GSMA

Mobile Industry Response to European Commission White Paper: *How to master Europe's digital infrastructure needs?*

June 2024

GSMA

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Introductory Comments

The European members of the GSMA welcome the European Commission white paper, *How to master Europe's digital infrastructure needs?*, which clearly recognises the problems faced by Europe's telecoms sector and offers a range of possible scenarios to address them.

The focus of the white paper on the strategic and critical role of digital connectivity in the wider European economy is much appreciated. In our view, this is a fundamental premise for an overhaul of different pillars of the regulatory framework to support necessary investment in connectivity infrastructure to meet Europe's Digital Decade targets, boost European innovation and competitiveness and keep pace with other leading economies.

By now, there is broad recognition across stakeholder groups that connectivity is the backbone of a competitive digital and green economy.[1] As was recently stated in the report by Enrico Letta, *"In the global landscape, digital technologies drive industrial productivity and citizen well-being. A healthy and secure electronic communication sector is crucial for the green transition, innovation, and resilience of the Union, especially in terms of cybersecurity".* Europe's competitiveness is closely linked to the state of digital connectivity infrastructure as the basis for economic growth, prosperity and the ability to create advanced solutions that benefit Europe, e.g., in education, healthcare, transport and environment.

The Commission rightly emphasises the poor financial health of Europe's telecoms sector, which currently faces a large investment gap to meet the Digital Decade Targets, and the lack of attractiveness to investors stemming from declining profitability, low average revenue per user (ARPU)[2], fragmentation and lack of assets with sufficient scale. Unless urgent action is taken, according to the European Commission's 2023 report on the state of the Digital Decade, the EU will not meet its connectivity targets in time.

Our sector faces unprecedented and systemic challenges in rolling out the infrastructure necessary to meet these targets. Revising spectrum policy, accepting the need for scale to avoid market fragmentation, embedding fairness in the value chain to speed the rollout of next generation networks, and updating telecoms regulation to reflect convergence and competitive market dynamics should form the basis of a new approach. We are encouraged to see that these elements feature prominently in the text of the Commission's white paper.

As Europe has entered a new geopolitical era characterised by increased polarisation, trade barriers, emerging conflicts and a global tech race, cutting-edge digital networks, cloud computing and AI become the determining factors for economic security and competitiveness. Against this background, we are encouraged by the Commission's considerations to widening the objectives of the regulatory framework. To address industrial competitiveness, economic security and sustainability.

The white paper aptly describes the acute challenges facing the telecommunications sector, and the GSMA is now calling for urgent action in the form of clear and practical solutions, and a reset in the

[1] TTE Council meeting, 5 December 2023, https://www.consilium.europa.eu/en/meetings/tte/2023/12/05/
[2] ETNO State of Digital Communications, 2024

regulatory environment. The scale of ambition for reforms should be increased to match the scale of the problems identified.

We believe there is a critical need for swift action in the following areas:

1. **Launch initiatives that enable European telecom operators to build scale by allowing in-market consolidation.** Scale is critical to foster the significant investment needed to deliver better outcomes for European consumers, ensure that European telecom operators remain independent and financially secure, and ensure that technological challenges can be addressed. In addition, addressing barriers to the single market could unlock cross-border efficiencies that might foster cross-border consolidation in the long term.

2. **Rebalance the digital ecosystem by ensuring equivalent rules for all service providers, levelling the playing field and promoting healthy competition across the digital value chain.** The lack of a single market for telcos is exacerbated by the competitive imbalance this creates between 'traditional' telcos and other players (such as OTT communications service providers, CDN operators or cloud service providers). Despite providing equivalent or complementary services, these other players are *not* subject to the plethora of rules that telcos face, or they already benefit from frameworks centred on higher levels of harmonisation and/or truly effective 'country of origin' principles. In effect, this has enabled them to easily scale up and deploy services across Europe.

3. **Re-evaluate the existing regulatory framework that was conceived 20-30 years ago, and update the policy objectives and principles to match today's market realities and challenges.** Continued fragmentation in the application of 'telco' and adjacent regulations across the Member States has prevented operators from being able to take advantage of scale at the network or service layer. For example, it has not been possible to take advantage of the continued evolution in network technology to develop a centrally controlled single core network due to fragmented rules, for example, strict localisation rules in relation to facilitating law enforcement obligations which would need to be addressed before a country of origin principle can be effectively applied.

4. **Establish a pro-investment approach to EU spectrum policy, including adoption of best practices to achieve a more predictable and harmonised approach to spectrum auctions, licensing costs, prolongation of licences and identification of future bands.** The very high auction costs for mobile spectrum in Europe have consistently extracted funds from the sector which could have been used for investment. By October 2023, European operators had spent a total of €26 billion at spectrum auctions for the 5G pioneer bands.[3] This was not a one-off, but adds to the debt burden that built up from the 3G and subsequent 4G auctions. A more pro-investment approach to EU spectrum policy will be a key driver of Europe's connectivity goals. Effective spectrum policy can support strong and sustainable economic growth and ensure 5G for all European citizens and businesses by the end of the decade.

5. **Enhance data efficiency through relevant economic signals for bandwith usage and via efficient codecs and data saving mode by default, and extend circular economy principles to network equipment and the EU taxonomy for green investment in electronic communication networks,**

[3] The State of Digital Communications 2024, ETNO, January 2024

based on robust metrics. The mobile industry is committed to reducing its own emissions, and it is making a significant contribution to combating climate change through reducing the emissions of wider industries through smart connected technologies. By increasing connectivity, improving efficiency and impacting consumers' behaviour, mobile-network-enabled technologies are helping to reduce emissions. This 'enablement effect', however, requires a number of further policy actions to show its full potential, first of all helping the operators address the energy challenge and including telco networks in the scope of EU taxonomy.

We underline that there is an urgent need for action. Not only are technologies and market dynamics evolving rapidly, but the European telecommunications sector is not currently in a financial state to deliver the Digital Decade targets on time. These challenges need to be addressed by a swift reform that should happen before the EECC review takes place – otherwise, the Digital Targets 2030 will not be reached.

The consequences of missing the Digital Decade targets go far beyond the digital sector and could lead to lost opportunities and unrealised innovations in, for example, smart manufacturing, advanced healthcare services and smart mobility. High priority should therefore be given by the Commission to a legislative proposal, such as a Digital Networks Act, that addresses these challenges at an early stage in the new mandate.

Below, we provide our analysis of the Commission's proposed scenarios in the white paper and our recommendations on how to complete the European digital single market.

Pillar I: Creating the "3C Network"

The GSMA welcomes the Commission's industrial-policy approach to expanding Europe's technological capacity, and we support the idea of public-private collaboration to foster a community of innovators working on the connected-collaborative-computing (3C) network. Mobilising a variety of stakeholders from the connectivity ecosystem to develop large-scale pilots is a prerequisite to building up digital innovation in Europe while using resources and skills efficiently.

We welcome the Commission's focus on funding opportunities, in particular to streamline funding initiatives (i.e., a one-stop shop) which could also serve as a way to help programmes run more efficiently and remove bureaucracy. For example, a more efficient approval process for IPCEI is desirable. While EU funding is important, unleashing more private sector investment into connectivity and cloud solutions will require significant regulatory reforms, including in important areas such as spectrum and competition, as detailed below.

Looking to the future, the convergence of technologies such as AI and big data, blockchain, edge computing, virtual and augmented reality and advanced mobile networks present an opportunity for the complete transformation of the digital sphere. This will profoundly reshape the telecom sector. Telcos will transform into future-facing technology communications companies, a shift that will drive further innovation across several layers of the value chain, demand further digitalisation of telecom networks and reposition the industry within the broader internet ecosystem.

The GSMA community is currently focused on creating an open, network-as-a-service environment to integrate the service portfolio (i.e., connectivity, 5G, IoT, cloud) and enable seamless connectivity for immersive technologies. This approach will deliver, through application programming interfaces

(APIs), various connectivity options for developers in different sectors who are improving their business processes and building new digital services — powering the next wave of innovation.

New technologies and innovation feature prominently throughout the white paper, and we appreciate that. As a general comment, however, it should be kept in mind that each mobile generation faces a years-long journey from deployment to scale to investment returns through new market propositions and the exploitation of new network capabilities by application developers and enterprises. As such, 5G technology is expected to be the prevailing technology in the period towards 2030.

Today, mobile operators are still spending heavily on 5G deployment. Although consumer adoption has been fast, monetisation of 5G remains a challenge. Boosting service innovation and ecosystem enablement and evolution (e.g., interoperable networks and services) is therefore an area that in our view deserves particular attention — instead of focussing exclusively on 6G.

In the context of evolution and innovation, it is essential to promote enhanced interoperability, open standards and open-source solutions. This approach will foster innovation and facilitate adaptation to new technologies. This should come together with enhanced EU involvement in international standardisation and normalisation processes. We consider an increased role of the EU in standardisation bodies to be of utmost importance — to ensure the development of open solutions and avoid lock-in effects with the emergence of proprietary and non-EU dominant solutions.

In addition to the large-scale pilots suggested under Pillar I, we ask the Commission to adopt a more forward-looking approach and support the Open RAN evolution. Open and disaggregated network architectures provide operators with greater flexibility in selecting and optimising network components and services while reducing dependency on a very limited number of network vendors, thereby stabilising network equipment supply chains. Open RAN also has the potential to drive competition, leading to new entrants, greater innovation and flexibility in deployment, all of which will contribute to greater resilience of the mobile sector.

Governments outside of the EU (e.g., United States, United Kingdom, Japan) are actively supporting and funding Open RAN (e.g., NTIA funding in the US) to speed its growth and to attract companies as part of a new ecosystem. The lack of a common approach to Open RAN in Europe is a disadvantage, and we therefore propose a new scenario in the paper dedicated to Open RAN, which would include:

- Strategic, political and financial support for a coherent Open RAN approach in the EU that looks at the end-to-end integration of different components — both on the hardware and software side, specifically systems integration, network automation and integration of AI, and cloud. This would help to build a relevant EU ecosystem, also relying on incumbent network equipment vendors.
- Allocation of dedicated funding to trusted EU Open Labs, hosted by European MNOs, for the validation and certification of Open RAN systems integration. This would allow the industrialisation of a pan-European framework to certify Open RAN configurations in line with European operators' choice of vendors and configurations. A consortium of EU-funded Open Labs would avoid fragmentation and test duplications, while ensuring privileged access to test facilities for local vendors.

For technology rollout, funding for research and development will continue to be crucial, first of all through IPCEI's. The focus should be on supporting the transition of technology from research stage into the go-to-market stage, supporting also the deployment of privately developed technologies. IPCEI focused on infrastructure should be instrumental in such funding, enabling the necessary scale.

We also call for consideration of other incentives, such as financial and tax[4] ones. This, together with making the IPCEI's less bureaucratic and complex and more speedy, especially in the stages between announcement of the programme to the notification of the funding decisions, will contribute to simplicity and speed of the industrial policy measures.

Additionally, we see a need for better coordination of the funding activities by EU and Member States, preferably with a single governance and a single information point for various funding opportunities relevant for digital, such as Multi-Country Projects, the Connecting Europe Facility, Horizon Europe and Digital Europe programs. This more integrated approach would deliver significant synergies.

Telco Cloud requires an approach distinct from Edge Cloud. The purpose of Telco Clouds is distinct from the Edge Cloud in the sense that it is a specialised cloud computing environment, developed to accommodate and optimise the working of telecom network technology, for example to support backbone networks. Its role in future telecom innovation will be critical, as it is expected to underpin future developments not only of 5G but also of 6G and Open RAN.

Its key function will be to support the dynamic allocation of resources and virtualisation of network functions, enabling innovative services and applications that require robust, scalable and agile network capabilities. One of the key consequences is the need for a high degree of customisation and specialisation compared to conventional cloud solutions. In summary, Telco Cloud goes beyond being merely a new platform. Its is a catalyst for transformation within the telecommunications sector, addressing the upcoming connectivity demands. For the above reasons, we do not expect Telco Clouds to function in parallel as a customer Edge Cloud, due to the high degree of customisation and specialisation of the former.

Sufficient importance should be placed particularly on the federation of various software solutions. The choice for a single Telco Cloud stack should not be determined politically. Interoperability among various industry solutions, including the interoperability between various layers, should be prioritised instead. This approach would enable the market to determine the most viable solutions while achieving the necessary scale.

Specifically for network cloudification, specialised, secure and sufficiently capable infrastructure is required to address the specific requirements and challenges of telecommunications. However, this also raises questions regarding the applicability of existing legislation such as the Data Act. While the Data Act aims to facilitate cloud switching and interoperability, it remains unclear whether it will have any meaningful impact on Telco Cloud solutions due to their customised nature.

