys Mason, 2024.

principles for their network equipment by urging manufacturers to increase their lifespan and develop refurbishment platforms. The review of the Directive on Waste from Electrical and Electronic Equipment (WEEE) is an opportunity to support the circular economy[52].

A number of ETNO members and other telecoms companies have developed the Eco rating[53]. Its methodology combines the various aspects of the environmental performance into a scoring system related to durability, reparability, recyclability as well as climate and resource efficiency. ETNO proposes the integration of Eco Rating**,** as a Product Environmental Footprint (PEF) thereby providing consumers with transparent information to make sustainable choices and making sustainability a competitive factor. Thus, the upcoming Green Claims directive should include the Product Environmental Footprint methodology and ensure Eco Rating continues being used.

B. Towards more efficient use of ECNs

In addition to more efficient ECNs, ETNO welcomes the proposal of the European Commission for a more efficient use of the networks. Consider how data traffic can be optimised by content providers (title 2.1) and the uptake of digital solutions is also key (title 2.2).

2.1. Optimisation of data traffic by content providers

Data traffic is expected to triple between 2023 and 2028[54] and it is estimated that video traffic will account for 73% of the total traffic in 2023 and will reach 80% by 2029[55]. In general, video traffic is not considered to contribute much in the fight against climate change despite its environmental cost in the form of energy consumption. The challenge is that end users and content providers do not have clear incentives to save on traffic. Customers, on the one hand, have a preference for simple unlimited tariffs. Competition between connectivity suppliers has responded to that preference, and the share of customers on unlimited plans is constantly growing. CAPs, on the other hand, face a very small variable cost for delivering traffic, due to the existing internet price structure. That induces them to send a higher audiovisual quality than required by the user experience, or to overload the network with unwanted ads.

To address these challenges, ETNO members are improving the operations of existing mobile and fixed networks, so far resulting in a flat or even a reduced level of energy consumption of their own operations[56] and field operations volume. In addition, legacy network switch-off, use of renewable energy, voluntary network sharing agreements and development of circularity, telecom operators are increasingly using big data and AI applications to optimise data traffic and systems' performance. However, due to the steady rise in data traffic, we see the risk that

[52] In Europe, the WEEE collection system can be improved to harmonise information requirements, support collective schemes, and redefine Extended Producer Responsibility (EPR). Variations between member states complicate waste management and reduce data accuracy. Prioritizing collective schemes and involving more the producers would encourage better product design for recycling. Simplifying WEEE transfer rules between Member States, such as allowing local testing, would facilitate circular economy and reduce carbon emissions.

[53] https://www.ecoratingdevices.com/#about-us

[54] The Mobile Economy Europe 2023, GSMA, 2023.

[55] Mobile data traffic outlook, Ericsson, November 2023.

current efficiency measures will not be enough to keep up with the increase in energy consumption driven by traffic volumes. This may lead to a tipping point, when energy consumption outgrows efficiency measures, especially since some of the efficiency measures have a one-off effect (i.e. migration to more efficient technologies).

ETNO would like to stress that ECNs' impact on the environment can only make a difference if all relevant players (e.g. ECNs, large CAPs, end users, manufacturers) equally commit to green and sustainable initiatives. The overall impact can only be substantial if it is done across the value chain, notably by incentivising large CAPs to invest in more efficient data transmission thanks to a price signal[57] and to avoid unnecessary traffic.

2.2. The positive effect of green digitalisation

Once we account for the whole value chain, we expect the positive effects of digitalisation via "digital for green services" to help mitigate the negative impact of increasing data traffic which might lead to increasing energy consumption despite all undertaken efficiency measures (cf. above). Research by BCG shows that the uptake of digital solutions enabled by next generation connectivity can reduce carbon emissions by up to 15%[58].

For this enablement effect to materialise, incentives need to be put in place for end users, companies and governmental agencies to account in their consumption, production and investment decisions for the benefits for society of lower emissions or lower energy use. ETNO members are raising awareness by promoting specific connectivity products with a value proposition focused on reducing the environmental footprint of their customers.

Digital solutions play a crucial role in the green transition by offering innovative approaches to tackle environmental challenges, driving efficiency, and promoting sustainable practices across various sectors. ETNO would welcome a clear definition of "ICT solution", which reflects market realities and which is inspired by existing definitions, such as the one from ITU-T L. 1480. In addition, the European Commission could promote more strongly policies to foster the uptake of digital services that help users reduce their environmental footprint (e.g. smart cities). Such policies would induce end users to be more environmentally friendly, and indirectly make investments in networks and connectivity more attractive.

