

## RESEARCH OUTPUTS / RÉSULTATS DE RECHERCHE

### Ideas for the future of European telecommunications regulations

Feasey, Richard; Alexiadis, Peter; Bourreau, Marc; Cave, Martin; Godlovitch, Ilsa; Manganelli, Antonio; Monti, Giorgio; Shortall, Tony; De Streel, Alexandre; Timmers, Paul

*Publication date:*  
2024

*Document Version*  
Publisher's PDF, also known as Version of record

[Link to publication](#)

*Citation for published version (HARVARD):*

Feasey, R, Alexiadis, P, Bourreau, M, Cave, M, Godlovitch, I, Manganelli, A, Monti, G, Shortall, T, De Streel, A & Timmers, P 2024, *Ideas for the future of European telecommunications regulations*. CERRE, Bruxelles.

#### General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal ?

#### Take down policy

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

cerre

Centre on Regulation in Europe



# IDEAS FOR THE FUTURE OF EUROPEAN TELECOMMUNICATIONS REGULATIONS

RICHARD FEASEY  
PETER ALEXIADIS  
MARC BOURREAU  
MARTIN CAVE  
ILSA GODLOVITCH  
ANTONIO MANGANELLI  
GIORGIO MONTI  
TONY SHORTALL  
ALEXANDRE DE STREEL  
PAUL TIMMERS

---

*September*  
*2024*



The logo for Cerre, consisting of the word "cerre" in a white, lowercase, sans-serif font, centered within a solid blue square.

cerre

Report

# **Ideas for the Future of European Telecommunications Regulations**

Richard Feasey  
Peter Alexiadis  
Marc Bourreau  
Martin Cave  
Ilsa Godlovitch  
Antonio Manganelli  
Giorgio Monti  
Tony Shortall  
Alexandre de Streel  
Paul Timmers

September 2024



As provided for in CERRE's bylaws and procedural rules from its “Transparency & Independence Policy”, all CERRE research projects and reports are completed in accordance with the strictest academic independence.

The project, within the framework of which this report has been prepared, received the support and/or input of the following CERRE member organisations: ARCEP, Agcom, BIPT, Comreg, Amazon, Deutsche Telekom, Huawei, Microsoft, Ofcom, Orange, Qualcomm, Telecom Italia. However, the views, opinions and conclusions expressed in this report are solely those of the authors in a personal capacity. They do not necessarily reflect the position of, and cannot be attributed to any of the abovementioned organisations. Neither these, nor any institution with which the authors are associated, nor any other member of CERRE, nor CERRE itself bear any responsibility for the content of the report or necessarily endorse it.

© Copyright 2024, Centre on Regulation in Europe (CERRE)

[info@cerre.eu](mailto:info@cerre.eu) – [www.cerre.eu](http://www.cerre.eu)



# Table of Contents

<b><u>ABOUT CERRE.....</u></b>	<b><u>4</u></b>
<b><u>ABOUT THE AUTHORS .....</u></b>	<b><u>5</u></b>
<b><u>EXECUTIVE SUMMARY.....</u></b>	<b><u>8</u></b>
<b><u>1. INTRODUCTION .....</u></b>	<b><u>12</u></b>
<b><u>2. THE STATE OF PLAY AND IMPLICATIONS FOR REGULATION .....</u></b>	<b><u>15</u></b>
2.1 PRODUCTIVE EFFICIENCY AND PRICES FOR CONSUMERS.....	16
IN THE FIXED SECTOR .....	16
IN THE MOBILE SECTOR .....	18
2.2 FINANCIAL RETURNS FOR OPERATORS .....	19
2.3 INVESTMENT AND COVERAGE .....	20
IN THE FIXED SECTOR .....	21
IN THE MOBILE SECTOR .....	21
UTILISATION .....	23
2.4 IMPLICATIONS FOR THINKING ABOUT REGULATION.....	23
<b><u>3. ECONOMIC REGULATION AND COMPETITION POLICY.....</u></b>	<b><u>27</u></b>
3.1 THE SMP FRAMEWORK .....	27
CRITICISMS OF THE SMP FRAMEWORK .....	29
REPLACING SMP WITH ‘BOTTLENECK FACILITIES’ .....	31
REPLACING SMP WITH SYMMETRIC REGULATION.....	33
BETTER IMPLEMENTATION OF THE EXISTING SMP REGIME.....	34
3.2 ACCELERATING MIGRATION FROM COPPER TO FIBRE WITH TARGETS AND FINANCIAL SUPPORT.....	35
SUPPLY SIDE MEASURES .....	35
DEMAND SIDE MEASURES .....	36
3.3 MEASURES TO LOWER INDUSTRY COSTS.....	37
SMARTER SPECTRUM MANAGEMENT.....	37
MORE REGULATORY HARMONISATION TO REDUCE CROSS/BORDER OPERATIONS.....	39
3.4 COMPETITION POLICY IN TELECOMMUNICATIONS .....	39
<b><u>4. USER PROTECTION AND NET NEUTRALITY.....</u></b>	<b><u>41</u></b>
4.1 CONSUMER PROTECTION MEASURES .....	41
4.2 OPEN INTERNET REGULATION .....	42
4.3 UNIVERSAL SERVICE .....	43



4.4 A NEW STRATEGIC APPROACH TO THE USE OF PUBLIC FUNDS IN TELECOMMUNICATIONS ..... 44

**5. RESILIENCE AND SECURITY ..... 45**

**6. SUSTAINABILITY AND CARBON TARGETS ..... 47**

EXTERNAL ASSESSMENTS ..... 47

SUPPLY-SIDE MEASURES ..... 47

DEMAND-SIDE MEASURES ..... 49



## About CERRE

Providing top quality studies and dissemination activities, the Centre on Regulation in Europe (CERRE) promotes robust and consistent regulation in Europe's network and digital industries. CERRE's members are regulatory authorities and operators in those industries as well as universities.

CERRE's added value is based on:

- its original, multidisciplinary and cross-sector approach;
- the widely acknowledged academic credentials and policy experience of its team and associated staff members;
- its scientific independence and impartiality;
- the direct relevance and timeliness of its contributions to the policy and regulatory development process applicable to network industries and the markets for their services.

CERRE's activities include contributions to the development of norms, standards and policy recommendations related to the regulation of service providers, to the specification of market rules and to improvements in the management of infrastructure in a changing political, economic, technological and social environment. CERRE's work also aims at clarifying the respective roles of market operators, governments and regulatory authorities, as well as at strengthening the expertise of the latter, since in many Member States, regulators are part of a relatively recent profession.



## About the Authors



Richard Feasey is a CERRE Senior Adviser, an Inquiry Chair at the UK's Competition and Markets Authority and Member of the National Infrastructure Commission for Wales. He lectures at University College and Kings College London and the Judge Business School. He has previously been an adviser to the UK Payments Systems Regulator, the House of Lords EU Sub-Committee and to various international legal and economic advisory firms. He was Director of Public Policy for Vodafone plc between 2001 and 2013.



Peter Alexiadis is a CERRE Research Fellow and a Visiting Professor at King's College, where he teaches the LLM modules on 'Competition Law & Regulated Network Sectors' and 'Digital Regulation'. Peter was a competition law and regulatory policy specialist attorney in Brussels for well over three decades, where he was recommended as a leading attorney in both areas of practice by all peer reviews. He has acted as an external adviser to the European Commission's DG Competition Telecommunications Unit, and has played a very active role in the crafting of the existing regulatory frameworks for electronic communications and digital platforms.



Marc Bourreau is an Academic Co-Director at CERRE and Professor of Economics at Télécom Paris (Institut Polytechnique de Paris). He is affiliated with the interdisciplinary institute for innovation (i3) for his research. His research focuses on competition policy and regulation, digital markets, and telecommunications. Marc holds a Ph.D. in Economics from the University of Paris Panthéon Assas.



Martin Cave is a Visiting Professor at Imperial College London. He was an Academic Co-Director at CERRE. He is a regulatory economist specialising in competition law and in the network industries, including airports, broadcasting, energy, posts, railways, telecommunications and water. Professor Cave has published extensively in these fields, and has held professorial positions at Warwick Business School, University of Warwick, and the Department of Economics, Brunel University.