[4] For comparison, success of the Inflation Reduction Act in the US is, among other factors, based on fact that it introduces tax incentives, transprent and significantly more easy to implement than stat aid-based incentives.

Pillar II: Completing the Digital Single Market, Scenarios 4 and 6

Scenario 4: *Addressing the converged electronic communications connectivity and services sector … [by] broadening the scope and objectives of the current regulatory framework to ensure a regulatory level playing field and equivalent rights and obligations for all actors and end users of digital networks where appropriate to meet the corresponding regulatory objectives.*

Scenario 6: *In order to facilitate the single market and building scale for activities of all players, the Commission may consider … a more harmonised approach to authorisation (through the possible establishment of a 'country of origin' principle for certain activities less connected to consumer retail markets and local access networks.*

Context

The EU's regulatory framework for 'telecommunications' has evolved significantly over the years, from initial liberalisation through to the current framework, primarily defined by the European Electronic Communications Code (EECC or Code). These evolutions have had a number of goals, including harmonising the rules to create a 'telco single market', and addressing technological and market shifts occurring in the sector. These goals, however, have not yet been achieved.

First, the EECC remains a Directive and is subject to delays in transposition and variations in how it is interpreted and implemented nationally. Furthermore, telcos remain subject to a range of non-sector-specific obligations, such as those in areas of law enforcement and security, which are inherently national in their implementation.

Second, the communications sector has undergone profound changes in recent years, and will continue its technological transformation, with new technologies and use cases having a 'delayering' effect on what was once an integrated telco value chain. This has opened up use cases such as NaaS, Open RAN and Open APIs, supported by edge cloud, quantum encryption and AI. These developments will facilitate new and secure network and customised business services and applications to enhance productivity, foster economic growth, accelerate the green transition and further embed connectivity into every aspect of daily life.

However, while vertically integrated telcos continue to play a critical role in the electronic communications ecosystem, the delayering set out above has allowed a range of new players to enter at various points in the value chain, offering equivalent and competing (e.g., OTT messaging and voice services) or complementary (e.g., software to support network cloudification, CDNs) services. Despite playing an increasing role in the electronic communications sector, these players are not regulated in the same way.

The problem

As a consequence, there is neither a telecom single market nor a regulatory level playing field. This creates a number of risks.

First, services consumers consider to be functionally equivalent are subject to different consumer protection rules, thereby creating confusion among end users.

Second, it limits the ability of parties to compete fairly. This can play out in a number of ways. For example, there is a clear competitive disadvantage in the development and deployment of

innovative and value-creating services if one group of players is subject to complex and costly regulatory obligations and the other is not. Furthermore, if certain players, such as cloud service providers, provide increasingly critical components of network infrastructure, yet are not subject to 'network-based' regulation, they will gain significantly greater bargaining power, enabling them to impose unfair conditions.

This unlevel playing field is evidenced by the extreme disparity in fortunes between European telcos (which have suffered years of continuous downward ARPU pressure, and ROCE lower than WACC for over a decade) and the small number of big tech firms, which have been able to use this inconsistent regulatory system to their advantage, scaling up to become serious players in a number of levels of the communications value chain. The pattern that our industry has been facing with OTT messaging services is consequently repeating itself in the context of 'network-based regulation'.

We provide in the annex a list of areas of regulation where we see these two aspects of fragmentation highlighted above.

In combination, these issues have played a significant role in the downward trend in the economic health of Europe's telco sector. This is despite the best efforts of our industry to address these problems through, for example, rightsizing their business by exiting markets where it made sense to do so, spinning off valuable assets such as netcos or towercos mainly to decrease debt, and pursuing scale wherever possible.

However, it is not enough. Absent meaningful reforms, investment in next-generation network infrastructure and innovation that is vital for Europe's future competitiveness remains at risk. Additional disvestment by operators could further erode Europe's strategic autonomy.

The solution

The white paper presents high-level suggestions on how these issues could be addressed, including in Scenarios 4 and 6:

- Broadening the scope and objectives of the regulatory framework to ensure a level playing field
- Harmonising the approach to authorisations, including possibly introducing a country of origin principle for activities such as core networks and core network services (Note: Spectrum is dealt with in a separate section.)

We welcome the broad thinking and would ask that the European Commission continue to consider options to address this issue in its next mandate. In particular, we call on the Commission to focus on updating the EECC and introducing a new Digital Networks Act as early as possible under the new mandate.

We believe more consideration is needed as to how, exactly, these issues should be addressed as part of these reforms. In particular, we would welcome an assessment of the following:

Addressing technological developments. As noted above, a number of technological developments mean that certain players (e.g., cloud service providers, CDN operators, submarine cable players) play an increasingly important role in the virtualisation and privatisation of (global) network infrastructure, and with CSPs providing inputs crucial for network evolution[5]. Similarly, others have entered the same markets as telcos and provide clearly competing services (e.g., OTT communication services). Yet they either remain outside the scope of the broad regulatory framework for digital and communications networks — for example, the DMA is based on the

[5] See also BEREC's Report on Cloud and Edge Computing Services (2024), e.g., chapter 6

"gatekeeper" notion — or are subject to a different level of regulation, e.g., in comparison to the EECC and the OIR. To address this, two routes could be considered.

- First, an assessment of whether the current definitions under the EECC remain fit for purpose and consideration of an update to ensure analogous services are covered by equivalent rules
- Second, an assessment of whether some of the core principles of the telecommunications rule book (e.g., access, interconnection and portability) should be applied to other aspects of the communications value chain that are currently free from such obligations

We also highlight that the Commission made great strides in its last mandate in introducing several digital regulatory frameworks including the DMA, the DSA, the Data Act and the AI Act. These are designed to help promote technology development and adoption in the EU, encourage competition and address regulatory gaps. However, as these are in the early stages of implementation, it is not yet clear to what extent they will level the regulatory playing field. For example, in the context of cloud services, while the DMA in principle could be applied to cloud service providers with 'gatekeeper' status, no provider has so far been designated, meaning the DMA cannot be used as a tool to address the issues identified above. Similarly, the Data Act includes provisions to support the interoperability of cloud infrastructure, and the ability to swap between cloud providers. It is not yet clear, however, how this could be applied in the context of network cloudification/virtualisation software. We therefore call upon the Commission to ensure these new frameworks are implemented effectively, including by providing further clear implementation guidance on how they can be applied in these developing areas.

A regulation that currently limits the creation of innovative European digital services and puts ECS providers at a disadvantage compared to other players is the e-Privacy Directive. The e-Privacy Directive imposes limitations on the adoption by ECS provider of anti-fraud measures that would protect our customers from impersonation fraud, and which are also being discussed in the context of the Payment Service Regulation currently in negotiation process at the EU level. Network operators would currently require an exemption at (each) Member State level, as already foreseen int the e-Privacy Directive itself, more precisely for the application of Articles 5, 6 and 9 on the basis of preventing illegal activities. The fragmented implementation has so far created delays and legal uncertainty that ultimately hinders innovation on anti-fraud techniques and negatively impacts end users.

Several of the application programming interfaces (APIs) that could be provided via the Network as a Service (NaaS) model could face critical operational challenges. An example of this is the case of the API for authentication exposed within the Open Gateway initiative led by the mobile industry. A strict interpretation of the e-Privacy Directive by the data protection authorities could require explicit consent as an independent act when using the client IP address for authentication purposes in order to provide access to the service, thus voiding the security advantages for users of a IP based authentication, alerting scammers, worsening consent fatigue and, in general, destroying the business case, just due to a formalism. This would only imply an unjustified regulatory and technological asymmetry not applicable in other contexts using IP-based authentication, like the eEvidence Regulation or authentication based on cookies, and may jeopardize the initiative, which would not be able to play the foundational role envisaged for achieving a fully virtualised and

cloudified network environment, with its possible impact on a Digital Single Market as a facilitator of the provision of pan-European services.

While the EC should consider a permanent solution for the challenges faced by ECS providers to innovate resulting from the ePrivacy Directive, the industry needs a swift solution in the form of guidelines to tackle the challenges outlined in the above examples in the short term. The limitations faced by the industry have a direct impact on initiatives such as Open Gateway that cannot wait for a long term solution.

Achieving greater harmonisation, removing barriers to the single market. Telcos could improve efficiencies in the long term, were they able to develop and deploy certain services on a cross-border or even pan-EU basis. However, the deployment of such services or centralised core networks is currently blocked due to largely fragmented regulations, such as those outlined in the annex.

Consequently, we support the intention of the European Commission to explore further how these efficiencies and scale could be achieved. For example, we welcome the Commission considering this topic in its white paper, and the thinking behind the country-of-origin principle that is suggested. Similarly, we believe the ideas put forward in Enrico Letta's subsequent paper, which proposes the creation of a centralised EU governance model for pan-EU networks and services, deserves exploration.

However, developing and applying these principles in the communications sector context would require careful consideration, as there is uncertainty regarding how, exactly, any 'country of origin' principle or two-tier regulatory framework as suggested in Letta's paper could be applied in practice. If done incorrectly, it could lead to a 'race to the bottom' (as we have seen in relation to GDPR enforcement) or confusion over who has authority over complex regulatory issues such as numbering plans.

For example, while we welcome the Commission's approach to finding ways to promote the development of cross-border services, we see a number of potential pitfalls that would need to be carefully worked through, including:

- If the country-of-origin principle is applied to the General Authorisation *notification* regime itself, then although this would help streamline notification processes, it would not address the fact that the authorisation then enables national authorities to apply a range of obligations that are typically applied, in a fragmented manner, at the local level (for example, access to spectrum, numbering resource, law enforcement obligations).
- If we are to assume that the country-of-origin approach would apply also to these obligations (e.g., the operator would only need to comply with the rules from the country in which they are headquartered, even where providing certain cross-border or pan-EU services), this may throw up certain challenges. For now, a number of the obligations that may be attached to a General Authorisation (such as the ability of national authorities to require lawful intercept) remain inherently national and furthermore sit outside of the telecommunications regulatory framework itself. Therefore, how these obligations may need to evolve in order to fit into this concept would need to be thought through.

- The white paper refers to applying this concept only to certain types of networks or services (e.g., core network services), but as of now it remains unclear who would be captured under this definition and which of their services would be covered. For example, would this include the expansion of this concept to other 'non-telco' players that now play a key role in the deployment of network resources? And if so, how can it be ensured that there are no competitive distortions between those different types of players?

In addressing these questions, it will need to be assessed whether such an approach ultimately addresses the fragmentation that is preventing the existence of a telco single market and the creation of a level regulatory playing field.

It would also be helpful to time this transition to a new regulatory framework in a way that supports the transition to the next generation of digital networks. This is because, as it stands, European telco operators have designed their networks to manage the different and complex obligations that apply at Member State level. It will be very challenging (indeed, even economically unfeasible) to rearchitect these fully to take advantage of any new country-of-origin principles in the short term: any such shift would come with technology refreshes in the coming years. For European mobile operators, the potential benefits from a country-of-origin authorisation for core networks may therefore be less impactful until after a new generation of technology is implemented.

In addition to potential new governance models, there are areas of the regulatory framework where further action could be taken to encourage harmonisation, as outlined in the annex.

The Commission should consider how to encourage further harmonisation, for example through:

- Further streamlining the general authorisation and notification regime, ensuring more hamonisation of rules applied to operators including on consumer law, security provisions (see below); and
- Issuing further implementation guidance on best practice implementation of certain regulatory measures, and encouraging member state authorities to follow this.

Enabling scaled-up business services. The EECC recognises that larger enterprises constitute a specific category of customer, distinct from consumers and SMEs.[6]

However, the EECC is not consistent in its application of this principle nor is the principle applied in a harmonised way across the EU. In the operative part of the Directive, there is no specific definition of 'larger enterprises', and there is no operative provision that actually specifies that services offered to larger enterprises are to be exempted from consumer protection provisions. As such, services to larger enterprises arguably remain subject to the same consumer protection provisions that apply to individual citizens, SMEs and nonprofits, even though they are governed by bilaterally negotiated contracts. In practice, this causes confusion on the part of operators and can result in redundant or

[6] In Recital 259, the EECC states that "The bargaining position of [microenterprises, small enterprises and not-for-profit organisations] is comparable to that of consumers and they should therefore benefit from the same level of protection unless they explicitly waive those rights … larger enterprises usually have stronger bargaining power and do, therefore, not depend on the same contractual information requirements as consumers."

unpracticable obligations. This impacts operator's ability to scale up business services and, in particular, hampers efforts to offer cross-border services (as set out in detail in the annex).

The Italian authority AGCOM acknowledged and addressed the peculiarity of this situation in December 2023, when it confirmed that services offered to larger enterprises are to be excluded from the scope of its consumer protection Resolution 307/23/CONS. The GSMA believes that this acknowledgement should be made explicit at EU level via clearer articulation in the regulatory framework, which should then be adopted by all Member States.