C. Sustainable financing of the sector

Building modern telecommunication network infrastructure is capital intensive but crucial for enhancing European competitiveness. Hence, promoting investments in green digital networks, aligned with EU sustainability standards is crucial. The EU Taxonomy is a key regulatory framework for achieving the EU's climate and energy goals. It helps direct capital flows towards green investments, increasing attractiveness for capital markets to contribute to the EU digital green objectives by investing in secure and sustainable networks.

ETNO strongly supports the reference stating the intent of engagement with the industry to

[57] See part IV. 2. B "Fairness in the internet value chain".

[58] Connectivity & Beyond How Telcos Can Accelerate a Digital Future for All. ETNO and Boston Consulting Group. March 2021.

further improve the usability and potential scope of the EU Taxonomy for green investment in ECNs ensuring it is based on robust and credible science-based metrics.

Additionally, the work undertaken by the European Green Digital Coalition should be decoupled from any mentioning related to the EU Taxonomy[59] since the developed methodology acknowledges a passive rather than an active role for network infrastructures.

Finally, the sector considers the JRC Technical Report for the identification of common indicators for measuring the environmental footprint of electronic communications networks (ECNs) for the provision of electronic communications services (ECSs)[60] as a suitable starting point as the results have been obtained through consultation and discussion with operators. The European Commission should build upon this report as a basis for drafting the code of conduct, which must involve a close engagement of relevant industry stakeholders.

Therefore, the European Commission should include ECNs as a taxonomy-eligible economic activity in the next review of the Climate Delegated Act, with relevant technical screening criteria, developed together with the sector[61], and using the JRC report as a starting point to develop a comprehensive Code of Conduct for Electronic Communication Networks.

12) High-level recommendations pillar II

- [Scale] Support measures aimed at enhancing the European Single Market and propose a practical action plan for its achievement, including key milestones and achievable next steps. As such, increasing in-market scale and voluntary industry cooperation, and harmonization of national legislation should be a priority.

- [Competition rules] Align competition law with the objectives of a new industrial policy for telecoms with a review of the EU Merger Regulation, enabling economies of scale through in-market scale.

- [Convergence and level playing field] Different actors of the connectivity ecosystem providing comparable services should be subject to the same rules. The scope of the telecom regulatory framework should be extended to include all relevant actors in the digital connectivity ecosystem, based on a uniform set of rules applicable to telecoms and other players providing substitute services.

- [Fairness in the internet value chain]: We believe that the current regulatory and bargaining asymmetries in the internet value-chain should be corrected and the regulatory intervention introducing a dispute resolution mechanism between

[59] European Green Deal Coalition, Net Carbon Impact Assessment Methodology for ICT Solutions report. February 2024. EGDC report, p.41*"Components defined within the solution boundary may already exist prior to implementation of the ICT solution, and therefore the associated embodied and end-of-life emissions of these components occur in the reference scenario and should be excluded from assessment of first order effects."*

[60] Identifying common indicators for measuring the environmental footprint of electronic communications networks (ECNs) for the provision of electronic communications services (ECSs), Baldini, G., Cerutti, I. and Chountala, C., Publications Office of the European Union.

[61] ETNO-GSMA submission to the EU taxonomy stakeholder request mechanism, December 2023.

ISPs and large CAPs is necessary to ensure that large CAPs pay a fair and adequate price to ISPs for a valuable IP data transport services.

- [Open Internet Regulation]: ETNO calls for recognising a lack of clarity in the application of the OIR that could hamper innovation. Consequently, the EC should deliver a Recommendation to national regulatory authorities ensuring the development of 5G network slicing based use cases and overall network innovation in the EU. Also, the key principles of the internet ecosystem should be applicable to all market players.

  [Regulatory simplification] Streamline sectorial regulation, remove unnecessary rules, and further harmonize the remaining sector-specific with horizontal rules at EU level as well as national level (e.g. consumer, spectrum, security, taxation).