Ilsa Godlovitch is an expert on telecoms and the digital economy with more than 20 years of experience in managing and conducting research and regulatory projects in this field. Ilsa has led studies for the European Commission regarding the Gigabit Infrastructure Act, Open Internet and Roaming Regulations, EU Electronic Communications Code and Broadband State Aid Guidelines, as well as conducting research for BEREC and National Regulatory Authorities on the environmental impact of electronic communications, and the evolution of fixed and mobile telecom markets.



Antonio Manganelli is Professor of Antitrust and Regulation at the University of Rome LUMSA, where he is also programme coordinator for the M.Sc. in Antitrust, Regulation and Innovative industries. Antonio holds a Ph.D. in Law and Economics from the University of Siena. He previously worked as Research Associate at the European University Institute, as coordinator of the Florence School of Regulation, and in several public institutions.



Giorgio Monti is a Professor of Competition Law at Tilburg Law School. He began his career in the UK (Leicester 1993-2001 and London School of Economics (2001-2010) before taking up the Chair in competition law at the European University Institute in Florence, Italy (2010-2019). While at the EUI he helped establish the Florence Competition Program which carries out research and training for judges and executives. He also served as Head of the Law Department at the EUI. His principal field of research is competition law..



Tony Shortall is a Director of Telage, a Brussels-based consultancy firm in the field of telecommunications economics and regulation. He is an economist specialising in the regulation of network industries and has written extensively on these matters and has advised governments, regulators and firms.



Alexandre de Streel is the Academic Director of the digital research programme at CERRE and Professor of European law at the University of Namur where he chairs the Namur Digital Institute (NADI). Alexandre is also visiting professor at the College of Europe (Bruges) and SciencesPo Paris. Besides, he chairs the expert group on the online platform economy advising the European Commission and is a part-time judge at the Belgian Competition Authority. His main areas of research are regulation and competition policy in the digital economy as well as the legal issues raised by the developments of artificial intelligence.



Prof Dr Paul Timmers is a research associate at the University of Oxford, Oxford Internet Institute, professor at European University Cyprus, visiting professor at KU Leuven and the University of Rijeka, senior advisor EPC Brussels, President of the Supervisory Board Estonian eGovernance Academy and CEO of iivii. Previously, he was Director at the European Commission/DG CONNECT where has held responsibility for legislation and funding programmes for cybersecurity, eID, digital privacy, digital health, smart cities, and e-government. At the European Commission, he was also a cabinet member of European Commissioner Liikanen.



## Executive Summary

- The current telecoms regulatory framework was introduced in 2002. It has proved flexible in accommodating a number of major changes in the structure of the industry (end of the State-owned monopolists), technology (broadband and mobile internet) and political objectives (more focus on investment in new technologies and less on price). However, after more than 20 years of existence, the European Commission is right to ask whether the telecoms regulatory framework is still appropriate for the future.
- Asymmetric economic regulation in telecoms has reduced as competition has increased, as was originally intended (the number of markets under the Significant Market Power (SMP) regime has reduced from 18 to 2 since 2002). But symmetric regulation has increased, and new and sometimes unexpected regulations have also been added outside the SMP regime: to reduce roaming fees and international call charges, to give access to ducts and poles, to ensure an 'open internet' and require removal of Chinese equipment on security grounds. These have reflected new political objectives for the telecoms sector, including increased focus on security, resilience or sustainability and single market goals.
- For mobile operators, these unexpected forms of regulation – and the cost of spectrum – have had a bigger effect than SMP regulation, which is much more significant for fixed operators. The impact of different types of regulation is therefore different for each activity.
- The existing regulatory regime aims to promote competition and has been quite successful at this, particularly for new fibre networks where Europe is more competitive than the US or other regions. The EC should be paying more attention to measuring competition alongside coverage. This is challenging because many fibre networks are local rather than national and infrastructure competition differs a lot between urban and rural areas. The industry and the landscape is more complex and fragmented now than in the past and future regulation needs to be able to handle this.
- Competition in mobile is more stable and is similar in Europe to the rest of the world, with 3-4 operators in most markets. On the basis of the data we looked at, the differences between Europe and the rest of the world on mobile, including 5G, do not seem to be mostly explained by differences in market structure.
- There are significant differences (up to 4x) between Member States if we look at the prices, network coverage and use of telecoms services, including fibre and 5G. These differences are often bigger than any differences between the EU and other regions of the world. They don't seem to be reducing, and it is not yet clear why they arise within the same regulatory framework.
- The same applies to the financial performance of different European telecoms operators, some of whom earn better returns and have lower financing costs than others. In general, the financial performance of the European industry has deteriorated to a greater extent than in the US or other regions. The outlook in Europe for the future is uncertain. This points to the need for the EC to take a cautious approach to regulation and target setting in future.



- Compared to most of the rest of the world including the US and Japan, some European Member States or operators are performing well on fibre (Spain, France) or 5G (Italy with Wind, Finland with Telia) or both (Netherlands), while others are lagging behind. 5G ‘coverage’ is particularly difficult to measure or compare, and the EC should improve its ability to do so. Given these wide variations, we should be cautious in using a European ‘average’ performance to compare with other regions.
- Some argue that Europe would have better performance if operators were ‘pan European’ and had more subscribers. There is, however, limited evidence at this stage inside Europe or when comparing with other regions that the number of subscribers determines profitability or how well operators perform. Fixed broadband prices are lower and fibre coverage is higher in Hungary than in Italy. Mobile prices are lower and 5G coverage higher in Denmark and Finland than in Germany. Large European operators have more fibre customers than US operators, and similar numbers of mobile customers. The industry structure will be determined by the owners of those firms, who will respond to economic and commercial opportunities, and not by the EC.
- Changes in the wider digital economy as well as changes in the technology used by telecommunications operators themselves (including increasing reliance on cloud services) could have far reaching consequences in the future.

## Recommendations

- Significant Market Power (or SMP) regulation was designed when fixed telecoms markets were dominated by former State-owned national monopoly networks. It has enabled competition to develop and allowed regulation to be withdrawn as it does. SMP regulation may still be required in future but the landscape it applies to will be different going forward: market power will be more localised and may exist when more than one operator is present (e.g. in a duopoly). SMP regulation may not be so effective in these circumstances, may distort competition or may be applied less consistently as it becomes more complex. We recommend that the European Commission considers an alternative, better tailored, approach which targets ‘bottlenecks’ instead of SMP. This would focus on the assets to which access is required to compete rather than the position of the owner of the assets. Making this change would present some challenges in terms of legal certainty in the short term. The alternative is to tighten and improve the way the existing SMP regulation is applied, for example by requiring national regulators to prove that a particular telecom market justifies intervention next to competition law in order to preserve the users’ long-term interests.
- We support the rapid retirement of copper networks to avoid wasteful duplication but do not think that EU compulsory targets are needed to achieve this. One key issue is whether an owner of a copper network must retire it if the alternative fibre network that is available is owned by a competitor or only when it has a network of its own available. If the former, the copper network owner may require some form of compensation. Whilst copper networks are still in use, we think more public subsidies should be used to encourage users to switch to fibre.
- Whether spectrum policies in Europe have worked well in the past or not is less important than a policy that is suitable for the future. With less new spectrum to auction, the main aim



should be to avoid spectrum regulation imposing unexpected costs for the industry and ensure that already available spectrum is being used efficiently. The quid pro quo we recommend is that operators are given longer term spectrum licences at no charge, but in return become subject to a ‘use it or lose it’ obligation which involves national regulators monitoring how well the spectrum is used. Regulators will need to change their approach in order to implement and enforce this approach properly and will need legal powers to do so.