Streamlining regulation. While we recognise that certain rules remain inherently national in character, we would welcome a detailed assessment of how to further streamline certain areas of e.g., consumer protection rules and the telco regulatory framework. This would support not only the provision of services across Member States, but also the development and deployment of national consumer services and other processes, which currently must be designed on a per-market basis.

Without dealy, it should be considered whether any of these rules need to sit in sector-specific legislation, or whether it would make sense to remove them where justified in light of existing horizontal legislation. A key example is in relation to consumer protection rules, which have been layered with numerous EU-wide directives providing room for Member States to further tweak at national level. A reduction and simplification of EU-wide consumer protection measures, e.g., by removing those which are obsolete or where horizontal frameworks such as the Consumer Rights Directive suffice, should therefore be considered.

We appreciate that each of these options comes with trade-offs that would need to be carefully considered as part of the review process. We remain fully open to working with the Commission to assess this in the next mandate.

The white paper rightly acknowledges the importance of obstacles to the single market stemming from, for example, national security legislation, and suggests ways that would facilitate the relevant authorities of Member States to align on the applicable security conditions, thereby removing barriers. While the Commission may have no legal basis to use legislative measures here, it can encourage dialogue between Member States in the framework of security cooperation with the intention of finding workable solutions.

The white paper also rightly identifies the growing importance of cybersecurity and resilience given the increasingly unstable geopolitical context. It is important to note, as highlighted by the 6 May Council conclusions on the future of cybersecurity, that the EU can already rely on a large number of existing cybersecurity rules, both horizontal and sector-specific. The last TTE Council conclusions on the future of cybersecurity from 21 May also called for a mapping of rules to identify duplication and overlaps, and focus on the implementation and enforcement of existing rules.

Open Internet Regulation

The aim of the Open Internet Regulation is to ensure the "functioning of the internet ecosystem as an engine of innovation" in Europe and to protect end users from the actions of those identified at the time as 'gatekeepers' in the digital ecosystem – the internet service providers.

This aim is well understood, and telco operators stand behind the protection of users' rights with respect to the openness of the internet, and we therefore reiterate as an industry our commitment to ensuring that the internet remains open, with all end users able to access and share legal content of their choice without restriction.

However, with the technological evolution over the past decade leading to significant commercial and structural changes in the digital ecosystem, the legitimate aims of the regulation are no longer delivered under the current rules.

Now is therefore the right time for the European Commission to provide more clarity on the interpretation and application of the Open Internet Regulation in the context of developments including the following:

New digital use cases. For instance, operators are enhancing their networks to support advanced 5G capabilities such as network slicing and high-speed, low-latency technologies. This includes transitioning towards more flexible, software-based networks that can offer on-demand connectivity (i.e., NaaS) at the quality required by specific applications and services, via developments such as network APIs. However, these types of services, which offer a far more symbiotic relationship between content and connectivity, sit at odds with the core principle of 'equal treatment of traffic' enshrined in the open internet rules, and it is very difficult to navigate the narrow exceptions to this rule, such as the 'specialised services regime'.

Network management techniques. New network technologies are enabling more efficient traffic management, which could mitigate the impact of rising traffic volumes without necessitating network expansion. However, many of these do not sit comfortably within the conditions for compliant traffic management. An example would be 'L4S' which would allow content providers to 'mark' their packets if they require low-latency, which would facilitate a more effective queuing system for traffic.

Regulatory asymmetry. The current framework does not apply to the true gatekeepers of the digital ecosystem: the largest platform operators. On the contrary, they are equated with end-users, as deserving the same level of protection, while these players have significantly more scope to shape the internet experience of end-users, as they seek to exert increasing control over the quality of experience for end-users, via solutions at an application, device or software level. For example, there has been a considerable expansion in recent years in the volume of data being conveyed over private networks, in particular the use of CDN services (proprietary or commercial). These CDN providers are able to influence the quality of content that end users experience, and can differentiate prices based on the quality of service they offer to content providers. They also apply traffic management techniques such as load balancing and prioritising certain traffic (e.g., live streaming) in a way ISPs cannot, due to the rigid application of the OIR rules.

As a consequence of the legal uncertainty, operators hesitate to invest in new solutions or deploying new technologies that might later be considered contrary to OIR which has negative impact on innovation. This was clearly exemplified by the European Court of Justice's 2020 decision that found

zero-rating practices to be contrary to OIR, despite this being years of settled practice, that were popular with and benefited consumers.

Additionally, different Member States and regulatory authorities may interpret the Open Internet rules differently, which creates uncertainty, especially regarding innovative technologies such as 5G network slicing. If a finding of noncompliance is made in one Member State, it may trigger a domino effect of other Member States coming to the same conclusion, or it may result in a service being compliant in one Member State, but not in another.

Such uncertainty can lead to slower adoption of new digital services and dissatisfaction among users. Without the ability to develop these services, operators struggle to profit from their network investments, limiting their capacity to invest in future upgrades. We see this as a vicious circle.

To address these issues, we propose the Commission take the following actions:

We propose that the Commission urgently issue a Recommendation[7] laying out how the current framework is to be interpreted and applied to the new and developing use cases, in particular 5G network slicing and innovative traffic management techniques. This will give operators the legal certainty to develop and deploy innovative services based on these new and developing technologies. The Recommendation could include a nonexhaustive list of use cases that are assumed to comply with the Open Internet Regulation.

However, in consideration of the critical changes in the digital ecosystem outlined above, we call on the Commission to ensure that the key principles of ensuring openness in the internet ecosystem are expanded to a broader scope of players that have a critical role in the deployment and delivery of content. This would ensure that the aims of the regulation to protect end users are consistently upheld by all players in the value chain.

Enhanced Fairness in the Value Chain (Dispute Mechanism)

We welcome the the Commission's considerations of policy measures to ensure swift resolution of eventual disputes in commercial negotiations between parties in the IP-IC market.

Context

Since the 2000s, the internet has evolved from a user-centric communications network to a transport infrastructure for the consumption of an ever-expanding range of media and content. Today, approximately 70 percent[8] of the data transported through backbone networks to consumers is generated by just a few large CAPs including Google, Meta, Amazon, Microsoft and Netflix. These companies have developed their own global networks and infrastructure — data centres, subsea- and fibre-optic cables, content delivery networks (CDNs) — to deliver their services and content more efficiently in support of their own business models.

[7] As also concluded in the Commission's report to the European Parliament and the Council on the implementation of the open internet access provisions of Regulation (EU) 2015/2120
[8] Telegeography: The state of network report, 2023 edition

As a result, the IP interconnection regime has become more complex and diverse. Above all, it has become more concentrated, with a handful of CAPs now responsible for more than two-thirds of global mobile traffic[9]. To deliver this traffic, network operators provide a service to the CAPs by carrying the traffic to end users. The traffic stems from:

- CAPs themselves, which have become major sources and destinations of internet traffic, and which have established bilateral interconnection agreements with network operators and have built proprietary CDNs to bypass transit providers and commercial CDNs;
- Commercial CDNs, which act as intermediaries between CAPs and network operators, and which offer caching and distribution services; and
- Cloud providers, which also offer IP data transport services in addition to online services such as storage, computing and software, to CAPs and other customers, and which have built their own networks and data centres to connect with network operators and IXPs.

The problem

These developments have changed the competitive dynamics and the bargaining power between traditional network operators and large CAPs. On one hand, network operators face increasing competition at the international wholesale level.

On the other hand, network operators have become more dependent on the large CAPs, which generate most of the internet traffic and revenues, and which, in part due to regulation such as the open internet framework, have a superior negotiating position relative to network operators. In addition, this negotiating position is strengthened by the fact that they can decide to use other routes to deliver their traffic at the expense of cost and quality for the network operators and their end users.

Moreover, the large CAPs built their business models based on unlimited access to network resources offered by telcos that bear the related cost without being remunerated for the service. Without this 'free' data transport, the CAPs' business models would not be possible.

This asymmetry in negotiation power is reflected in the current commercial arrangements for IP data transport, whereby the commercial arrangements between CAPs and ISPs typically tend to zero out despite large asymmetry in traffic. This cannot be seen as a sign of a competitive market. Moreover, the lack of formal legal disputes as noted by the Commission is in our view not evidence of a lack of a challenge, but indicative of the overwhelming bargaining power of large CAPs and hence should not be taken as a sign of a well-functioning market. In fact, the number of disputes is an inadmissible measure for market evaluation. To note, a German court recently confirmed that an ISP is entitled to charge a CAP for IP data transport and that the CAP has indeed countervailing bargaining power.

The IP data transport market is expected to continue to evolve and face new challenges in the future, as data traffic volumes are projected to increase annually by 20-25% until 2030[10], driven by the growth of online services and media, as well as new technologies such as 5G, IoT and AI. In addition, we expect that new use cases related to services in the virtual world and use cases that require ultra-low latency and hence extensive re-architecting. To support these applications effectively, private

[9] Sandvine, The Global Internet Phenomena Report March 2024, Table 1
[10] ADL (2023)

peering will become increasingly important not only in the data transport layer but also at the edge layer.

The solution

Going forward, CAPs and ISPs will need to collaborate closely to ensure quality of service for customers, network stability and, not least, efficient traffic optimisation. Introducing a framework to facilitate commercial agreements in the event that they cannot be reached on a commercial basis is an essential step towards a well-functioning and sustainable internet ecosystem. Such a mechanism — which would set up a settlement-of-disputes procedure with an independent arbitrator to decide in a given timeframe — should ensure that all relevant parties including private CDNs, hosting providers and other data centres are brought into the same regulatory framework. This will also be a natural step to take from a level playing field perspective, as all players in the internet ecosystem should be subject to the same legal framework.

This could be achieved by, as indicated above, defining an obligation on CAPs to negotiate with ISPs on the terms and conditions for IP data transport services, thereby making these parties subject to a dispute resolution process in the event that agreements, subject to a fair and reasonable price, cannot be reached in a certain period of time. This obligation should be defined in the legislative process to be implemented resulting from the current consultation.

Universal Service Obligations

The GSMA believes that it is time to critically reflect on the Universal Service framework in terms of the affordability and availability criteria as well as changes in the market.

The Universal Service Regime in Europe is designed to ensure the availability and affordability of decent broadband and voice services for every citizen in Europe. Whilst a laudable goal, it has not proven effective, and the situation has developed now to the point that the current framework is no longer fit for purpose. In particular, since the implementation of universal service provisions in the EU, the market for electronic communication services to consumers has evolved significantly, providing a huge variety of offers matching the needs of consumers with those of the directive of the Universal Obligation obligations.

The current regime is therefore no longer effective, and an update is required.

On affordability, high levels of competition have meant both the introduction of competing low- or no-cost services (such as over-the-top messaging and voice communications), and (at best) constant prices for communications services despite inflation[11]. This means that universal service obligations are no longer needed to address affordability. Therefore, given the limited number of consumers who face affordability barriers in the EU, the most efficient way to support vulnerable users would be through the public welfare system, for example by introducing targeted voucher schemes.

On accessibility, European consumers with disabilities have access to a variety of offerings to communicate easily (e.g., text telephony being replaced by chat or video telephony). Therefore, more important has been the implementation of the European Electronic Communications Code, which mandated a variety of services that support persons with disabilities. The Code makes many

[11] ETNO State of Digital Communications, 2024

elements of the USO objectives superfluous. Additionally, the European Accessibility Act, which will take effect in 2025, will further enhance accessibility to services, by implementing a comprehensive approach and replacing outdated requirements from the Code.

On availability, it has also become apparent that certain network providers are carrying the financial burden in several countries, leaving others out. In any case, based on the current level of deployment and coverage of fixed, mobile and satellite networks, the designation of an operator as a universal service provider is no longer justified.

Nevertheless, there are still rural areas or new build housing areas without adequate broadband services in highly challenging coverage areas. Therefore, where the economics of private roll-out are missing, public funding should still be made available. However, this should come via Member States, or via an EU recovery style of funding, where Member States make the decision on where such funding is directed.

In sum, the Universal Service regime should only be seen as a safety net to ensure access to basic broadband services and, as its importance diminishes, it should be phased out from the future telecoms regulatory framework.

Pillar II: Completing the Digital Single Market, Scenario 5

> **Scenario 5:** *In order to address technological and market developments and the resulting need to change the regulatory paradigm and ensure less burden for companies and more efficient service delivery … the Commission may consider … a change to access policy in view of full fibre environment, by proposing a European wholesale access product….*

We agree that facilitation of pan-European service provision via less bureaucracy and a more enabling framework for cross-border networks and services is the way forward, towards a telco single market as highlighted in the previous section, and we appreciate the Commission's considerations to explore new avenues. However, based on our analysis so far, we have some concerns regarding the proposed solution about an EU-wide access product.