- [Spectrum] Ensure long term business certainty through predictable license holdings supported by early assessment, prolongation, tacit renewal, and indefinite licenses, and through clear roadmaps for future spectrum availability justified with socioeconomic cost-benefit analysis. Support a pro-investment approach through greater consistency of award processes, clearly defined rules to ensure best award practices in each Member, a mandatory notification process to the EC, and spectrum prices and fees supporting a pro-investment policy, including the principle of "bidding geared towards investment".

- [Access regulation] Come up with a new access regulatory system (scenario 5) that relies by default, on ex post intervention (general competition law) and on existing symmetric regulation concerning access to physical infrastructure (GIA). Consequently, the Recommendation on relevant markets should be repealed. Only in exceptional circumstances, when persistent local access bottlenecks result in a lack of choice for end-users, a safety net should come in effect in the form of targeted application of ex ante obligations.

- [Copper switch-off] Do not take a one-size-fits-all approach for copper switch-off. Implement a guidance and best practices to support decommissioning plans for legacy networks, keeping in mind the different national circumstances and the need for flexible timelines (scenario 5). Focus should lie on setting the right incentives to phase-out copper and facilitating the transition of customers to new networks.

- [Universal service obligation] We see no need for specific obligations regarding availability and affordability universal service obligations, also in a full-VHCNs context, and consequently, we believe that the universal obligation regime should be removed from the future telecom regulatory framework and support vulnerable users should be provided through the public welfare system.

- [Sustainability] The European Commission should promote circular economy also for network equipment through the ICT value chain, support operators led network sharing, include ECNs as a taxonomy-eligible economic activity in the next review of the Climate Delegated Act, with relevant technical screening criteria.

V. Pillar III: Secure & resilient digital infrastructures

The cybersecurity 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 infrastructure and the gateway for essential industry and government services, bear a unique responsibility. Telecom operators have a special duty to safeguard their customers from cyber threats and are making significant investments in the security and resilience of their networks. Ensuring a secure and resilient infrastructure is imperative for telcos, as they serve as a "cyber shield" for European society.

Across all sectors, deepening European cyber resilience entails a number of different measures: strengthening multilateral cooperation for the prevention, detection, containment, investigation and prosecution of cybercrime; promoting common cybersecurity standards; defining and monitoring new key indicators or KPIs on investment in cyber security and specialized staff to track advances, particularly in SMEs; exploring new funding mechanisms and tax incentives in this area, which, like R&D, have spillover effects on the economy; enhancing the quality of cybersecurity rating agencies in risk assessment, to facilitate relevant cyber insurance; fostering capacity building, training and addressing the shortage of cyber professionals; and improving harmonization and coordination, dealing with the interaction between different regulations, implementations and competent authorities.

1) Need for security in the supply and in the operation of networks

The telecommunication sector is preparing for major changes in its supply chain landscape. With the advent of 5G, operators are deploying a virtualized, software-defined, and cloud-dependent infrastructure. The telecom networks and services of tomorrow will be increasingly delivered by an environment of operators, vendors, and managed service providers, where more functions will move closer to the user and will be outsourced to suppliers. Already today, over 70% of telecom security incidents in Europe are system failures, such as hardware malfunctions, software bugs, and faulty software updates[62]. The deeper interdependence of providers and third parties in the open, disaggregated 5G architecture will expand the attack surface of the network.

Our sector has been a consistent advocate for shared responsibility in ensuring high levels of security across the whole telecom supply chain. Two landmark laws crafted under the current EU political mandate, the NIS 2 Directive and the Cyber Resilience Act (CRA), aim to increase the security and resilience of digital infrastructures and of the connected products that are integrated into telecom networks.

The coexistence of different European cyber risk regulations, management and reporting obligations (e.g. GDPR, NIS2, CRA, DORA, EECC, CER), alongside national security

[62] Telecom Security Incidents 2022, ENISA (2014)

requirements and different enforcement authorities, risks hampering legal certainty and consistency. The interplay between different regulations needs to be assessed and a mechanism should be foreseen to improve coordination between authorities with different competences in the field of cybersecurity.

Especially for companies operating across multiple EU markets, removing regulatory obstacles to cross-border activities and encouraging cross-border cooperation would enhance the security and resilience of their networks. The implementation of the NIS 2 and CRA should harmonize security requirements across the EU single market, to facilitate cooperation between authorities and operators in fighting large-scale threats. Regulatory compliance and reporting requirements should be streamlined as much as possible, enabling operators to allocate resources towards bolstering the resilience of networks and services.