- We do not recommend fundamental changes in competition law, but the EU merger regime may take a more dynamic approach to efficiency and consumer welfare. The facts which the EC needs to take into account should also reflect the changes in the industry. Network and other sharing arrangements could become easier to approve as control of networks moves to the cloud. More account should be taken of the security, resilience and sustainability implications of mergers and horizontal agreements, although these objectives may pull in different directions.
- As most Europeans are now accustomed to having competitive telecoms markets, some of the telecom-specific consumer protection regulation could be phased out; we could rely more on general rules that apply in the wider economy. Users and regulators have tended to focus on getting the lowest price in the past, but effort should now be made to focus as much or more on quality.
- There is a risk that the current interpretation of the Open Internet Regulation could prevent operators from offering distinctive 5G services, undermining the other EC objectives for 5G. The EC should be mindful of those risks and possibly adapt EU law and/or its interpretation.
- The approach to ‘universal service’ in Europe needs fundamental rethinking after years of piecemeal changes and additions. Are we concerned that low-income households can access telecoms services which the rest of us already have or are we using subsidies to promote widespread adoption of new leading edge technologies by everyone? How do these objectives relate to the public subsidies given to operators to extend their networks or to replace Chinese equipment or retire copper networks early? Addressing these questions in a coherent way will require a new approach to the use of public subsidies in the telecoms industry and new mechanisms for distributing funds.
- It seems clear that the European telecoms industry will need to invest more in security and resilience in the future. Again, we need to see a more strategic and aligned approach from the EC and Member States, anticipating developments before they happen and providing public funds where necessary, rather than imposing unbudgeted costs on operators, as when requiring the removal of Chinese equipment from 5G networks after it had been installed. We should aim to improve security without compromising competition in telecoms or our ability to collaborate with other regions to develop new technologies.
- The EC’s aims of expanding network coverage and increasing adoption and use of new 5G devices have significant environmental trade-offs which need to be recognised and mitigated. Users would be encouraged to better consider the environmental costs of using different digital services if operators were required to provide required real-time information about the network resources they consumed. Operators could be required to report on the



environmental impacts of networks by reference to a set of standard measures or targets which should be developed by the EC itself.

- Many of the other recommendations featured in this CERRE report – to retire copper networks, allow operators to better manage their networks under the Open Internet Regulation and enable greater network sharing – also ought to contribute to efficiency and sustainability goals. The European Commission should revisit some of its targets and consider alternative technologies in light of the environmental as well as the economic costs involved in deploying fibre or 5G networks in very remote areas.



# 1. Introduction

**Telecommunications regulation in Europe**, although modified in 2009 and 2018, **remains largely based in its fundamentals on the framework that was adopted in 2002**. This framework was introduced at a time when the main objective was 1) to promote competition in fixed telecommunications markets which had previously been dominated by State-owned and vertically integrated monopoly suppliers and 2) to ensure competition in rapidly expanding mobile telecommunications markets.

**Since 2002, the focus of policy makers has shifted as technologies and markets have changed and in response to concerns about Europe's global competitiveness and recovery from a series of economic crises**. The importance of digital infrastructure in driving economic growth and productivity is now widely recognised and the European Commission has adopted a series of targets for the deployment of new telecommunications infrastructure since 2010, all of which rely upon significant investments by the private sector and, more recently, additional public funds. Policy makers and regulators have as a consequence placed greater emphasis upon investment incentives when applying the regulatory framework and important changes to the 2002 framework were introduced in 2018, in the European Electronic Communications Code (EECC), to reflect this.

**Opportunities for new entry afforded by the transition from copper to fibre networks** have led to a greater focus on promoting competition between independent network operators instead of competition from firms reselling regulated access to the same monopoly network. This entry of new FTTH operators (and the upgrading of existing cable TV networks using DOCSIS technology to support broadband services) over the past decade represents the most significant expansion of competition in European telecommunications markets since 2002.

Attempts have also been made to **encourage more co-operative and commercial arrangements** between telecommunications operators, with amendments to the framework in 2018 intended to incentivise investments in 'wholesale only' fibre networks that supply retailers on commercial terms and to incentivise 'co-investment' by a number of a parties in a single co-owned fibre network.<sup>1</sup> These have had some success in fixed telecommunications, although many firms remain vertically integrated. Mobile assets such as towers are now widely shared amongst operators and many mobile operators provide wholesale access to their networks to MVNOs on a commercial basis.

The 2002 framework was intended to ensure that ex ante regulation was withdrawn as competition advanced and, on most measures and in most Member States, this has occurred.<sup>2</sup> However, the **retreat of asymmetric regulation under the 2002 framework has been accompanied by the advance of new legislation to address issues not anticipated by or not accommodated within the 2002 framework**. These include: 1) measures to reduce the costs of deploying new broadband infrastructures which are now part of the recently adopted Gigabit Infrastructure Act (GIA),<sup>3</sup> 2)

---

<sup>1</sup> EECC, arts.79 and 80.

<sup>2</sup> For instance, the number of markets regulated under the SMP regime went from 18 in 2003 to 2 currently, which provides an indication of reduced scope.

<sup>3</sup> Regulation 2024/1309 of the European Parliament and of the Council of 29 April 2024 on measures to reduce the cost of deploying gigabit electronic communications networks, amending Regulation 2015/2120 and repealing Directive 2014/61 (Gigabit Infrastructure Act), OJ [2024] L 2024/1309.



regulations targeted at reducing prices for international roaming and cross-border calling in Europe<sup>4</sup> and 3) the Open Internet Regulation (OIR) which regulates the way in which providers of internet access manage their networks and convey services.<sup>5</sup> Other legislation includes measures responding to emerging concerns about the security and resilience of critical infrastructures and in relation to the pursuit of sustainability and decarbonization objectives.

Probably more important than changes within the telecommunications industry have been **changes in the position occupied by telecommunications operators within the wider digital supply chain**. Most of the digital services consumed today are not created by operators of networks (as they were in 2002) but by ‘Big Tech’ content and applications providers, most of whom operate on a global rather than regional or national basis. Some of these providers have recently become subject to ex ante regulation in Europe under the Digital Markets Act and Digital Services Act<sup>6</sup>, but relations between digital service providers and the operators of telecommunications networks were not addressed at all in the 2002 framework and only to a limited extent in 2018. The OIR, adopted in 2015, addresses how telecommunications network operators are to manage digital services conveyed over their networks but does not address the conduct of digital service providers in relation to telecommunications operators.

One of the key unresolved questions after more than 20 years<sup>7</sup> is how the concept of a **European ‘single market’** applies to European telecommunications regulation, to the functioning of telecoms markets or to the structure of the industry. As our assessment of the state of play today reveals, telecommunications markets in Europe remain nationally focussed and vary enormously in terms of structure, regulation and market outcomes. Differences in performance between Member States – in terms of prices, coverage and adoption of new technologies – are often more significant than differences between some Europe average outcome and outcomes in other parts of the world. The reasons for these differences are still not often well understood or adequately recognised.

It is against this background that a team of academics specialised in telecommunications regulation at the Centre on Regulation in Europe (CERRE) have considered the potential for changes to be made to telecommunications regulation in Europe in order to offer a new toolbox to regulatory authorities. In doing so, we have benefited greatly from discussions over many months with the wide range of CERRE members – including telecommunications operators, corporations operating in other relevant industry sectors and regulatory agencies – sponsors of this study. We emphasise that the views expressed in this paper, which summarises the main conclusions and recommendations from our study (which are discussed in more detail in accompanying Issue Papers), are only those of the CERRE

---

<sup>4</sup> Regulation 2022/612 of the European Parliament and of the Council of 6 April 2022 on roaming on public mobile communications networks within the Union, OJ [2022] L 115/1.

<sup>5</sup> Regulation 2015/2120 of the European Parliament and of the Council of 25 November 2015 laying down measures concerning open internet access and retail charges for regulated intra-EU communications and amending Directive 2002/22 on universal service and users’ rights relating to electronic communications networks and services and Regulation 531/2012 on roaming on public mobile communications networks within the Union, OJ [2015] L 310/1, as amended by Regulation 2018/1971.

<sup>6</sup> Regulation 2022/1925 of the European Parliament and of the Council of 14 September 2022 on contestable and fair markets in the digital sector and amending Directives 2019/1937 and 2020/1828 (Digital Markets Act), OJ [2022] L 265/1 and Regulation 2022/2065 of the European Parliament and of the Council of 19 October 2022 on a Single Market for Digital Services (Digital Services Act) and amending Directive 2000/31, OJ [2022] L 277/1.

<sup>7</sup> For example, the recent report of Enrico Letta, *Much More than a Single Market* (April 2024) states: ‘Further development to provide Europe with the innovation platform for the future digital services requires operators with a pan-European footprint’.



project team and not of any member of the steering committee and should not be attributed in any way to any of those members.



## 2. The State of Play and Implications for Regulation

We think that any proposals to change telecommunications regulation in Europe should be informed by past experience and follow an assessment of the current state of play of the industry and outcomes for consumers. Changes should not be proposed without a proper diagnosis of the issues that need to be addressed and an understanding of their causes.