In Scenario 5, the Commission considers the possibility of introducing an EU-wide standardised access product as part of a reframed access framework under the assumption of a full fibre environment. In our view, the principles underpinning this proposal are unclear and we don't see the added value of this type of access product. The scope of application (i.e., symmetric or asymmetric) and which operators would be subject to this pan-EU access product also is unclear.

With VULA and bitstream offers already available across Europe, further harmonisation will provide little value to European electronic communications providers, and it would be difficult to implement, given the different architectures and network solutions implemented across the EU.

Consolidation

Introduction

In this section, the GSMA sets out its reflections on the white paper with specific regard to the role of telecom consolidation in unlocking the investment required to build the cutting-edge digital infrastructure that Europe and its citizens need.

Significant investment in infrastructure is needed to deploy new technologies such as 5G and to meet the explosive, consumer-led demand for data that 5G is expected to bring. In overly-fragmented and sub-scale telecom markets, such as the national telecom markets in the EU, a lack of scale is depriving operators of the investment case needed to unlock sufficient funding (the "investment challenge"), leading to underinvestment in the sector and blocking the benefits that Europe and European consumers would otherwise enjoy. The white paper gives credence to the investment challenge when it states that: "*[…] the current financial situation of the EU electronic communications sector raises concerns for its capacity to find funding for the substantial investments that are needed to catch up with the technological shift.*"[12]

The type of scale needed to unlock this level of investment is not scale in absolute terms (i.e., a company's total number of customers), but scale in relation to each national network deployment (i.e., the number of customers contributing to the utilisation of each network asset deployed), since it is at the local level that most traffic-driven costs are incurred. This is no different to the scale effects apparent in other asset-intensive environments, such as transport hubs or energy generation. Given a starting point where today's market formed 10-20 years ago, when levels of investment needed were much lower and revenues were growing (and actually higher), a correction can only happen, at this mature stage in the sector's lifecycle, through in-market consolidation. While cross-border consolidation can result in certain synergies (e.g., common branding and marketing, and to some extent a more efficient network core), these are insufficient to move the dial given the levels of global investment required and the degree of improvement necessary in sector return on capital. (In any event, this would require a fully integrated Digital Single Market as a prerequisite).

In the same vein, the only way to face the significant costs of network upgrade and deployment is by recovering investment costs. Return on investment depends on two variables, the number of customers in the network and the prices paid by each customer. Given the current competitive conditions and, in some markets, the regulatory obligations, operators cannot increase prices. The only way to feasibly increase ROI is by adding more users to existing networks in each specific geography to avoid network duplication and to generate efficiencies that will benefit operators and consumers.

Competition authorities in the European Union, such as the European Commission, should recognise that only in-market consolidation will allow telecom operators to rise to the investment challenge. In particular, competition authorities should place sufficient weight on the impact of in-market consolidation on nationwide investment incentives and access to investor capital when assessing mergers, and on the benefits this brings to consumers over the long term. Consolidated operators will have the scale in relation to their assets to deliver the significant levels of up-front investment required. Investment is also required so that operators can provide a better experience for European consumers, who will have access to higher capacity networks, faster and higher-quality connections, and the prospect of benefitting from lower unit service costs, as well as ensuring that the EU keeps pace with the technological advances happening elsewhere. Consolidation and the subsequent investment it facilitates positions companies to more efficiently address network resilience, customer

[12] See the white paper, page 10, which estimates that the required total investment needs for 5G connectivity alone will be over EUR 200 billion (this excludes investments beyond terrestrial connectivity such as integration in advanced satellite services).

experience and security. This is supported by several economic studies, which conclude that the in-market mergers in Europe have demonstrated (1) an increase in investment per operator, (2) better quality of products and services, and (3) no substantial increase in consumer prices.[13]

The GSMA therefore fully aligns with Enrico Letta's high-level report, "Much more than a market."[14] In achieving the ambitious goals of empowering a new Single Market and establishing a dynamic and effective European industrial policy, the imperative for scale and adequate financial resources stands out as a key tool: facilitating the growth of operators is "*imperative to achieve economies of scale and scope, enabling cost reduction and fostering innovation*". The report, fully aligned with the propositions outlined in this chapter, underscores the prioritisation of scaling-up EU companies within the Single Market. This approach not only represents an economic necessity but also serves as a strategic decision. By doing so, we prevent European markets from being dominated by large foreign corporations that may benefit from preferential treatment in their domestic markets. Through this strategy, we can bolster the Single Market dimension for electronic communications.

This need to cover the innovation-investment gap between the EU and its international competitors was also confirmed through the recent statement issued by the German and French governments, titled "A New Agenda to Boost Competitiveness and Growth in the European Union".[15] In particular, according to the statement, a revision of the current European competition rules and practices is essential to assess their suitability in contributing to the competitiveness of European companies and the EU's comparative advantage. This includes allowing the establishment of consortia and consolidation in key sectors, including the mobile network sector, to strengthen European resilience.

The Need for Sustainable Market Structures in the EU Telecoms Sector

Scale is critical to foster the significant investment needed to deliver better outcomes for European consumers, ensure that EU telecom operators remain independent and sustainable so as to attract private investment equity or overseas sovereign investors, and ensure that technological challenges can be addressed. The white paper highlights the scale of the investment needed to meet the Digital Decade targets for Gigabit Connectivity and 5G roll-out16, with the EU already behind on meeting the Digital Decade objectives in terms of take-up targets for fibre rollout and 5G coverage. At the same time, the white paper acknowledges the importance of sovereign, resilient critical infrastructure. It references the State of the Digital Decade Report, 2023, which issues a clear recommendation to Member States to boost the investments necessary for security, e.g., against cyber-attacks and digital fraud, and resilience of such infrastructures.

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[13] See Jorge Padilla, Thilo Klein, Paul Reynolds and Martin Wickens study commissioned by Vodafone UK Limited and Hutchinson 3G UK Limited on "Do four-to-three mobile mergers harm consumers?"
See Christos Genakos, Tommaso Valletti, Frank Verboven Report on "Evaluating market consolidation in mobile communications" (2018).
See GSMA Report on "Competition dynamics in mobile markets: An assessment of the effects on network investment and quality in Europe" (2022).
See GSMA Report on "Mobile market structure and performance in Europe: Lessons from the 4G era" (2020)."

[14] https://www.consilium.europa.eu/media/ny3j24sm/much-more-than-a-market-report-by-enrico-letta.pdf

[15] https://www.politico.eu/wp-content/uploads/2024/05/28/28052024_Meseberg_Agenda_EU-competitivenessgrowth-.pdf

16 See the white paper, Section 2.3.1 "Investment Needs".

Creating a secure, resilient and technologically competitive telcoms industry will require investment. The telecoms industry can only cope with these high investment needs if there is sufficient return on the investments, which in turn can only be achieved if there is enough scale in the form of additional customers on individual networks. Therefore, EU telecom operators need in-market consolidation which will also help to attract the investment required from European public capital markets to accelerate the Digital Decade objectives. The ability to invest will lead to better networks, which will bring significant benefits to European consumers and businesses in terms of access to innovative digital services and becoming more competitive with the development of new services.

The Commission recognises that — to attract the necessary financing investment from Europe's public capital markets rather than having to resort to offshore funding and the loss of national control that goes with it, described as being "*of crucial importance for the future of connectivity*" — investors require clear business cases that can demonstrate sufficient profitability and that profitability depends on the take-up of networks (i.e., scale).[17] For this, it is crucial that the focus switches from artificially introducing new entrants (via remedies or favorable auction design) to a more long-term focus on efficiencies and related investments necessary for high-speed infrastructure.

This position is very much aligned with what Enrico Letta states in the report, where it is recognised that "The *European Union needs to let network operators expand by buying national rivals to help build a real single market.*" And it continues: "*The scale of investments necessary in new technologies (for example edge/cloud, 6G, AI) implies that due consideration should be given to the necessity of some level of consolidation within national markets.*"

Only in-market consolidation can achieve the type of scale required to attract the necessary level of investment. Given that market fragmentation in the EU obstructs viable cross-border scale, only in-market consolidation can achieve the type of scale (economies of density) required to attract the necessary level of investment, since the efficiencies of a merger can only be gained at local level.

The largest investment is required for the access network (i.e., base stations and supporting infrastructure), where the economies of scale are local rather than transnational. Sufficient profitability and ROI are therefore attained by having more customers using the network assets in a specific local geography (as opposed to simply having a greater total number of customers, regardless of location). Network sharing agreements are valuable in the right circumstances and can generate certain synergies in the absence of consolidation. However, network sharing does not generate the same economies of scale as in-market consolidation. The latter involves sharing spectrum and other assets in a fully integrated network, with a single network strategy and aligned priorities. Network sharing on the other hand, does not deliver non-network efficiencies. For this reason, the type of scale that results from specifically in-market consolidation is necessary to allow optimised use of assets, spectrum and site efficiencies, which in turn lead to faster network deployment and other out-of-market efficiencies such as the green footprint.[18]

[17] See the white paper, page 11.

[18] As recognized in the recent Letta report, "The scale of investments necessary in new technologies implies that due consideration should be given to the necessity of some level of consolidation within national markets", see Enrico Letta - Much more than a market (April 2024) (europa.eu).

Once the regulatory fragmentation of the telecoms markets is overcome and we have regulatory harmonisation, this could potentially unlock synergies from cross-border consolidation. But other challenges exist in attaining cross-border efficiency, due to markets having different characteristics (e.g., orography, population density, access to ducts, etc.). For this reason, it is necessary that competition policy does not hinder needed in-market consolidation based on an incorrect expectation that cross-border consolidation could eventually result in the necessary investment conditions to deliver on the digital infrastructure needs of Europe and its citizens.

Efficiencies from cross-border consolidation will not be possible without a harmonised regulatory market. The white paper refers to the regulatory market fragmentation as the main obstacle to unlock incentives to foster cross-border consolidation and ensure a fully integrated Digital Single Market. We agree there is a need for the EU-wide introduction of regulatory simplification and best practices harmonization, not only sectoral, but in consumer protection, taxation, audio-visual, spectrum policies, permits, critical infrastructure protection, cybersecurity or data, given the efficiencies this can bring. In addition, it is necessary to remove national regulations (e.g. data localisation requirements) that prevent telcos from operating cross-border by sharing systems and platforms among operations in different Member States. This could also allow for an operator to seek to maximize such efficiencies through cross-border consolidation and integration. Ultimately however, this is not attainable in the short to medium term, and while the efficiencies would contribute towards some of the investment needs highlighted in the white paper, these alone would not be sufficient to foster the investment conditions needed to meet the Digital Decade objectives.

A long-term and forward-looking perspective is paramount to foster EU industry competitiveness, economic sustainability and sovereignty and should inform competition policy. The white paper rightly points out that the current policy framework should consider incorporating wider dimensions such as sustainability, industrial competitiveness and economic security into the policy framework. That means all policy initiatives, including competition policy, should pursue these objectives to achieve a true EU Single Market. A review of the EU Merger Regulation, which has not been reviewed for over 20 years, is key to providing a response to the new market realities and challenges that have emerged from the changes brought about by digitalisation and globalisation. This review should ensure that competition authorities are equipped to deal with the following:

- Competition authorities should be required and able to take a more long-term and forward-looking approach to mergers, with a focus on long-term investment incentives and strategies that foster EU competitiveness, with less focus on short-term price effects. In addition, it should not be assumed that in-market consolidation will lead to higher prices for consumers in the long-run. Market consolidation increases investment in efficient technology, which in the long-term could lead to lower prices for consumers.
- More weight should be granted to holistic efficiency analysis including non-price elements, i.e., factors that contribute to broader purposes and consumer benefits such as security, resilience, sovereignty and environment. In that same vein, analytical frameworks for efficiency assessment (e.g., including standard of proof and timelines) should be aligned with those of harm and remedies.

Spectrum

General comments

We welcome the Commission's recognition that artificially high spectrum prices cause roll-out delays and reduced network quality, and we are encouraged to see spectrum licensing policy reform feature prominently in the text of the white paper.

The review of EU spectrum policy is an opportunity to deliver wider adoption of best practices, as suggested in the white paper. A more consistent approach to spectrum authorisations, coupled with sufficient flexibility to deal with national circumstances, would foster efficient investments and ensure that state-of-the-art connectivity is a lever to improve welfare and the competitiveness of European businesses and citizens. However, although the text of the white paper includes many important points of analysis in relation to possible changes to EU spectrum policy, it falls short of suggesting meaningful change in the more concrete scenarios envisaged by the Commission. We therefore view the white paper as a positive trigger for discussion on more concrete actions.

The GSMA considers the following elements to be key.