The implementation of the recommendations put forth by the recent NIS Cooperation Group report on the cybersecurity and resiliency of the EU communications infrastructures and networks should avoid leading to additional, separate 'toolboxes' resulting in further fragmentation of national cybersecurity requirements for different digital networks across the EU.

Reflecting on the relevance of investment and single market objectives to security and resilience is crucial. The investment conditions and the ability to operate networks across borders have significant implications for operators' capacity to invest in network security efficiently. Looking ahead, especially considering geopolitical tensions and new regulatory requirements, these investments become even more significant. It should be considered whether certain aspects, particularly those involved in heightened preparedness and defence, should be publicly funded. The same principle applies to the resilience of networks, ensuring they can withstand challenges like electricity blackouts, extreme weather events, and external attacks.

2) Insurance and the problem of cyber rating agencies

Concerns about cybersecurity are also reflected in the growing share of firms taking insurance measures to protect against financial losses from cyber incidents relative to general liability insurance contracts. The insurance industry is also instrumental in mitigating and containing risks throughout the ecosystem. Yet, the number of organizations holding a cyber-insurance policy is quite small and unequal (75% for high revenue organizations and 25% for lower revenue organizations)[63]. There have been calls for greater transparency in the insurance industry, especially concerning methods of rate-setting and incentivizing cyber behaviours through reduced premiums. Collaboration both within the industry and with civil society counterparts will be needed to address skyrocketing costs.

In recent years, several cybersecurity rating agencies based in the US have issued rankings regarding the cyber risk posture of enterprises, primarily based on assessments of their publicly available IP addresses and domain names. Their output, a cybersecurity score, can be used by third parties to assess

63 World Economic Forum, Global Cybersecurity Outlook 2024

the security of the business. Concerns have arisen regarding the methodologies used by these agencies, especially when the evaluated assets are not under the control of the surveyed entity. These methodological shortcomings pose a particular challenge for telecommunications operators, who often allocate blocks of IP addresses to their customers for their own use. As the adoption of cybersecurity rating services increases, so do the risks and detrimental effects to businesses associated with potentially misleading assessments.

ETNO has stressed the need to launch a broad debate to establish minimum requirements for cyber rating agencies, mirroring the regulatory approach taken with credit rating agencies in the EU[64]. The objective is to enhance transparency, elevate the quality of the rating process, and enhance the accountability of agencies. A possible EU legal framework concerning cyber rating agencies might include: publishing the methodology employed, ensuring independence, mandating a presence within the EU, addressing claims from evaluated companies regarding data accuracy, establishing an official EU registry for certified cyber rating agencies, and potentially designating an EU agency responsible for monitoring and surveillance of these agencies.

3) Towards secure communication using quantum and post-quantum technologies

We appreciate the EC giving importance to challenges stemming from quantum computing that will pose a threat for the security of digital infrastructures. However, what the White Paper describes as scenarios in the very distant future are already a reality today. The EU can therefore not afford to delay measures any further.

As correctly reported, quantum security can be achieved with two different approaches: Quantum Key Distribution (QKD) and Post-Quantum Cryptography (PQC). These should not be considered as alternatives to one another, but as complementary. PQC, which is a mathematical approach, does not ensure the so-called 'unconditional security': despite efforts to strengthen the algorithm, it remains susceptible to eventual decryption by advanced computational capabilities. Focusing exclusively on PQC would entail a perpetual race not to be cracked by adversarial attacks, akin to a 'cat and mouse game'.

On the contrary, QKD takes advantage of the properties of quantum mechanics that, by nature, is the most effective solution to face the threats of today and tomorrow. QKD is currently at technology readiness level (TRL) 9, and there are QKD systems commercially available on the European market. Not prioritizing the development of an EU ecosystem for QKD will leave room for other countries, especially Asian countries, to become global market leaders. This will lead to a limited role for the EU, which has all the necessary know-how and technologies to become a major global player in this field.

[64] ETNO, "Cyber Security Rating – a rising challenge for EU industries", 2021

4) Towards security and resilience of submarine cable infrastructures

We welcome the EC's Recommendation on the security and resilience of submarine cable infrastructures and the proposed measures to strengthen EU-wide coordination among Member States in the deployment, security, and governance of crucial cable connections.