In this case the assessment has proved more challenging than expected for a number of reasons. First, there is a **lack of authoritative evidence on some important issues**, in part because the European Commission collects and publishes less data about the performance of the European telecommunications industry today than it has in the past<sup>8</sup>. For example, the Commission currently publishes data on network coverage in each Member State by fixed network technology on an annual basis as part of its assessment of progress towards the Gigabit Society targets<sup>9</sup>. However, it does not currently publish data on the number of competing networks represented in any given geographic area. National regulators are expected, under Article 22 of the EECC, to collect data on the geographic scope of all the fixed networks deployed or to be deployed by operators in a Member State to inform their assessment of competition in market reviews and when defining intervention areas for State Aid purposes. However, so far as we are aware, this data is not consolidated or published at European level. This means we lack a comprehensive or authoritative view of the complex competitive landscape in European fixed telecommunications markets today. Similarly, there are several different measures of coverage of 5G networks, each of which could lead to different conclusions about Europe's comparative performance but no obvious authoritative source.

Secondly, interested parties (including the sponsors of this study) will often hold **different views on the conclusions or inferences to be drawn from a given set of facts**. Outcomes in terms of prices or quality can reflect a wide range of factors, of which regulation may be one, but untangling which factors are most important are assigning weights to each can be the subject of legitimate disagreement. There may also be disagreements about which of the various objectives of the regulatory framework should be given greatest weight, particularly since the initial focus on promoting competition has been supplemented by other objectives, notably investment in very high-capacity networks, since 2018. Things will change again in future, when we expect there will be greater focus on other objectives, including ensuring resilience and reducing carbon emissions. This increases the chances that objectives conflict and that more difficult choices or trade-offs will need to be made.

Thirdly, **references to 'European averages'** or generalised conclusions about outcomes for 'European consumers' or the performance of 'European operators' may be **misleading** and often meaningless when markets remain fundamentally national in nature and when they differ so much within Europe. It is important to stress our finding that outcomes in terms of indicators such as retail prices or average broadband speed vary as much - if not more - between Member States within Europe as between Europe as a whole or on average and other regions of the world. This shows that very different market

---

<sup>8</sup> Earlier Implementation Reports (which focused on telecommunications) were replaced by Digital Economy and Society Index in 2014, and by State of the Digital Decade Reports since 2023. The latter a broader in scope, and data relating specifically to telecommunications activities is more limited than appeared in the Implementation Reports.

<sup>9</sup> Available at <https://digital-strategy.ec.europa.eu/en/library/broadband-coverage-europe-2022>



outcomes are possible even when operators are all subject to the same European regulatory framework (whose implementation by national regulatory authorities may sometimes vary across countries) and that factors other than regulation play a very important role.

Understanding why outcomes in telecommunications vary between Member States is in our view as if not more important today than understanding differences between Europe and other regions of the world.

With this in mind, we summarise our assessment of the state of play in Europe today.

## 2.1 Productive efficiency and prices for consumers

Retail prices are an important determinant of consumer welfare, and the European regulatory framework aims to promote competition both in order to contribute to greater productive efficiency and to ensure that the benefits of these efficiency gains (which principally arise from investments in new network technologies) pass to consumers in the form of lower quality adjusted prices.

The retail prices paid by European consumers have generally been the consequence of such competition (supported by regulation) between operators rather than the result of direct retail price regulation, with the important exception of regulatory caps which have been applied to retail prices for international roaming and cross-border calls within Europe.

### In the fixed sector

Studies consistently show that **retail prices paid by European consumers for fixed and particularly mobile telecommunications services are lower than prices for comparable packages in other parts of the world** such as Japan and Korea<sup>10</sup> and very much lower than prices paid by consumers in the United States. This could indicate lower network costs or greater efficiency on the part of European operators or greater competitive pressure to pass efficiencies onto consumers or some combination of these factors.

On network costs, the comparative data is limited but we observe that within Europe, Member States in which we would expect lower costs to deploy fixed networks (such as Lithuania, Latvia, Romania or Bulgaria) do tend to exhibit lower retail prices than Member States (such as Germany, Netherlands or Belgium) where we might expect network and labour costs to be higher<sup>11</sup>.

Whether lower prices in Europe are evidence of **greater cost efficiencies** is also uncertain but in our view is unlikely. Indeed, it has been asserted, including by the European Commission in its latest White Paper,<sup>12</sup> that the opposite is the case and that European network operators have been unable to realise the economies of scale and cost efficiencies that operators in the United States and other regions are able to obtain. If that were so, then we might expect retail prices in the United States for

---

<sup>10</sup> We rely on the most recent Commission study published in 2024: European Commission *Mobile Fixed and Broadband Prices 2022*, CNECT/2022/OP/0012. Figure 23 shows that for all fixed services baskets, US mean least expensive prices are at least 3x the equivalent mean least expensive prices in Europe and that mean least expensive prices in South Korea and Japan were consistently higher (with the exception of >1Gb/s baskets in Japan). We are aware that there are many such price comparison studies and that differences in methodology can yield different results. All suggest that European prices are generally lower than those in the US, Japan and Korea, and that they have been consistently so for years.

<sup>11</sup> European Commission *Mobile Fixed and Broadband Prices 2022*, CNECT/2022/OP/0012, fig 3, 4 and 5.

<sup>12</sup> See Commission White Paper of 21 February 2024, *How to master Europe's digital infrastructure needs?*, COM(2024) 81.



equivalent services to be lower than in Europe and for prices in larger European Member States to be lower than those in smaller Member States. So far as comparison with the United States is concerned, however, the opposite is the case and prices within Europe also vary in ways which appear unrelated to either population size or geography<sup>13</sup>. There is therefore no reason to think that lower European prices are associated with the superior efficiency of European operators compared to those in other regions. The financial data, which we consider below, also does not support such a claim.

We think there is better evidence that **competitive pressure or market structure** has ensured that a greater share of the efficiencies may have been passed onto consumers in Europe than in other parts of the world. In fixed telecommunications - and unlike in the United States during this period - the European regulatory framework has since 2002 promoted retail competition by requiring former monopoly network operators to provide rival retailers with regulated access to various network facilities and services.<sup>14</sup> More recently, the same framework has been adapted and used by many national regulators to promote the competitive provision of FTTH services by allowing new entrants regulated access to the civil engineering ducts and poles of the former monopoly network owners.

The consequence of this is that (notwithstanding the lack of authoritative or granular data, as discussed above) **European fixed telecommunications markets appear generally less concentrated and likely more competitive** than those in the United States. This not something which would have been anticipated in 2002 or even in 2010, when the United States exhibited greater competition from cable TV networks upgrading to provide broadband services than was feasible in Europe. We think the network competition that has developed in Europe since then is likely to be an important factor in explaining the lower prices for fixed services that we see in Europe today.

We do know that market structures (in terms of fixed network competition in the provision of very high-capacity services) **vary significantly both between and within Member States**. The situation remains fluid as operators continue to deploy FTTH networks in many Member States and potential customers have yet to migrate to FTTH connections. We know that a significant degree of network overbuild has already been achieved in some local markets, with at least three and often more FTTH networks in place and competing for customers (sometime in addition to competition from a cable network)<sup>15</sup>. However other areas in Europe, particularly rural areas, continue to be served by a single monopoly network. We do not at this stage know how far ultrafast network competition will eventually extend nor precisely what implications this will have for the prices consumers pay. The effect on retail prices will depend, amongst other things, on whether operators which face very different competitive conditions in different geographic areas are still required to set retail prices on a national basis or whether they are allowed to set different prices in different geographic areas and, if so, whether they choose to do so as a commercial matter.

---

<sup>13</sup> European Commission *Mobile Fixed and Broadband Prices 2022*, CNECT/2022/OP/0012. For example, Hungary, Czech Republic and Latvia have fixed broadband prices that are significantly lower than Germany, France or Italy (see fig 3) and Denmark, Finland and Latvia have mobile broadband prices significantly lower than Germany.

<sup>14</sup> M. Cave, C. Genakos and T. Valletti (2019), 'The European Framework for Regulating Telecommunications: A 25-year Appraisal', 55 *Review of Industrial Organization*, 47-62.

<sup>15</sup> For calculations of 'overbuild ratios' for some Member States, see Analysys Mason 2023, fig 3.2, p.7 at <https://applications.crtc.gc.ca/DocWebBroker/OpenDocument.aspx?DMID=4400762>.