- Long-term business certainty and alignment with investor timeframes through extended licensing periods, as well as early and predictable renewals across the EU, to promote long-term investment in mobile networks, following recent precedents in Spain and Germany
- A clear roadmap for timely availability of additional harmonised spectrum to accommodate the growing customer traffic demands on mobile networks across low and mid bands for which existing infrastructure can be reused, ensuring that all suitable spectrum is available and can be used from the time of assignment
- A requirement for effective prior justification through a market analysis procedure, aligned with that required for other mandated access, of any award conditions seeking to impose wholesale access regulation[19]
- Licensing processes that foster fair spectrum prices for mobile broadband and prioritise investment and coverage commitments over cash payments, avoiding artificial spectrum scarcity and poor auction design, to ensure providers and ultimately end users are not negatively impacted by monopoly rents accruing to the Public Treasury
- An institutional framework ensuring that rigorous and transparent socio-economic cost-benefit analyses are performed, at local and/or EU level[20] as appropriate, if departing from spectrum policy conventions at the allocation or assignment of spectrum or whenjustifying, *inter alia*, spectrum allocations to distinct services, set-asides for specific categories of uses (e.g., local or private networks)[21] or users (e.g., utilities, new entrants), any licence-related obligations or merger remedies

[19] Currently, some Member States use licence award rules and conditions to implement market-shaping measures with little economic justification, which in turn can result in discrimination and preferential treatment of specific market players.

[20] At EU level, the analysis should back up the harmonisation mandates and decisions.

[21] For example a new study from GSMA analysing the impact of set asides on private and public networks finds no indication that spectrum set-asides can accelerate the digitalisation of enterprises, while also finding a median set-aside amount of 100 MHz can have a substantial negative impact network quality and download speeds and therefore on consumers and enterprises using public networks. Such trade-offs need to be considered in this context.

- Increased transparency through the collection of information from national regulatory authorities on European spectrum fees and licence conditions, to ensure consistently reasonable spectrum prices

Rules based on these principles would help achieve a more consistent approach to licensing, encourage more ambitious investment outcomes across the Union and deliver the far-reaching goals of the Digital Decade to the ultimate benefit of EU citizens and businesses. In particular, and in terms of concrete proposals, the GSMA is of the view that the following measures should be considered — in addition to ensuring that elements in the current EU legislation (e.g., the EECC) are enforced nationally, as they are intended.

A mandate to Member States to assess the renewal of existing mobile licences as soon as possible and at least five years before the licence expiry date. Article 50 of the EECC already mandates that Member States assess renewals sufficiently ahead of the end of the licence term. There are precedents in Europe that show the value of doing that analysis long before expiration. In 2010, the UK switched to a regime of indefinite licences changing the 900, 1800 and 2100 MHz licence terms, with annual fees applying after the initial 20-year term. Along the same lines, Spain introduced the possibility for licensees to ask for a 10-year extension of all existing licences, up to a maximum of 40 years, in the latest telecoms law. In order to provide certainty for new investments, we believe there would be a benefit in establishing a deadline for all Member States to carry out the article 50 assessment by the end of 2025, for licences that expire before 2030, for example. As part of that assessment, Member States could consider switching to a regime of indefinite licences.

The development of rigorous socio-economic cost-benefit analysis to quantify the impact of EU-wide spectrum decisions in the upper 6 GHz, 3.8-4.2 GHz and UHF bands. Radio spectrum is a critical and scarce natural resource. Notwithstanding the principles of technology and service neutrality enshrined in article 45 of the EECC, policymakers often face the challenge of having to decide which service or technology should use each band, without necessarily having determined which option most efficiently delivers the greatest socio-economic benefits overall. Since spectrum allocation policies have measurable benefits and costs that can be quantified, a quantitative impact assessment in the form of an ex-ante cost-benefit analysis, published before any new allocation is done, should be considered a necessity when considering different allocation scenarios. In this context, the GSMA considers that stronger EU-level guidance, support and enforcement regarding the use of socio-economic cost-benefit analysis in decisions concerning allocation to different services and sharing scenarios in the upper 6 GHz, 3.8-4.2 GHz and lower UHF bands would be useful.

Finally, it is also important to note, in the context of the twin digital and green transition, that spectrum policy has the potential to address some of the challenges of climate change. Efficient spectrum policy can lead to a reduction in carbon emissions while simultaneously generating economic benefits to society. A report by GSMA[22] found that sub-optimal spectrum policy can lead to tens of millions of tonnes of additional CO_2 emissions. Inefficient spectrum policy and lack of additional spectrum for mobile can raise the cost of building and operating mobile networks and lower the adoption of emission-saving technologies, which could result in a missed opportunity to reduce emissions from households and other sectors that rely on mobile connectivity.

[22] Spectrum: the Climate Connection, GSMA, May 2023

We also call on policy makers to better take into account the impacts of any new target or technology roll out in light of their environmental impacts. Policymakers need to carefully consider how to better optimise existing equipment and technologies before rushing to incentivise new devices, equipment or networks before the market is ready. This also applies to the launch of new technologies like 6G. An approach that takesutmost advantage of all the capacities that a full 5G standalone network can offer before rushing to 6G roll out should be utilised. We call on the EC to adopt a clear longer-term strategy for advanced mobile networks (including 6G) that is aimed at completely capitalising on the full promise of 5G and subsequently fostering 6G at the appropriate time will help the helping the ICT industry to meet its net zero carbon target and enable other sectors to deliver on their own goals.

On the specific spectrum scenarios and potential considerations included in the white paper, the GSMA would like to provide the following detailed comments.

Existing licences

The white paper mentions the prospect of exploring the possibility for operators of EU core networks or pluri-national licensees to seek better aligned national spectrum authorisation processes and conditions for existing usage rights or general authorisations, including on aspects such as duration, Quality of Service (QoS)obligations and the integration of satellite and terrestrial networks.

Our understanding is that such a request would come directly from operators to the relevant spectrum authority in each country. It would therefore be useful to understand if the Commission envisages a role for itself in such a process and whether the proposal requires any changes to the current framework. However, the GSMA considers that the implementation is challenging from an institutional perspective and discriminatory to single-country operators, and even to pluri-national operators, noting that they operate in different sets of countries. In addition, it does not appear that such a process would have any relevant impact on certainty of tenure and thereby on investor sentiment.

As proposed above, our preferred approach to support investment is ensuring long-term predictability for existing spectrum licenses, through early decisions on prolongations and spectrum renewals, including the possibility of switching to a regime of indefinite licences, ensuring that any annual fees implemented after the first licence term are reasonable, based on the opportunity cost to ensure efficient spectrum use. It is important to highlight that past spectrum prices should in any case not be used as a reference for setting future annual fees, as the spectrum needed to meet the growing traffic demand is constantly increasing while revenues are flat.

We believe this would not negatively impact innovation or create a risk of inefficient spectrum use, noting that mobile broadband licences are technology and service neutral, and licensees can in principle use any electronic communications service or technology, and that frequencies can be diverted to the most efficient uses through spectrum leasing/trading, and mergers and acquisitions. On the contrary, there is evidence to suggest that licence renewals through auctions create a high risk of network assets becoming stranded, if frequencies cannot be renewed and high prices for spectrum resources that are already deployed and committed to serve societal demands.

Spectrum roadmap

The GSMA is of the view that the establishment of a clear roadmap for increased spectrum for mobile networks across low and mid bands is of vital importance to underpin the ongoing

digitalisation of society and secure a pipeline of new harmonised mobile spectrum bands to accommodate future customer traffic demands in an energy- and cost-efficient way.

We are therefore encouraged by the inclusion of a proposal for EU-level planning of sufficient spectrum to accommodate the growing traffic demand and the evolution of the existing networks. However, the proposal lacks detailed considerations regarding, for example, timing, the possible bands considered for future mobile networks use and how much spectrum. It is also unclear what exactly is meant by the reference that the 6G roadmap would be "enshrined in the law."

We anticipate that more spectrum will be necessary to meet expected mobile demand in a financially and environmentally sustainable way and, as such, there is a need for a spectrum roadmap for IMT more broadly, rather than only for 6G. At the EU level, the GSMA believes a clear roadmap on future spectrum availability for the provision of public mobile service is needed. Such a roadmap should include the upper 6 GHz and 470-694 MHz bands, as well as an assessment of 3.8-4.2 GHz band usage, while taking into account the environmental goals of the sector, and provide for an analysis of the socio-economic benefits of the considered scenarios.

It should also consider demands, possibilities and approaches for other bands, that is, bands studied for WRC-27 (4400-4800 MHz, 7125-8400 MHz, 14.8-15.35 GHz) for future deployment of 6G. In terms of timing, we consider that the publication of at least a draft roadmap for 5G evolution and 6G during the course of 2025 would be optimal.

We emphasise that spectrum should always be awarded on a technology-neutral basis, i.e., in such a way that it could be used for 5G evolution or 6G pending the level of demand. Increased mobile spectrum demand is caused by the increased level of mobile data use and this increase is not directly linked to a specific technology. For example, the user 5G and 6G equipment penetration, which varies per country and even per operator, impacts the optimal timelines to start increasing capacity in the network with 6G. Furthermore, licensing for new use cases and service scenarios in 5G evolution and 6G and the associated spectrum costs should be equal for all possible different users of the spectrum in relation to the delivery of the same services (e.g. MNOs, satellite, verticals, governmental, TV operators). This ensures efficient use of spectrum resources, and fair competition, especially when different players and solutions serve the same needs.

We support efficient spectrum use and note that this is achieved and optimised only when efficiency measures apply for all spectrum uses, not just mobile operators. One proven mechanism for this in Europe is annual incentive fees, when applied without discrimination to all spectrum users.

Supplementary use of mobile spectrum by infrastructure partners, for example, to extend coverage, improves efficiency, whereas some schemes proposed to try to accommodate conflicting demand in a common band (such as shared use of IMT and WiFi in the upper 6 GHz band) result in dramatically less efficient use, which can put investments in public mobile networks at risk.

The white paper also hints at the possibility of a coordinated switch-off of 2G and 3G networks to support the synchronised release and refarming of spectrum in the context of an EU spectrum roadmap towards 6G. Although it is neither desirable nor efficient for mobile network operators to run 2G and 3G networks in parallel while deploying 5G, such a strategic and commercially impactful decision should remain in the hands of operators, given the varying national and commercial circumstances and based on commercial requirements. National or EU level obligations for 2G/3G

timelines, both for switch-off and for service continuation, should be avoided as they do not necessarily align with customer needs in each market, or support efficient demand-based resource use and opposes the fundamental principle of technology neutrality.

Future award processes

In the context of future awards of new spectrum bands and a more harmonised authorisation landscape, the white paper mentions the possibility of strengthening EU-level coordination of auction timing; a potential notification mechanism for award processes as an alternative to the peer review process; and a potential single EU-level selection or authorisation processes for terrestrial, satellite and other innovative applications. In addition, it raises the importance of decreasing the financial burden of spectrum to help to bridge the significant investment gap in relation to deployment, e.g., by adopting a bidding process geared towards minimising spectrum costs and incentivising infrastructure investment.

The GSMA supports greater consistency of authorisation processes through clearly defined rules to ensure best assignment practices in each Member State, but we are cautious about centralised EU-level processes and coordination as a means to increase harmonisation.

Sufficient flexibility at the national level is required, and too strict and global release of specific bands risks delaying the release for all EU countries where one or more Member States have complex national circumstances that could result in a delay. The GSMA considers that harmonisation should concentrate on the timing of availability, the technical usage conditions of spectrum and clearly defined rules for fair and reasonable licence conditions (e.g., to avoid technology specific obligations, unreasonable coverage/deployment obligations and obligations that do not strictly relate to spectrum use).

The assignment dates should be decided at the Member State level according to market demand, but it should be ensured that each Member State efficiently awards a sufficient amount of spectrum in the key harmonised spectrum bands for nationwide mobile networks. We further note that awards that take place “too early” may lead to difficulties for the regulators to set the reserve prices and for the operators to value spectrum correctly in advance of the award. In addition to European harmonised conditions being in place, all licence conditions (e.g., possible national restrictions for using the spectrum) should also be clearly defined before the award. Moreover, payments for the spectrum should not be required before the spectrum can be used.

Notification mechanism

Looking ahead to the next wave of awards, the GSMA considers that a proper review process would reassure investors against artificially high spectrum prices, unjustified market-shaping measures, artificial spectrum scarcity, badly designed awards or policy short-termism. In particular, a notification procedure to the European Commission would foster compliance with the key provisions in the EECC and promote greater business certainty, in particular:

- Licence duration should even be indefinite or extended in the future to at least 40 years with tacit renewal (art. 49)
- Market-shaping measures should be justified with a market analysis (art. 52)
- Reserve prices should be based on opportunity cost (art. 42)

- Maximising public revenues should not be an objective of award processes (art. 55) and, in particular, there should be a balance between prices and operators' commitments regarding coverage obligations

We therefore welcome the inclusion in the white paper of the consideration of a notification mechanism similar to that used for market analysis as implemented under Article 32 of the EECC, as an alternative to the peer review process and to reinforce the coordination of authorisation procedures and conditions regarding the use of spectrum in the internal market.