Diversity in submarine cable systems is crucial for bolstering the resilience of Europe's gateway to the global internet. We strongly advocate for the continued support of the EU's capabilities in submarine cable connectivity from the EU's Connecting Europe Facility (CEF) Digital program, which should be prioritized for refinancing in the next mandate. The goal should be to bolster the competitiveness and relevance of European players in strategic routes and in the components and technological industry compared to non-EU investors. The CEF Digital program could also contribute to reinvesting in critical cables at the end of their lifecycle. Finally, EU funding should address the significant challenge of monitoring the seabed, particularly in areas inaccessible to operators.

Therefore, we support the establishment of a list of Cable Projects of European Interest (CPEIs) that are strategic to Europe's security, resilience, and sovereignty. The deliberations to identify the CPEI list within the newly created Submarine Cable Infrastructure informal Expert Group should involve European cable investors and operators that have first-hand market and technical knowledge. The Expert Group should thus encompass a mechanism to systematically consult industry stakeholders and involve them in decision-making as appropriate.

A joint EU collaboration, particularly concerning permits, would be key to ensuring a coordinated and consistent approach across jurisdictions. Permitting processes for submarine cables currently face significant challenges, characterized by heterogeneity, a lack of a unified information point, and excessive bureaucratic hurdles. The resulting slowness and difficulties in the permitting process not only impact initial installations but also hinder the timely repair of any issues, leading to consequential delays that compromise the security and resilience of submarine cable networks.

We strongly advocate for comprehensive reforms in the permitting procedures. This includes clear identification, simplification, and unification of the process for installation, repair, and decommissioning of submarine cables. These processes should be harmonized throughout Member States as much as possible. The introduction of a one-stop-shop in every country, as indicated by the Commission's recommendation, would be an important first step in this direction.

Finally, while the White Paper rightly suggests that adequate attention should be given to the physical security of undersea cables, we note that no specific scenario or action by the EU institutions is mentioned in this respect. This is regrettable, since the main menace to undersea cables' resilience is not digital but physical.

5) High-level recommendations pillar III

- [Regulatory Framework] Leverage the implementation of the new security framework for products and services to truly harmonize European and national security requirements

across the single market. Close the regulatory gaps where needed, for instance, with respect to cybersecurity ratings.

- [Quantum Technologies] Consider QKD and PQC as complementary and prioritize the development of an EU ecosystem for QKD to assert leadership in the global technological race on quantum technology.

- [Submarine Cable Competitiveness & Innovation] To enhance the competitiveness and autonomy of the EU connectivity market, address the shortage of EU manufacturers of optic fibre cable components and technology. Public support is needed to develop a robust industry and diversify providers of cabling supplies. Additionally, to boost resilience and security, focus on technologies that enable faster repairs of submarine cables and sensing technologies that protect cables from natural and man-made hazards.

- [Submarine Cable Funding] Develop a list of CPEIs together with the EU stakeholders, and support the EU cable industry, particularly by addressing market failures through projects that lay new cable routes and enhance existing infrastructures. Prioritize funding to maintain and enhance the EU manufacturing industry and capable repair fleets. Define strategic projects collaboratively between public and private actors. Increase the budget allocated to the CEF program instead of creating new mechanisms like an equity fund. Stability in funding processes facilitates the submission of complex submarine cable projects. Additionally, address the shortcomings of the Global Gateway initiative by streamlining grant delivery and ensuring satisfactory returns on investment for projects.

- [Submarine Cable Governance] Establish a pragmatic joint EU governance system for submarine cables together with EU stakeholders that looks into best practices and projects mutualisation, across all cable networks at the EU level. Clarify whether submarine cables are considered publicly available networks and ensure the EU labelling system mentioned by the EC covers cable networks qualified as ECN.

- [Submarine Cable Security] Harmonize security requirements for both the manufacturing and operation of undersea cables with international partners to bolster resilience and security globally. Collaborate with like-minded nations to establish common criteria for a global labelling system of ‘trusted suppliers’ in undersea cable manufacturing and operation. Implementing a standard set of infrastructure protection measures would alleviate regulatory burdens and operating costs for operators, fostering international industry growth. Ensure that national governments assume responsibility for ensuring cable physical integrity and expedite collaboration between administrations and operators to enhance repair capabilities during incidents. Consider the work done in existing international fora like ESCA (European Subsea Cables Association) and ICPC (International

Cable Protection Committee) to facilitate better cooperation.

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