## In the mobile sector

Competition in European mobile markets is less influenced by the application of the 2002 SMP framework since that framework has largely frustrated attempts by national regulators to impose access obligations on mobile network operators (due to the challenge of demonstrating joint dominance or joint SMP). **Competitive dynamics are therefore more readily explained by the spectrum licensing policies** adopted by Member States (which determine the number of network operators and often their relative competitive position) **and by remedies that have been required by the European Commission in order to approve mergers** between mobile operators (which may affect the number of network operators and/or terms on which MVNOs compete).

There are differences between Member States but, in general, the competitive structure of most European markets comprises of three or four vertically integrated network operators and some MVNOs operating under commercial wholesale arrangements. In the case of some 'tri-network' markets, MVNOs operate under arrangements introduced to remedy competition concerns when the number of network operators reduced from four to three following a merger. This kind of market structure is not materially different from that found in other countries, including the United States, Japan and South Korea, although there are obvious differences in the size (as opposed to number) of competitors to reflect differences in population and/or geography.

Despite these relatively modest differences in market structure, **prices for equivalent mobile services are, on average, materially lower in Europe than other regions**, including the United States<sup>16</sup>. As with fixed telecommunications, if economies of scale resulted in greater cost efficiencies, then we might expect European mobile markets to exhibit higher prices relative to markets in other regions rather than lower prices.

Unlike fixed telecommunications, where there are clear differences in market structure between Europe and other regions, we do not see an obvious structural explanation for why mobile prices in Europe should be materially lower than in other regions or why they vary so much between Member States within Europe<sup>17</sup>. Member States with the lowest fixed telecommunications prices tend to have amongst the lowest mobile prices, suggesting that lower network costs may be a common explanatory factor for both. However, there are also exceptions to this<sup>18</sup>. Spectrum costs can be significant for mobile operators and can vary dramatically both within Europe and between Europe and other regions. There is some evidence that, in some cases, Member States with higher spectrum costs exhibit higher retail prices. American operators typically pay significantly more for equivalent spectrum than their European counterparts.<sup>19</sup>

---

<sup>16</sup> European Commission *Mobile Fixed and Broadband Prices 2022*, CNECT/2022/OP/0012, p.128-131 shows EU27 prices for equivalent baskets to be lower than the United States, generally by a factor of 1.5-2x, and lower than Japan and Korea by 4-6x.

<sup>17</sup> Put another way, the effect of 4 to 3 mergers in European countries would have to result in price increases of 150-200% in order to allow mobile operators to generate average ARPU or charge prices at similar levels to US operators. Most merger simulations for such merger suggest price increases of only 5-10% are likely. This implies that 4 to 3 mergers would fall a long way short of allowing European operators to match the financial performance of their US counterparts.

<sup>18</sup> For example, according to the Commission's study cited above, Denmark has the second lowest mobile broadband prices but relatively average or high fixed broadband prices, see figs 3 and 5.

<sup>19</sup> GSMA *Effective Spectrum Pricing: Supporting better quality and more affordable mobile services*, February 2017, <https://www.gsma.com/spectrum/wp-content/uploads/2017/02/Effective-Spectrum-Pricing-Full-Web.pdf>. It is also possible that the converse applies and that lower spectrum prices are, at least in part, a consequence rather than a cause of



It seems likely that there will be other factors, such as *demand side conditions* or differences in distribution models, which also explain differences in mobile retail prices between Member States and between Europe and the rest of the world. This is an important but as yet unresolved issue.

## 2.2 Financial returns for operators

If prices for fixed telecommunications services are lower in Europe and prices for mobile services much lower - and if this were attributable to differences in competitive conditions rather than underlying costs or efficiency - then we would also expect to see this reflected in lower margins or financial returns earned by European operators relative to their counterparts in other regions.

The published data on financial returns of operators is limited and interpretation is often difficult. European operators typically operate both fixed and mobile networks but report their financial performance on a consolidated basis. We know returns on capital employed by European operators have, in aggregate, been deteriorating in Europe (as they have elsewhere in the world) for a number of years. ETNO reports that its member's Returns on Capital Employed (ROCE) have fallen from 8-9% to 5-6% in recent years.<sup>20</sup> HSBC estimates average returns on invested capital (ROIC) of major European operators in 2024 of around 8%<sup>21</sup>. Declining returns on assets have also been reflected in the underperformance of most European telecommunications stocks relative to wider financial market indices.<sup>22</sup>

However, financial performance also **varies dramatically between European-based operators**. Analysis by Breakingviews reveals that Deutsche Telekom generated a Total Shareholder Return (TSR) of 63% over 3 years from 2021 to 2024 and Telefonica a TSR of 44%. Vodafone (which like Deutsche Telekom has significant non-European holdings as well as European assets) posted a TSR of minus 30% over the same period<sup>23</sup>. This means we should be cautious about making generalised statements about the financial position of the European sector as a whole<sup>24</sup>.

More important for future investment, the outlook for growth and future returns to investors (as reflected in the multiples implied by current valuations appears to be similar for most European operators (at 5-7x EBITDA) as for operators in other regions such as the United States (where Verizon and AT&T have both traded in a similar) or Asia (NTT and SKT)<sup>25</sup>.

Overall, the evidence suggests that **lower retail prices for fixed telecommunications services in Europe reflect consumers' ability to capture a greater share of efficiency gains than consumers in other parts of the world and that this is at least partly reflected in lower returns on capital for operators in Europe**<sup>26</sup>. Lower mobile prices may also reflect a greater ability of European consumers

---

lower mobile retail prices (e.g. in comparing the EU and US, as spectrum prices have also tended to be materially higher in the US than in the EU), See R. Marsden, 2024, *Round by Round: Learnings from the first thirty years of spectrum auctions*.

<sup>20</sup> ETNO, *State of Digital Communications*, January 2024, fig 5.8.

<sup>21</sup> HSBC *European Telecoms: New Commission 2024-29, what's in store for telecoms*, 24 June 2024, p.10.

<sup>22</sup> The main issue here is that the major US indices are dominated by the global digital services firms that have outperformed most other sectors, including telecommunications, in recent years.

<sup>23</sup> Reuters Breakingviews, 1 March 2024, *European telcos' new deal hopes face reality check*.

<sup>24</sup> This is consistent with the HSBC estimates referred to above, which show operator ROICs ranging from 4.6% (Telecom Italia) to 16.3% (Elisa) and 11.4% (KPN).

<sup>25</sup> ETNO *State of Digital Communications 2024*, fig 5.3.

<sup>26</sup> ETNO reports average ROCE of its members as 5.8% in 2022 (*State of Digital Communications 2024*, fig 5.8). US operators Verizon and AT&T reported ROCEs for 2022 of around 7% and 10% respectively. However, we note that the OECD recently estimated average ROIC for a range of telecommunications operators in Europe, the US and Asia (including both incumbent



to capture a greater share of efficiency gains, although we have yet to find a good explanation as to why mobile prices are so much lower in Europe than in other regions and the industry does not publicly disclose returns on capital for mobile and fixed network assets separately.

The lack of a complete financial diagnosis is significant when thinking about changes to regulation. If a concern were comparatively low returns on mobile network in Europe compared to other regions, then factors other than market structure (which is similar in Europe to other regions) would need to be considered. These would include demand side issues, the costs of spectrum or changes to the regulation of international roaming services or the OIR, all of which would be candidates for potential regulatory responses. On the other hand, if comparatively lower returns are mainly associated with returns on fixed network capital, then the greater competition in Europe and the use of ex-ante regulation to promote entry are more likely to be part of the explanation.

It is also important to avoid drawing conclusions from the past that may not be representative of future financial prospects. **Since at least 2010, the European telecommunications industry has been engaged in a significant investment programme**, spending of the order of €60 billion a year on average (although similar or greater capital investments have also been made in other regions during the same period<sup>27</sup>). We would expect capital intensity in Europe (i.e. capital investment as a proportion of revenue generated) to fall from these elevated levels as FTTH and 5G network deployments are completed, the costs associated with retiring copper networks are expensed and further spectrum purchases are less significant than purchases in the past<sup>28</sup>. This could allow the financial performance of at least some European operators to improve relative to the recent past. On the other hand, significant risks also remain for the industry. These include further attempts by Member States to extract funds from existing spectrum assignments and risks arising from further changes in the telecommunications supply chain and new forms of entry.

We are not aware of evidence to suggest that the European regulatory framework has led operators to deploy networks of inferior **quality** (in terms of the technologies and equipment that is deployed) or that are less **resilient** in Europe as compared to other regions<sup>29</sup>. We recommend this is something on which European Commission considers collecting data in future, not least because reliability has become such a critical aspect of network performance (as the Resilience and Security paper discusses).