Auction design to support infrastructure investment

The GSMA also welcomes proposals to decrease the financial burden of acquiring new spectrum through the potential adoption of bidding processes geared towards incentivising infrastructure investments. Approaches to assign mobile spectrum for free or with discounts in return for deployment commitments, longer license duration, could help bridge the significant investment gap in the deployment of advanced communications networks — both by creating the incentive and preserving capital budgets to realise the investment. However, we note that also in this case, the award process should be carefully designed in order to avoid overly burdensome commitments, and situations where an operator could overpromise in relation to deployment commitments and eventually not deliver on these commitments without consequences. This would not be fair for the other operators that have fulfilled their commitments or were left without discounts or even totally without spectrum because they made realistic promises.

EU-level authorisation scheme

On the issue of a potential EU-level authorisation scheme, the GSMA is of the view that the associated risks and possible downsides are too great where differing national circumstances play a role, and that introducing an EU-level scheme, particularly for terrestrial mobile services, would be overly complex. Also, it is not beneficial to smaller or single-country operators who will only face extra impediments. Mobile operators use a mix of bands for the same services in the EU and therefore having only one or some bands in such a scheme could cause further fragmentation. The timing of auctions and migrations would also be difficult to coordinate and as previously mentioned any joint release risks potential delays. Our preference is therefore for a better alignment of licensing approaches.

Satellite services

With regard to satellite services, these can complement terrestrial broadband services, and as such need to continue to be licensed to operate in spectrum bands specifically identified for Satellite Services (FSS or MSS). At the same time, there have been some developments in satellite technology that may enable LEO satellites to supplement terrestrial mobile coverage and where mobile operators may contract with satellite providers to selectively share their licensed IMT spectrum bands to provide direct-to-device satellite services.

Some countries allow, or are planning to allow, MNOs to grant sharing with LEO partners under Article 4.4. of the Radio Regulations on condition that the LEO partner operates in full compliance with the requirements associated with the original primary licence held by its MNO partner or partners, including with respect to interference. It is also notable that the US FCC has issued a Notice of Proposed Rulemaking that also foresees the market opportunity for direct-to-device solutions and proposes an initial mechanism so that MNOs can voluntarily sub-licence part of their mobile spectrum assignment to commercial satellite partners, offering the prospect of improved service

quality and more efficient spectrum use, while avoiding ambiguity on rights and obligations of mobile spectrum licensees.

In Europe the direct-to-device service may be expected to have more marginal benefits compared to some regions outside Europe, noting that terrestrial mobile service coverage is extensive in Europe. However, clear rules would avoid ambiguity on rights and obligations of mobile spectrum licensees, as well as on spectrum use nationally and across borders. Concerning the international preparations for WRC-27, it is important to ensure that terrestrial mobile networks remain the primary use in the harmonised mobile bands and that the direct-to-device satellite service should consequently be secondary to the terrestrial mobile service. National administrators are responsible for the compliance with regulatory provisions at country borders.

Governance structure

The white paper notes the potential need to reconsider the role of CEPT in EU technical harmonisation, given the participation of non-EU countries. As an alternative, an ad-hoc technical group of Member State representatives could assist the Commission and respond to key EC mandates.

The participation of non-EU countries or entities in technical preparatory work in CEPT 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. Although the work in CEPT is usually based on consensus, with final decisions taken by European administrations only, the EU27 represent the majority. 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 outside of CEPT. Experience shows that clear EC mandates and stronger consensus in the EU position in international negotiations are less disruptive alternatives that would not carry the risks and increased costs of setting up an ad-hoc EU group to respond to EC mandates.

The current process allows for the involvement of all relevant stakeholders and enables Europe to be best prepared for international negotiations. As such, there is a concern that the establishment of an ad hoc or permanent body of EU national telecom regulators may not allow for the same level of participation or transparency. Under the current regime, EU decisions are also backed by CEPT preparatory work, which decreases fragmentation between the EU and other European countries.

However, in the event that an ad-hoc group is deemed necessary where issues of EU sovereignty are at stake, the GSMA suggests that there should be clear criteria established for such a determination and that the cases should be strictly limited to those with impacts for EU security and resilience.

The white paper also briefly mentions that interference issues (from third countries) should be addressed by the Commission and all Member States acting jointly in bilateral and multilateral negotiations. 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 use restrictions is that EU services operated in the EU are backed by a primary allocation in the Radio Regulation. Only then do EU Member States have the right to request coordination for protecting their 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 the RSPG process) would be useful to account for scenarios in which a Member State faces difficulties reaching bilateral agreements.

More generally and in relation to the governance structure, the GSMA is of the view that the overall policy approach and strategic viewpoint beyond just technical harmonisation should also be considered from an EU perspective. In this regard, we believe that a more formal socio-economic cost-benefit analysis process is required for EU decisionmaking on spectrum issues. As previously mentioned, the GSMA considers that that stronger EU-level guidance, support and enforcement regarding the use of socio-economic cost-benefit analysis in both national and EU decisions concerning new bands (e.g. upper 6 GHz, 3.8-4.2 GHz, lower UHF) would be useful.

Pillar II: Completing the Digital Single Market, Scenario 7

> ***Scenario 7:*** *The Commission may consider facilitating greening of digital networks through promoting the timely switch-off of copper networks and the move to a full fibre environment and a more efficient use of networks (codecs) throughout the Union territory.*

Sustainability challenges and the mobile industry

Enablement effect

The mobile industry is committed to reducing its own emissions, and it is making a significant contribution to combating climate change through reducing the emissions of other sectors through smart connected technologies[23]. By increasing connectivity, improving efficiency and impacting consumer behaviour, mobile-network-enabled technologies are helping to reduce emissions. Connectivity is key to the 'green transition'.

In line with the Telecom Council conclusions[24], we emphasise the importance of using evidence-based methods to measure the environmental impact and benefits of digital technologies, which will aid the EU in achieving climate neutrality by 2050 and energy efficiency targets for 2030.

The energy challenge

Sustained cost pressures and commitments to net zero in support of the 2015 Paris Agreement have made energy efficiency a strategic priority for many operators around the world. In Europe, operators seek to enhance network energy efficiency by: (1) increasing the use of alternative energy sources to reduce dependence on the main power grid, and (2) optimising the network load and configuration (using advanced energy saving features) to reduce energy consumption.

[23] https://www.gsma.com/solutions-and-impact/connectivity-for-good/external-affairs/climate-action/mobile-net-zero-2024/

[24] Transport, Telecommunications and Energy Council (Telecommunications), 21 May 2024. *Council conclusions on the future of EU digital policy*, §35. https://data.consilium.europa.eu/doc/document/ST-9957-2024-INIT/en/pdf

Energy is crucial for the sector to achieve net zero emissions by 2050. Therefore, policymakers should facilitate access to low-carbon energy at an affordable price, particularly in the case of 'Purchasing Power Agreements', and by streamlining contractual arrangements and regulatory accounting. Additionally, they should incentivise the auto-generation of renewable energy at telecom sites, including buildings and land owned by operators.

Operators are investing in the networks of the future and, while mobile network evolution may lead to a significant increase in data traffic, it also presents an opportunity for a greener telecom footprint, for instance, the 3GPP's 5G specification aim for a 90% reduction in energy use.

Softwarization

Optimised network planning and deployment evolving towards network softwarization are key to maximising the capacity and quality of service for end users and increasing energy efficiency of both mobile terminals and networks.

From a sustainability perspective, there are clear benefits. Older physical equipment does not need to be disposed of, if it can be upgraded via software. This reduces e-waste, which is a major hidden environmental cost. It also decreases the need for physical activity such as site visits, logistics, shipping, servicing and maintenance. Less physical activity limits the climate impact of network updates and new features.

Cloud-based solutions also reduce dependency on hardware swap-outs. Newly built data centre components such as motherboards and chassis can be reused in future upgrades. This offers cheaper, more frequent, customised innovation, reducing manufacturing and transport emissions associated with the supply chain. The cloud also enables workloads to be moved and functions upgraded in a more flexible 'as-a-service' model.

Mobile Net Zero industry efforts

Transparency measures

The mobile industry is tackling climate change, having voluntarily developed a decarbonisation pathway aligned with the science-based target initiative (SBTi) and in line with the Paris Agreement target of achieving net-zero emissions by 2050. The sector is taking action to be fully transparent about the industry's own climate emissions and has developed an industry-wide climate action roadmap to achieve net-zero greenhouse gas (GHG) emissions by 2050, in line with the Paris Agreement.

The industry is making continued progress on disclosing climate data (rather than performance) and setting targets for emissions reductions. To date, 70 operators, representing approximately two-thirds of the industry by revenue, have committed to science-based targets intended to rapidly reduce their direct and indirect carbon emissions by 2030. 53 operators have committed to net zero targets by 2050 or earlier.[25]

GSMA members support agreement on standardised measurement for lifecycle carbon emissions and other environmental impacts. For the measurement of carbon emissions, the GSMA recommends using the GHG Protocol guidance for corporate reporting. This explains scopes of

emissions and how to measure them. For Scope 3 emissions, because they are difficult to assess, the GSMA has developed guidance specific for telecommunication operators.

On environmental impacts beyond carbon emissions, in 2021 the GSMA created a project group to begin to understand how to move towards a more circular economy for network equipment. In March 2022, the GSMA published a strategy paper on this topic, with one of the key recommendations being the provision of standardised data sets from network equipment manufacturers.

Considering all this, the GSMA calls on the European Commission to take into due account the work done to date at global level by the mobile industry, particularly when considering transparency measures and a code of conduct.

Enabling the circular economy and circularity of network equipment and devices

GSMA members are committed to circularity programs for devices and network equipment. These best practices contribute to the good governance of critical raw material within the EU. According to GSMA research, there are over 5 billion inactive used mobile phones globally. Mobile operators are targeting these phones for reuse, refurbishing or recycling as part of a more 'circular' supply chain for mobile phones.

To realise the potential of circular devices, the GSMA has set a shared industry vision for 2050, requiring collaboration among all actors in the telecommunications ecosystem. Immediate opportunities to improve circularity include: (1) understanding product flows, increasing the number of devices collected from consumers and creating a foundation to measure reclaimed devices and treatment method by share of recycled, repaired, reused and reclaimed devices; (2) increasing consumer awareness, based on understanding consumption habits in terms of end-of life treatment and incentives to increase longevity of devices; (3) engaging with suppliers to improve eco-design and sustainable production leading to greater repairability and durability of devices, which will increase their lifespan; and (4) engaging with repairers and recyclers to increase the number of devices that are reclaimed, repaired and recycled to maximise value retention within the economy.

The European Commission should support industry efforts by encouraging manufacturers to extend product lifespans and develop refurbishment platforms.

On the side of network equipment, the majority of GSMA members implement circularity programs that focus on reusing devices and network equipment, as well as recycling outdated gear. With around 80% of carbon emissions in Europe's ICT sector stemming from Scope 3, circularity is crucial for enhancing sustainability. Additionally, circularity practices are vital for the responsible management of critical raw materials within the EU. To promote circularity, the following initiatives should be encouraged:

- Encourage the use of recycled materials in network hardware
- Enhance the repairability of network equipment
- Facilitate the resale of used equipment
- Develop a European marketplace for refurbished and reused equipment

It is essential for the European Commission to support GSMA members' efforts in promoting circular economy principles for their network equipment by urging manufacturers to extend the lifespan of their products and create refurbishment platforms.

Waste and resource hierarchy
In the EU, e-waste is growing by 2% each year, while less than 40% of electronic waste is estimated to be recycled. The review of the Directive on Waste from Electrical and Electronic Equipment (WEEE) presents an opportunity to enable circular economy.

The WEEE collection system in Europe needs improvements to harmonise information requirements, support collective schemes and redefine Extended Producer Responsibility (EPR). Variations between Member States complicate waste management and reduce data accuracy. Prioritising collective schemes and involving more producers would encourage better product design for recycling. Finally, simplifying WEEE transfer rules between countries, such as allowing local testing, would facilitate a circular economy and reduce carbon emissions.

Taxonomy
To meet the EU's ambitious connectivity goals, operators must invest significantly in the networks of the future. The EU Taxonomy could support investments in sustainable networks by recognising the role played by the telecoms industry in enabling a greener economy. For that, it would be helpful if the sector was explicitly listed in the taxonomy framework. This recognition would highlight not only the industry's efforts to reduce emissions and environmental impact, but also its crucial role in deploying next-generation telecom networks that are essential for greening the economy.