## 2.3 Investment and coverage

The European Commission has, since around 2010, increasingly focussed on the rate and timing of deployment of new network technologies, including in comparison with their deployment in other regions such as the United States or Asia. This is motivated primarily by a concern that regions that are 'late adopters' of new network technologies or which deploy them only on a limited basis will be

---

and non-incumbent operators) of around 6% in 2022 (with little difference between incumbent and non-incumbent operator returns), suggesting that the ROICs of large European operators on average may not be lower than those in other regions, but that the ROICs of particular operators may well be. See OECD *Financing Broadband Networks of the Future*, OECD Digital Economy Paper 364, June 2024.

<sup>27</sup> ETNO *State of Digital Communications 2024*.

<sup>28</sup> Analysys Mason *Network capex has started a long decline, opening up new options for operators*, 29 May 2024. See R. Marsden (2024) for evidence that spectrum costs (on a per MHz/pop) basis have already been declining for some years.

<sup>29</sup> Here we are concerned with the capabilities of networks that are being deployed. We recognise that average download speeds and similar metric differ between Europe and other regions, but this reflects differences in the rate of adoption of new network connections rather than the quality of those connections per se.



deprived of opportunities to lead in related industries, particularly in digital services, which are enabled by the new networks and by the new markets they create<sup>30</sup>. Even if early or widespread adoption of new technologies did not affect opportunities for European firms in related digital services markets, it would still influence the rate at which European consumers could access and consume digital services which have their origin outside of Europe. The Commission has for these reasons adopted a series of targets – Digital Agenda, Gigabit Society and Digital Decade 2030 – which have as their objective investments in the rapid and widespread deployment of new networks or network technologies.<sup>31</sup>

### In the fixed sector

**FTTH network deployment varies greatly between Member States** in Europe today. It is worth emphasising that France, Spain and Sweden have amongst the most developed FTTH networks and some of the highest levels of FTTH adoption in the world today<sup>32</sup>. Others, such as Italy and Germany currently lag behind other regions as well as behind most other Member States. These differences in performance are generally attributed to the physical characteristics of existing networks (which meant that some Member States could obtain greater improvements in broadband performance over existing copper networks without FTTH deployment whilst others could not) and differences in competitive conditions (with the presence of HFC networks being an important factor in accelerating FTTH deployment in some Member States and the entry of other independent FTTH operators another) as well as to differences in regulatory approach<sup>33</sup>, planning rules and the extent to which public subsidies have been used by national Governments to extend or accelerate fibre deployment.

In these circumstances, it is misleading to draw generalised conclusions about European performance in FTTH deployment relative to other regions, other than to note the greater degree of entry and new network overbuild in many Member States compared to other regions of the world. The more important question is why some Member States lag other to such a great degree. We have already noted that the reasons for this are many and various, with differences in approaches to regulation only one factor.

### In the mobile sector

The record on 5G network deployment (both in mid-band and lower frequencies) appears less positive than for FTTH. **5G deployment in Europe generally does appear to lag behind** the United States and

---

<sup>30</sup> We note the Letta Report has a similar concern that the fragmented landscape for European telecommunications networks inhibits the ability of European digital content and service providers to scale their services as so become globally competitive. Whether, why and the extent to which the growth in European digital content and service provision is in fact inhibited by either late adoption of new network technology or fragmentation of networks is beyond the scope of this paper.

<sup>31</sup> Most recently: Decision 2022/2481 of the European Parliament and of the Council of 14 December 2022 establishing the Digital Decade Policy Programme 2030, OJ [2022] L 323/4.

<sup>32</sup> European Commission *Broadband Coverage in Europe 2023*, CNECT/2021/OP/0081 and FTTH Council (2024) *FTTH/B Market Panorama 2024* at <https://www.ftthcouncil.eu/download.aspx?id=77>.

<sup>33</sup> We think it is worth recalling that the regulatory approach which has led Spain and France to outperform most of the rest of the world was initially resisted by the European Commission in the early 2010s but was subsequently embraced by it and by other Member States once its effectiveness became apparent.<sup>33</sup> This was an example where the European telecommunications regulatory regime was able to adapt quite quickly (without requiring legislative change) in order to 'scale up' successful experimentation by a sub-set of Member States. T. Shortall and M. Cave, 'Is Symmetric Access Regulation a Policy Choice? Evidence from the Deployment of NGA in Europe', *COMMUNICATIONS & STRATEGIES* 98, 2015, p.17.



China<sup>34</sup>, both in terms of population coverage and, more significantly, in adoption of 5G-enabled devices<sup>35</sup>. There are two issues here. First, coverage data for mobile networks has been more challenging to produce than data for fixed networks and the results obtained will vary significantly depending upon the assumptions used. In the footnotes, we highlight the significant variations in the results reported by the European Commission's consultants and those produced by other sources, such as Ericsson. We recommend that if the Commission is to propose significant changes to regulation based upon concerns about the comparative performance of European operators in delivering 5G network coverage, it ensures that it has data that allows it to properly assess comparative performance on an appropriate basis<sup>36</sup>.

Second, the reasons for and implications of Europe's underperformance in 5G deployment and adoption are quite difficult to determine. Greater and earlier deployment in the United States appears to have been driven in part by the opportunities to provide Fixed Wireless Access (FWA) services, which have not been a significant feature of many European markets to date<sup>37</sup> - rather than opportunities for IoT or other services which were expected to be the primary driver for new 5G Standalone deployments. We are uncertain what has driven deployment in China, but we suspect that wider industrial policy objectives (to support mobile equipment and device vendors as well as new digital service providers) may be part of the answer.<sup>38</sup>

5G deployment also depends upon the timing and availability of mid-band and millimetre wave spectrum, which has been allocated at different times by different Member States but generally later (and in lower quantities) than in the United States and China<sup>39</sup>. **The financial position of some European operators, discussed above, may have constrained their ability to invest in new 5G infrastructure** whilst at the same time making significant investments in fixed fibre infrastructure (on which, to some extent, the deployment of a 5G network also depends).

Again, **differences between Member States** are at least as significant as differences between Europe and other regions of the world. According to European Commission reports, Germany and Italy both have 5G coverage exceeding that of the United States, as do a number of other Member States<sup>40</sup>. On the other hand, Romania and Belgium still have 5G coverage of around or less than 40% of the population. Mid-band 5G coverage in the US was 85% in 2023 according to Vodafone/Ericsson data, a level matched or exceeded in Europe only by Finland, Italy and Denmark according to Commission

---

<sup>34</sup> Vodafone Group *Why Telecoms Matters* figure 17 (derived from (but some figures different to) Ericsson *Mobility Report 2024* fig 20). Vodafone states EU 5G coverage of 70% at end 2023. However, the European Commission's consultant's report EU27 5G coverage of around 89% (p.12 *Broadband Coverage in Europe 2023*, CNECT/2021/OP/0081). These compare to Vodafone/Ericsson's reported 95% coverage for the US (which the Ericsson report has at 90%). The 5G Observatory reports base station figures for EU, US and China but not coverage data. ETNO's *State of Communications 2024* report refers to number of 5G networks deployed but, again, not their associated coverage. Many national regulators (upon whom some of these European studies also rely) have also faced challenges in assessing mobile coverage, and mobile operators may adopt different methodologies and signal strength criteria when self-reporting.

<sup>35</sup> Ericsson *Mobility Report 2024*, fig 3. The US has higher rates of 5G smartphone adoption, although again the reasons for this are likely to be complex and not solely related to a lack of 5G infrastructure (operators' commercial policies will also be an important factor).

<sup>36</sup> BEREC published a common position on mobile coverage measurement in 2018 ([https://www.berec.europa.eu/sites/default/files/files/document\\_register\\_store/2018/12/BoR%20%2818%29%20237\\_Common\\_position\\_mobile\\_coverage.pdf](https://www.berec.europa.eu/sites/default/files/files/document_register_store/2018/12/BoR%20%2818%29%20237_Common_position_mobile_coverage.pdf)).

<sup>37</sup> An important exception being Austria.

<sup>38</sup> This may be the same rationale in Korea.

<sup>39</sup> See 5G Observatory at <https://5gobservatory.eu/observatory-overview/interactive-5g-scoreboard/>

<sup>40</sup> *Broadband Coverage in Europe 2023*, CNECT/2021/OP/0081, p.12.



data<sup>41</sup>. Again, an important question is why other Member States lag behind Member States such as Italy in 5G deployment.

## Utilisation

The benefits which consumers obtain from new network technologies can be assessed in various ways, one being the volume of data that is conveyed over the infrastructure<sup>42</sup>. Again, there are very significant variances in levels of data consumption between Member States. **Average European data consumption over fixed networks remains generally lower** than in the United States, despite the latter having higher prices for equivalent services<sup>43</sup>.

In contrast, **mobile data consumption is materially higher in some Member States** (such as Finland, Austria and Latvia) than in the United States but comparable in others<sup>44</sup>. Differences within Europe are again very significant – volumes in leading Member States are 3-4x higher than those in the lagging Member States, a similar order of magnitude variation as we observed for prices of equivalent services. Since mobile tariffs are often volume based, the combination of higher prices and higher average consumption volumes means that Average Revenue per User (APRU) of mobile customers is also significantly higher in the United States than in Europe<sup>45</sup>.

## 2.4 Implications for thinking about regulation

The above assessment suggests that, **on some important measures relating to consumer welfare, the European telecommunications industry, and the regulators who oversee it, have performed relatively well since 2002 but that there remain important variations** (by a factor of 3 or 4x in some cases) in performance between different Member States despite the common regulatory approach and common objectives.<sup>46</sup>

European consumers have, on average, tended to pay less for both fixed and mobile services than their counterparts in the United States and less for mobile services than counterparts in Asia whilst obtaining comparable levels of quality (with the exception of 5G network coverage). There is nothing to suggest that European telecommunications networks are any less reliable than those in other regions, nor that operators in Europe are generally less efficient than or have been deprived of the economies of scale available to operators elsewhere.

The European regulatory framework has largely succeeded - or will have largely succeeded if current projections are realised - in its objective of promoting network competition and having competition ensure that productive and dynamic efficiency gains pass to consumers.<sup>47</sup> Where the competitive market has been unable to deliver – as with extending FTTH coverage to more rural areas – the EU

<sup>41</sup> Ibid p.46. We note a large discrepancy between the Vodafone/Ericsson mid-band 5G coverage data for 2023, which records Europe as 25% (the Ericsson report states 30%) and the Commission data on which we rely, which records 50% coverage.

<sup>42</sup> Recognising that productivity and other economic gains will depend upon the type of services represented by this data as well as the volume consumed. This is difficult to measure and something on which we have seen no data.

<sup>43</sup> <https://www.ofcom.org.uk/phones-and-broadband/coverage-and-speeds/international-broadband-scorecard-2023-interactive-data/>: This is reported on a per capita basis whereas per subscriber figures are closer.

<sup>44</sup> OECD Broadband statistics at [https://www.oecd.org/content/dam/oecd/en/topics/policy-sub-issues/broadband-statistics/june-2023/BXP\\_1.13\\_MobileDataUsage\\_2023\\_06.xlsx](https://www.oecd.org/content/dam/oecd/en/topics/policy-sub-issues/broadband-statistics/june-2023/BXP_1.13_MobileDataUsage_2023_06.xlsx): reports on a per subscriber basis.

<sup>45</sup> OECD *Financing Broadband Networks of the Future*, fig 3.

<sup>46</sup> T. Philippon, *The Great Reversal: How America Gave Up on Free Markets*, Belknap Press, 2019.

<sup>47</sup> M. Cave, C. Genakos and T. Valletti (2019), 'The European Framework for Regulating Telecommunications: A 25-year Appraisal', 55 *Review of Industrial Organization*, 47-62.



and Member States have stepped in with public subsidies which appear to have been administered reasonably effectively<sup>48</sup>.

At the same time, **a combination of greater competition between European operators, other regulatory actions<sup>49</sup> and demand side factors have meant that at least some European operators appear to have been generating lower returns on their network investments than their counterparts in other regions or than they have done in the past**, particularly in the recent period. It remains unclear whether these lower returns are associated with lower returns on capital in comparatively more competitive European fixed markets or with lower returns from mobile markets where factors other than market structure or regulation are more likely to explain the differences. It is also uncertain whether the lower returns recently observed will persist into the future, given the many changes and risks associated with the transition from old technologies to new (including but not limited to the potential for new entry, uncertainty around demand for 5G-enabled services, further restructuring and delayering of the industry, new regulation to address security or other concerns and changes in the macroeconomic environment, including higher costs of debt). There are reasons to think that returns may improve generally as capital investment in new networks begins to decline, but there remain risks that they could deteriorate further.

Lower financial returns are unwelcome to shareholders but may not adversely affect market outcomes provided they exceed the cost of capital and firms remain able to raise capital for appropriate investments<sup>50</sup>. Thus far the deterioration in the financial position of some European operators has not obviously affected outcomes because competitive pressures have forced operators to continue to upgrade their infrastructure even when returns from doing so are lower than they would wish. Few if any operators have exited the market in a way which has been disruptive for consumers. We do have some concerns that deployment of 5G mid-band infrastructure and the adoption of 5G devices lags behind other regions, although Europe has some relatively well performing 5G markets and the reasons behind the faster deployment and take-up of 5G technology in other regions of the world are not well understood or necessarily related to lower financial returns.

**Given these various uncertainties about the future trajectory of financial returns, the sources of underperformance and the impact on market performance and consumer outcomes, we recommend that any proposed changes to regulation start with the aim of at least avoiding changes which further contribute to or exacerbate the financial risks that the sector currently faces.**<sup>51</sup> In what follows, we also recommend changes that are intended to reduce regulatory risks which might otherwise contribute to a further deterioration in financial performance by introducing costs which

---

<sup>48</sup> European Commission, Directorate-General for Competition, *The role of state aid for the rapid deployment of broadband networks in the EU – Final report*, Publications Office, 2020, <https://data.europa.eu/doi/10.2763/050506>.

<sup>49</sup> It is important to note that some of the ‘other regulatory actions’ associated with lower industry returns were taken by the EU on the basis of ‘single market’ objectives which are not pursued in other regions of the world. These include the elimination of additional charges for international roaming within the European Union and, prospectively, from international telephone calls within the European Union. So far as we are aware, no serious attempt has been made to quantify ex post the financial impact of these measures for the European telecommunications industry (recognising that such an assessment is very difficult to do).

<sup>50</sup> Again, the cost of capital will vary by operator, given different capital structures and equity betas. HSBC (June 2024) estimate a range of 6.1% to 10.9% in 2024 for a selection of European telecoms operators. This reflects gearing ranging from 23% to 75% and equity betas ranging from 0.31 to 1.07, see BEREC *WACC parameters report 2023*, table 12.

<sup>51</sup> This does not imply that the regulation should now maximise producer surplus to the detriment of consumer or total welfare, but that the regulation should be mindful of the financial position of and risks faced by the sector and aim to ensure a maximization of the long-term welfare of society.



operators can neither anticipate, nor avoid. **It is important to emphasise that we consider that avoiding or at least reducing the risk of unbudgeted and unavoidable costs would have merit irrespective of the current financial outlook of the industry.** In our view, the most significant of these risks arise from costs for retaining spectrum on which operators rely but also include costs to address national security concerns, as some operators experienced during the implementation of the Commission's recommendations to remove Chinese equipment from mobile networks, and other legislative initiatives (such as retail price caps) that have been in the past been imposed outside of the EECC regime.

On the other hand, we do not consider that the evidence of industry performance or market outcomes presented above suggests that a wholesale reversal of the approach to competition and regulation taken since 2002 is required or justified. The evidence shows that network competition in fixed and mobile markets is driving investment<sup>52</sup>, as well as ensuring that efficiency gains are passed onto consumers. We think the reasons for any current shortfall in investment in 5G networks in Europe have yet to be properly diagnosed<sup>53</sup>.

We find that there is no obvious correlation between the size of the population or geography in a Member State and the performance of its telecommunications industry or market outcomes for consumers and no evidence that either consumer outcomes or returns on capital would be significantly enhanced if their services were provided by pan-European rather than national suppliers.

Second, **a consistent theme in our assessment is that, within Europe, performance has been highly variable**, with some Member States ranking amongst the best in the world in terms of prices, network deployment and consumption of services, whilst others lag far behind. Different Member States often excel on different measures. This means that, in addition to asking how European regulation should be changed to improve average European performance relative to other regions of the world, we think attention should be given to better understanding why, when applying the same overall regulatory framework, some Member States have performed so much better than others.