A recent report by the Joint Research Centre (JRC) and the European Commission presents key performance indicators (KPIs) for measuring the environmental impact of electronic communication networks. These KPIs are based on input from stakeholders involved in designing, developing, deploying and operating telecommunications networks for both commercial and residential customers. The report could be a good starting point for the development of potential technical criteria for taxonomy. The criteria under the Corporate Sustainability Reporting Directive (CSRD) could also be considered, in order to harmonise ESG reporting.

The development by the European Commission of a code of conduct for telecommunication networks has merit and could be a valuable tool, provided that it takes into account the above-mentioned report and is developed in consultation with the sector.

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

Data optimisation/codecs
Regulators have a role to play in supporting the efforts of mobile operators working on reducing their footprint by optimising network operations, energy consumption and deployed network equipment based on actual and timely demand.[26]

[26] CF ARCEP general policy framework for the eco-design of digital services

Mobile data traffic in Europe is growing exponentially, fuelled by 4G migration in Central and Eastern Europe and increasing improvements in 5G coverage and capacity. Mobile video streaming is on the rise, and video is arguably the most significant traffic type generated by smartphone users. This increase in video data traffic has three main drivers: increased viewing time, more video content and evolution to higher-resolution, more complex formats.

A recent report by Ericsson[27], ranking users' perception of video-streaming quality on a scale from 0 to 5 indicates that video quality-of-experience scores are above 3 for 480p resolution and above 4 for 720p resolution. User perception remains consistent from HD (720p) onwards, due to the limitations of mobile devices, which make it challenging to distinguish higher resolutions given the capabilities of human vision. Despite this, settings are not optimised to enable data savings (e.g., by default offering high-quality video profiles, resulting in significant resource consumption).

Currently, end users and content providers lack clear incentives to reduce traffic usage. End users typically favour simple unlimited data plans that remove the risk of unexpected high charges. Consequently, competition among connectivity providers has led to a growing number of customers on unlimited plans. Content providers, on the other hand, face minimal variable costs for delivering traffic due to the current internet pricing structure. This leads them to send higher quality audiovisual content than necessary or even to overload the network with unwanted ads. It would be helpful to make content providers conscious of the impact of network traffic on the networks and the environment.

Therefore, we advocate for a policy that recognises the efforts of mobile operators investing in delivering future connectivity, that accepts the need for scale to avoid market fragmentation, and that enables a fair and proportionate contribution from the largest traffic generators towards the costs of network infrastructure. (See the preceding sections on Enhanced Fairness in the Value Chain and on Consolidation.)

Additionally, it would be essential to incentivise data optimisation. This could be done via stream saver solutions which could be based on experienced screen size (e.g., 480 pixels for smaller screens) and via data saving mode by default. For the uptake of such solutions, consumers should be informed and empowered to change their behaviour.

Together, optimised video traffic and network architecture, as well as ecodesign of digital services, will help achieve net-zero targets by acting both on upstream and downstream network capacity needs and bringing efficiently designed content closer to the end user. It will therefore free capital expenditures towards greener and innovative network solutions in full compliance with the objectives of the twin transition.

In France, network operators are involved in creative projects and standardisation efforts to limit the environmental impact of video streaming. On one hand, Open Content Delivery Network solutions are exposing operators' streaming capacities to all content providers to unveil the full potential in economic growth and environmental impact reduction from optimised video content delivery. On the other hand, network operators, content providers and administrative authorities in France are

[27] https://www.ericsson.com/49dd9d/assets/local/reports-papers/mobility-report/documents/2023/ericsson-mobility-report-june-2023.pdf

collaborating around standards governing the eco-design of digital services[28]. Published in May 2024, this policy framework relies on concrete and practical drivers to efficiently design a digital content such as using the best codecs, adapting video resolution to screensize and empowering end users to better control the digital service and tailor it to their needs.

Mobile network switch-off and future networks

The GSMA agrees with the European Commission that new technology will enhance sustainability efforts. In this equation, supporting and facilitating the switch-off of mobile legacy networks and the migration to new technologies is key.

Overlapping technologies are a large source of energy use and result in large parts of the radio access being duplicated. The main barriers to switching off energy-intensive legacy technologies are the installed base of end-user devices and the regulatory incentives or obligations to keep legacy technologies in use. The environmental costs of keeping an energy-inefficient technology running swiftly exceed the social benefits of imposing obligations on mobile operators (e.g., to provide connectivity for legacy 2G services).

Therefore, it is not desirable nor efficient for mobile network operators to run, in parallel, 2G and 3G networks while deploying 5G. Such a strategic and commercially impactful decision is the prerogative of operators. Regulations should not hold them back from switching off outdated technologies and thus delaying migration to more efficient, contemporary systems, nor require it.

For example, eCall Regulation mandates a solution for emergency calls that is mostly reliant on 2G (whereas regulation should be technology-neutral and cater to future network developments). The European Commission and Member States must support the roll-out of future mobile networks and always properly balance it with the need for a certain functionality to continue for some time. Furthermore, constraints on maintaining legacy networks means high, and increasing, energy consumption.

The priority for all parties in the eCall delivery chain is to work together to successfully make the transition happen from Circuit Switch (CS) eCall towards Next Generation (NG) eCall — which is over IP Multimedia Subsystem (IMS).

Future networks will bring added security levels to communication technologies and contribute to the important climate targets by a significant reduction in energy consumption. None of these ambitions can be fulfilled using old technologies brought to the market in the 1990s. It is therefore important to foster the adoption of new technologies to support the green transition.

6G is anticipated to be the primary mobile technology in the 2030s, supporting the UN Sustainable Development Goals through global coverage, sustainability and security. It will offer ultra-fast data rates, lower latency, increased energy efficiency and greater reliability. The European Commission should ensure 6G supports a net-zero carbon trajectory and aids other sectors in achieving decarbonisation.

[28] ARCEP, ARCOM, in connection with ADEME, DINUM, CNIL, and INRIA, May 2024. *General Policy Framework for the Ecodesign of Digital Services*. General policy framework for the ecodesign of digital services version 2024 (arcep.fr)

Commercially led infrastructure sharing

Infrastructure sharing led by operators is an essential component of the telecom operator's decarbonisation strategy since it (1) helps reduce energy consumption; (2) allows a reduced number of mobile sites (without any impact on service quality or coverage) and hence radio emissions of networks; and (3) avoids infrastructure overbuilding, thereby delivering environmental and economic benefits.

In addition, voluntary RAN sharing agreements allow parties to meet the high expectations on investment in terms of timing, quality and coverage and improve mobile coverage with minimum environmental impact. RAN sharing agreements contribute to EU environmental goals, as they reduce the number of mobile sites (without any impact on service quality or coverage) and thus their environmental impact. They also contribute to reduced energy consumption.

Further incentives could motivate commercially agreed network and infrastructure sharing. Although commercially agreed network and infrastructure sharing agreements have merit, they incur transaction costs that, in some cases, can only be completely offset by a single decision-making entity. Thus, a more lenient stance on in-market consolidation would help reap environmental gains through optimal network management and reduction of network duplication.

Pillar III: Secure and Resilient Digital Infrastructures for Europe

Secure and Resilient Digital Infrastructure

The Commission's white paper considers the role of quantum and post-quantum technologies. It should also emphasise the need for continuous improvement in the resilience and security of the digital infrastructures across the EU, which are essential for the digital infrastructure of tomorrow.

Digital infrastructure will evolve with technology, leading operators to adopt virtualised, software-defined, cloud-dependent systems. This evolution will broaden the attack surface as more actors become involved in the digital value chain beyond mobile network operators.

Mobile operators are responsible for delivering highly secure and resilient networks and products and must manage risks and supplier dependencies. The current mandate has given rise to some crucial security- and resilience-related legislative and non-legislative initiatives (CER, NIS2, CRA, DORA, 5G toolbox, etc.) seeking to ensure the whole supply chain of the future will be secure and resilient.

Therefore, it is important to ensure EU law is well implemented in the Member States. For instance, streamlining reporting and vulnerability handling at the EU level is essential to respond to upcoming challenges. The current fragmented landscape, exacerbated by specific national laws, risks market distortion and security weaknesses. For deploying 5G standalone, operators must be able to rely on shared, cloud-native and resilient networks across EU borders for specific functions.

To further enhance security and resilience, the Commission should continue working with ENISA, Member States and industry on the development of EU cybersecurity certification schemes based on existing standards, following a risk-based approach to security and resilience. These need to be delivered in a timely manner to support the implementation of the aforementioned legislative initiatives.

Finally, we invite the European Commission to assess the development of cyber-rating agencies and their impact on the EU market and rated entities. Such activities could benefit from a minimum common set of rules at EU level regarding solid methodology, transparency and information.

Towards secure communication using quantum and post-quantum technologies

Quantum computing will pose challenges for the security of digital infrastructures. It is already a reality and it will evolve rapidly in the years to come. Quantum security can be achieved by different means, i.e., Quantum Key Distribution (QKD) and Post-Quantum Cryptography (PQC). These means should be seen as complementary, and we should not focus exclusively on PQC, but also engage in work on QKD so that the EU does not get left behind, compared to its peers.

By investing in both QKD and PQC, the EU can ensure robust protection for digital infrastructures, and a way forward for Europe could be that the Commission considers:

- Funding for research and development in both QKD and PQC,
- Encourage collaborations between government agencies, academic institutions, and private sector companies to accelerate the deployment of quantum security solutions,
- Standardization aspects, and
- Investing in the necessary infrastructure to support the widespread implementation of QKD.

Annex: Barriers to a Telco Single Market in the EU

Barrier 1: Law Enforcement	
1. Description of the problem	
Nature of the problem	Lawful intercept ('LI') and data retention requirements at a national level existed long before the Single Market and introduction of European regulatory frameworks. Law enforcement has also remained a devolved competence of Member States, in terms of the specifics of implementation. As a consequence, there has never been a fully harmonised approach to lawful intercept guardrails. This situation has been exacerbated by the complexities of emerging technologies, types of providers and an increase in the reliance of such requests to support evidential proceedings. In particular: ▪ As noted there is **no harmonised framework for** lawful interception obligations at a European level. ▪ The EU Council Resolution (1995) summarises the needs of law enforcement agencies across Europe to enable lawful interception, encouraging Member States to implement the corresponding requirements into national law. However, this resolution did not place specific obligations on telecommunications providers. ▪ Most national rules are directed at 'traditional' telecoms operators only. There is therefore **no level playing field between communications services provided over the top** (e.g., WhatsApp) and network-based personal communications services. ▪ Despite the fact that the EECC brought all types of interpersonal communications into scope, the actual regulation of lawful intercept and disclosure obligations towards OTT players is lagging behind the technology evolution, in particular given the significant increase in the use of such OTT services (as replacements for traditional telecom services). For example, many of these OTT services operate without being established within a Member State, or having to fulfil the notification duty to operate.[29] A number of these issues have been identified of the High-Level Group on Access to Data for Effective Law Enforcement,[30] which clearly recognises the lack of consistency with respect to data retention rules (both from a geographic perspective, and also with respect to the targets of data retention obligations). We would urge the Commission to carefully consider these recommendations as part of their review of the law enforcement framework.
Magnitude of the problem	▪ The requirements, processes, systems and personnel supporting mandatory LI obligations are national. As a consequence, **the operation of communications networks and the provision of communications services require a unique set-up in each Member State to support LI.** This prevents efficiencies that could arise from centralising and leveraging best practice.

[29] NI-ICS are not required to notify national regulatory authorities that they are providing services in their market.

[30] 1105a0ef-535c-44a7-a6d4-a8478fce1d29_en (europa.eu)

	▪ The lack of common systems, processes and approach between Member States also impedes timely responses to sharing information to address **cross-border criminal activity**.[31]
Examples	See above. As mentioned under "nature of the problem" each Member State has its own approach to lawful interception.

2. Root causes of the problem	
Problem drivers	The opportunity to create a hamonised framework for law enforcement rules across Europe remains challenging: ▪ Security is not an exclusive EU competence that prevents the creation of a harmonised framework. ▪ Member State governments show significant support for maintaining national sovereignty for issues concerning national security (including interception). ▪ The cost of implementing LI requirements is borne by the operator in the majority of cases, therefore the burden on government is low – it is unlikely that they would want to see this change.
3. Future evolution of the problem	
Likely evolution of the problem	Without a more harmonised approach across Member States, and one that takes into account technological evolutions, these **issues will be exacerbated** over time. ▪ In particular, as technology develops, new capabilities are enabling criminal activity to cross borders seamlessly. For example, criminals are increasingly looking to alternatives to traditional communication services to communicate and coordinate, with a view to avoiding interception (e.g., OTT communications services that are end-to-end encrypted). ▪ As relevant regulation remains at the Member State level, its effectiveness in addressing such cross-border, pan-EU communications and activity remains impaired. ▪ In addition, as the reliance on digital communications as evidence in criminal cases grows, the number of law enforcement information requests rises year on year. In this environment, the different rules among Member States adds an increasing operational burden on communications providers and also allows criminals to target the weaknesses in the current fragmented systems. ▪ While the upcoming e-Evidence rules may help mitigate some of these developments, it does not change the need for a more harmonised approach to LI across communication services.

[31] Reference: "Lawful interception – A market access barrier in the European Union"? - ScienceDirect

Barrier 2: National Security Requirements	
1. Description of the problem	
Nature of the problem	Additional national security requirements (such as incident reporting) chip away at the advantages of the Single Market and come at a significant cost for businesses. ▪ **Increasing localisation and sovereignty requirements**[32] impair network operators' ability to scale operations. This reshoring of capabilities into national territories may disrupt carefully tailored capabilities and operating models, removes synergies of platforms, results in loss of efficiency and consistency for incident responses and renders collaboration with partners nationally, regionally and internationally more challenging. It may result in costly duplication and crowds out investment, including in future security capabilities. This would create barriers to the free movement of goods and services in the EU. ▪ **Security clearance procedures** and vetting personnel in multiple countries is time-consuming and cumbersome or sometimes not even possible. Security vetting levels in different countries might also not be the same, so the recognition of security clearance in one country might not be enough for another. ▪ **Fragmentation** caused by unharmonised, additional national security requirements increase the cost for businesses without benefiting the security and resilience of networks. For example, relevant Directives (EECC, NIS2) do not have a fully harmonised implementation and allow Member States to add specific national requirements. However, the resulting different reporting and notification requirements, for example, require extra operational resources, and this undermines effectiveness and consistency in incident management. It increases the compliance risks for companies without increasing network resilience. ▪ **Non-technical / political requirements** on grounds of national security increase uncertainty for businesses for future planning. These regulations, often motivated by public and national security concerns, prohibit telcos from implementing shared or uniform systems and functions or using personnel across borders. They not only increase operators' costs, but also prevent them from building best-in-class secure networks. Imposing restrictions on cross-border operations eliminates the possibility to create geographically distributed redundancies such as storing data in several data centers located in different Member States and enabling networks to be run from a neighboring country. It also hampers the use of scarce, highly qualified security personnel and state-of-the-art facilities like security operations centers across borders. This makes it difficult in practice to build, deploy and operate networks across borders, implement best practices and capture financial synergies.
Magnitude of the problem	Localisation requirements and fragmentation act as a barrier to a Single Market in telecoms, with telcos unable to take advantage of the economies of scale that would come with the ability to improve the resilience of networks through coherent security measures across the EU.
Examples	▪ **Localisation and sovereignty requirements**: Several EU Member States have decided to reshore Network Operations Centres (NOCs) and Security Operations Centres (SOCs) inside their country or at a minimum within the EU. This will lead to fragmented and sub-scale NOCs/SOCs, reducing the ability to leverage capabilities across the EU to assist with incidents and cyber events in any single Member State. ▪ **Fragmentation**: When implementing the security provisions of the EECC the type and nature of incidents requiring reporting varied across Member States, including reporting thresholds, the number of users affected, duration of the incident, etc. Despite further harmonisation efforts, this could still be an issue when transposing

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	NIS2, both in terms of differences between countries and sectors. Therefore, Member States should refrain from adding further requirements at national level. ▪ **Non-technical / sovereignty requirements** are found in many national security legislations, allowing the introduction of additional measures at a later stage on grounds of national security. This leads to uncertainty for business planning / investments.
2. Root causes of the problem	
Problem drivers	▪ A challenging **geopolitical environment** understandably drives national security concerns, but national reshoring and a fragmented security landscape undermine the creation of resilient security capabilities. Without examining the impact thoroughly and cooperating closely with industry stakeholders, this fragmentation risks undermining both businesses' and also Europe's resilience and competitiveness. ▪ **Security is not an exclusive EU competence** that prevents the creation of a harmonised framework, as it allows Member States to add requirements.
3. Future evolution of the problem	
Likely evolution of the problem	If the trajectory continues as it has done over the last years, the trend towards renationalising and reshoring is going to get worse and lead to **more fragmentation**. This prevents network operators from developing a centralised network architecture that can take advantage of scale and centralised operations. At the same time, it undermines the vision of the Single Market and European Competitiveness.

Barrier 3: Technical Regulation of Personal Communication Services	
1. Description of the problem	
Nature of the problem	The EECC regulates all '**interpersonal communication services**' (ICS) including **number-based** ICS (NB-ICS) such as traditional mobile telephony services, and **number-independent** ICS (NI-ICS), such as WhatsApp or FaceTime. The key issues in the **technical regulation** (i.e. beyond the lawful interception and security requirements outlined above) of these services stem from the significant differences in: ▪ How technical regulation is applied in each Member State to NB-ICS ▪ The level of regulation applied to NB-ICS versus NI-ICS, with the former being subject to a much heavier regulatory regime, **including separate national notification regimes** The consequences of this include: ▪ The **inability to provide a pan-EU NB-ICS**, given that compliance and operational requirements differ in each Member State. ▪ Services that are considered as functionally equivalent by end users are subject to different compliance obligations, impacting the protections experienced of end users and creating an **uneven regulatory playing field**.
Magnitude of the problem	Cumulatively, these issues act as a barrier to a single market in telecoms, with telcos **unable to take advantage of the economies of scale** that would come with the ability to innovate and deliver services across Member States.
Examples	The following are examples of areas where regulations diverge between Member States: ▪ **Numbering Rules:** Accountability for defining the numbering plan remains with the national regulatory authorities. Depending on the Member State, the way numbers may be assigned and used differs dramatically.[33] ▪ **Calling Line Identification (CLI):** This then leads to challenges with the CLI (the number presented to the dialled party). These rules are primarily in place to prevent end users from spoof/fraudulent/scam calls, as they give certainty about the origin of calls, but the rules differ from market to market.[34] ▪ **Anti-Fraud Measures:** In addition to CLI, in some markets there are specific measures in place that require operators to block calls that have a 'suspicious' CLI (for example, a call with a national CLI, entering the country from abroad). However, these rules are not uniform across the Member States. ▪ **Emergency Calling:** The technical requirements of how emergency calls must be routed are different in each market, as are the rules on what and how caller information is provided to the emergency authorities.[35] **NI-ICS do not need to comply with any of the above requirements.**
2. Root causes of the problem	
Problem drivers	▪ **Asymmetric implementation of the EECC**: The EECC is a Directive, and therefore a significant degree of divergence remains in the detail of its implementation.

[33] For example, in France, there is no longer a 'geographic number' concept. But in Hungary, there is strict location-based requirements, meaning a 'geographic number' can only be assigned to and used by a customer in the relevant geographic location associated with the number.

[34] For example, it is possible in Denmark to use a geographic number as the CLI for a voice service that runs on a laptop, an IP phone or a mobile phone. However, in Spain, for all these use cases, only a nomadic number is permissible.

[35] For example, in Ireland, emergency calls are handed to a central carrier to manage; but in Germany, calls must be routed according to the designated responsible emergency service. For example, some countries use a PUSH method for sharing location information, where information is shared with emergency authorities with the call (e.g., France); whereas others use a PULL method, where the emergency authority looks up dialler location information in a database (e.g., Finland).

	▪ **Equivalent services are not regulated equally:** The EECC distinguishes between NI and NB-ICS, and the regulatory obligations that apply to them. However (1) end-users see these services as functionally equivalent and use them interchangeably; (2) there are cases where these services interconnect (particularly when delivering enterprise communications services), yet the compliance burden rests only with the NB-ICS.
3. Future evolution of the problem	
Likely evolution of the problem	This issue is **likely to increase in severity** going forward, due to: ▪ New technologies (such as virtualised networks and cloud platforms) should allow for telcos to develop and deploy centrally managed services that can be delivered across the EU. However, the ability to take advantage of these economies of scale is curtailed by the need to comply with national rules in each Member State. ▪ NI-ICS services will become increasingly interchangeable with 'traditional' communications services, yet end users will not be protected in same way when using such NI-ICS services (e.g., against fraudulent WhatsApp messages).

Barrier 4: Consumer Protection Rules in the Electronic Communications Sector	
1. Description of the problem	
Nature of the problem	There is a lack of harmonisation on the rules relating to **consumer protection** in the telecoms sector. Member States (i) have interpreted and applied the sector-specific EECC consumer protection rules differently; and (ii) are empowered to add specific rules, beyond the EU-level rules
Magnitude of the problem	▪ As a consequence, operators must ensure that each service complies with the national rules in the countries they plan to launch. They must therefore **deploy services differently in each country**, for example ensuring there are distinct terms and conditions for retail contracts, tailor-made for each market. ▪ This acts as a barrier to the launch of pan-EU offers, and prevents operators from attaining economies of scale from such offers, given the **additional implementation, operational and compliance costs.** ▪ The problem is most acute for **multi-country business customers** who face an inconsistent user experience and functionality, depending on the rules for each Member State.
Examples	Examples of geographic fragmentation: ▪ Provider switching: Different Member States have different requirements for overall timeframe for switching between providers of services.36 ▪ Contractual impact of prices changes: In some markets, national legislation allows for mid-contract price changes, without a requirement to re-open the contract, while others do not. ▪ 'Know Your Customer' requirements: There are different rules in each country on ID requirements needed to conclude a telecoms contract.37 ▪ Transparency: Most markets require operators to be transparent, in particular, with respect to the quality of service customers may expect, but it is required in different ways.38
2. Root causes of the problem	
Problem drivers	The main problem driver is: ▪ The proliferation of ***sector-specific*** **customer protection rules** for communication services, beyond horizontal consumer protection rules, ▪ Which is exacerbated by the **lack of harmonisation**, with Member States either (i) interpreting and applying the EECC provisions in a market specific way; (ii) introducing additional obligations at a national level.
3. Future evolution of the problem	
Likely evolution of the problem	Continuation of the same challenge, impacting ability to create harmonised pan-EU services and processes.

[36] For example, Czechia has a maximum of 4 working days while it is 5 for Hungary. Some Member States don't stipulate any maximum timeframe.

[37] For example, there are different approaches on whether ID is required to enter into post-paid or pre-paid contracts (in Poland, ID is required for both; in Portugal, only for pre-paid). In some countries there are specific requirements to maintain a registry of pre-paid customers, (for example in Spain), which is not a requirement in other markets.

[38] For example: Germany sets out in detail what information is to be included for different service types, including the publication of coverage maps for mobile based services; Hungary requires general terms and conditions to be submitted to NRA before they are published for review.

Barrier 5: Obstacles to differentiated treatment of Larger Business Customers	
1. Description of the problem	
Nature of the problem	Larger enterprise customers are very different in nature from consumers, SMEs and nonprofits. Operators serving larger enterprise customers are, typically, bound by very extensive bilaterally negotiated legal contracts with a high level of protection for customers and a high level of transparency. Yet, they are often subject to complex consumer protection rules which result in redundant or unpracticable obligations and occasionally in unjustified threats of enforcement action from regulators. Therefore, acknowledging the objective differences and tailoring the regulatory environment to the specific conditions that impact services provided to larger enterprise customers would help the Single Market to flourish.
Magnitude of the problem	Many of the consumer-facing obligations in the EECC are not fit for larger enterprise customers. Where inappropriately applied, they create unnecessary burdens, diminish customer experience and disproportionately increase compliance costs. This impacts operator's ability to scale up business services and, in particular, hampers efforts to offer cross-border services.
Examples	Due to ambiguities in the EECC, operators are arguably subject to the same consumer protection provisions that apply to individual citizens, SMEs and nonprofits, even where they are serving large business customers. Commercial reality suggests, however, that the transparency measures and tariff information associated with individual consumers are far removed from the requirements of business customers, particularly non-SME businesses. B2B contracts are almost always negotiated bilaterally, by businesses and carriers directly, on a bespoke basis. Such contracts will typically contain tailor-made dispute-resolution procedures and other protections. Nevertheless, business carriers in many cases remain bound by consumer protection legislation, which is typically redundant in their circumstances. Examples include: ▪ Periodic obligation to report to the national regulator on complaints received from end users (Ireland); ▪ Obligation to port mobile phone numbers within 24 hours of customer request; ▪ Obligation to terminate contracts on 24 hours notice. Compliance with such requirements is a significant cost and resource burden both for affected carriers and for national regulatory authorities.
2. Root causes of the problem	
Problem drivers	The problem amanates from the lack of clear distinction in the 'protection' regime applied to consumers and SMEs versus large enterprise customers in the EECC.
3. Future evolution of the problem	
Likely evolution of the problem	▪ The challenge will simply continue, with operators continually unable to scale up business services and thus hampering operators' businesses. ▪