A third observation is that the **wider digital supply chain, of which the European telecommunications sector is a part, is today far more complex than in the past and is likely to become even more complex in the future.** The tendency has been for the telecommunications regulatory framework to focus on the network operators and, in fixed, specifically upon the former State-owned monopolists who supply services on a national basis. This might have been appropriate in 2002, when market power largely resided in the hands of those vertically integrated monopolists. But it is much less likely to be the case today or in the future, when fixed services are being provided by sub-national network operators, some of whom may not be vertically integrated. In future there may be even more significant changes, as there is still considerable uncertainty about how the substitution of proprietary network equipment with software running on generic cloud computing hardware and the introduction of new architectures (including Mobile Edge Computing and the transfer of some compute, including AI, functions into customer devices) might impact the structure of the telecommunications industry, with different operators often taking different approaches. Another change not anticipated by the

---

<sup>52</sup> See, e.g., WIK *Competition and investment: an analysis of the drivers of superfast broadband*, July 2015, European Commission *Exploring Aspects of the State of Competition in the EU* June 2024, Section 2.3.

<sup>53</sup> In this context, 'regulation' excludes spectrum policy which influences the availability and costs of mid-band spectrum, or non-telecoms regulation such as planning policy.



existing regulatory framework is the integration of LEO satellite connectivity into mobile devices. We think it is too early to recommend fundamental changes to the regulatory framework to address these developments and so do not discuss them in detail in this paper, but we do expect that the existing framework will also need to increasingly engage with new types of operators whose activities draw them into its scope.



## 3. Economic Regulation and Competition Policy

### 3.1 The SMP Framework

The **extent and scope of ex-ante regulation under the 2002 telecommunications regulatory framework was, as already noted, intended to be responsive to the extent and scope of competition in various markets.** Where competitive constraints were judged to be sufficient and competition law judged to be effective, then it was expected that ex ante regulation would be withdrawn. On the other hand, ex ante regulation was first required (as a precondition for its later removal) to lower barriers to entry and promote competition in markets that had often previously been dominated by monopoly suppliers.

There were (and are today) two mechanisms by which this process of regulatory intervention followed by regulatory withdrawal was intended to be achieved. The first involved the application of the ‘three criteria’ test by the Commission to identify relevant markets in which ex ante intervention was likely to be required. These were markets characterised by high and enduring barriers to entry and a lack of competition behind those barriers giving rise to features which competition law could not effectively resolve. Over time, the number of markets identified by the Commission applying these criteria has reduced significantly, from 18 in 2003 to 2 today (although we note that national regulatory authorities are able to retain ex ante regulation in markets which do not appear or which have been removed from the Commission’s list and a number continue to do so)<sup>54</sup>.

The second mechanism involved the identification of firms with ‘significant market power’ or SMP within a relevant market. Variations in competitive conditions between Member States or, increasingly, within Member States have meant that some national regulators may identify firms with SMP in a given relevant market whereas others may not. Importantly, the SMP analysis was expected to be undertaken by national regulators in a way which restricted ex ante regulation to those parts of the value chain, or intermediary markets, in which competition had yet to be sufficiently established or into which entry was most challenging. Regulating these markets was intended to enable entry and competition in downstream markets, including but not limited to retail markets. Over time, it was expected that firms would replace regulated inputs that they purchased in intermediary markets with their own assets, thus climbing ‘the ladder of investment’ towards full replication of the former incumbent fixed network operator.

For this reason, the markets that remain regulated today are both upstream fixed input markets, although the nature of the inputs themselves have varied over time and vary between Member States. Specifically, whereas access to an unbundled copper or fibre connection had previously been considered the most feasible upstream input, the EECC, the latest list of Relevant Markets and the Gigabit Recommendation all emphasise that access to civil engineering assets should be the primary focus of ex-ante regulation, with access to other inputs required only if local conditions mean that access to

---

<sup>54</sup> For example, many national regulators continue to regulate Market 3b in the 2014 List (the market for wholesale central access at a fixed location for mass market products) in at least some geographic areas.



civil engineering assets is not available or is unlikely to be effective. In this instance, the scope of regulation has not so much increased or decreased as shifted from one type of input to another.

The rationale for adopting the SMP threshold in 2002 was (at least) twofold: it provided firms and investors with some predictability (and national regulators with established economic and legal precedent) because it was anchored in the established concept of dominance in EU competition law and it meant that, as competition advanced and dominance eliminated, then the scope of ex-ante regulation would necessarily reduce and be replaced by competition law.<sup>55</sup> In practice, once a significant proportion of Member State regulators have failed to identify any operator with SMP in a relevant market then that market would be removed from the Commission's list at the next review.

**The SMP framework has been applied by national regulators since 2002 but there have been a number of developments which have a significant influence on the way this has been done.** First, it has become apparent through the development of European case law and attempts by national regulators under the framework that the concept of **joint SMP** (i.e. of identifying two or more firms as collectively holding SMP in a given market) can be sustained only under very specific and limited circumstances. This has been an issue for some national regulators when considering mobile wholesale markets (which appeared on the Commission's list until it was removed in 2007) and, more recently, when considering fixed broadband markets in which cable operators and former incumbent copper network operators each operate on a national basis.

Second, the European legislators have adopted a number of **other legislative measures** since 2002 which directly or indirectly reduce the scope and application of the SMP framework. The first of these was a regulation directly capping the prices of wholesale international roaming services without any prior requirement to identify SMP or joint SMP. This was introduced after the Commission had included a wholesale roaming market on the list of relevant markets, but national regulatory authorities had declined or been unable to identify operators with SMP within it. More recently, the Commission has imposed retail price caps on international calls (which had previously been unregulated under the SMP regime) and a European-wide cap on fixed and mobile call termination services (which had previously been regulated by national regulators under the SMP regime). In all these cases, services have been removed by legislators from the SMP regime but then subjected to other forms of ex-ante regulation without any obvious prospect of those other forms of regulation being responsive to changes in competitive conditions. This means that the consequent reduction in the number of relevant markets (3 were withdrawn as a result of these actions) is not an indication of changing competitive conditions but simply an indication that the European legislators decided to impose ex ante regulation by other means.

Similarly, legislators adopted the Broadband Cost Reduction Directive in 2014, which imposed obligations upon owners of certain civil engineering assets, including ducts and poles, to provide access to third parties on reasonable terms upon request. Ducts and poles have also become an important intermediary market under the SMP regime since 2010, enabling new entrants in many Member States to deploy FTTH networks by utilising these assets to reduce deployment costs. A question has therefore arisen as to whether the Broadband Cost Reduction Directive, or its successor the Gigabit Infrastructure Act, should pre-empt the application of the SMP regime in a market (or sub-

---

<sup>55</sup> A. de Stree, 'The Integration of Competition Law Principles in the New European Regulatory Framework for Electronic Communications', *World Competition* 26(3), 2003, 489-514.



market) for access to civil engineering assets. To date, national regulators have chosen to apply the SMP framework when regulating access to the civil engineering assets of former incumbent copper network operators and to refer to the Directive when access is sought to assets owned by non-telecoms operators, such as utility companies. The reasons for this include first, that in some Member States, access to civil engineering assets under the SMP regime preceded the implementation of the Broadband Cost Reduction Directive and existing arrangements have continued to apply and, second, that most national regulators consider that the Directive, which is intended to apply to a wider set of actors and which allows them to set prices and other terms only if a dispute is referred to them, will not be effective when applied to a vertically integrated telecoms operator that is also competing in the downstream market<sup>56</sup>. In principle, if access to the civil engineering assets of the incumbent operator were to be effectively provided under either regime (and both are overseen by the same regulatory body) on very similar terms, then operators and regulators ought to be indifferent as to which regime is applied. We discuss this further below.

### Criticisms of the SMP Framework

There have been various criticisms of the SMP framework and its application. Some relate to what we might call inherent features and others to how the framework has been implemented in practice. We recognise that sometimes behavioural change in the way in which regulations are implemented can be difficult to achieve without making changes to the regulations themselves.

One feature of the existing regime is its reliance upon first **defining markets** in which to identify firms with SMP. One criticism of this approach is that the task of identifying markets is undertaken by the European Commission at a generic level, rather than by reference to the specific conditions prevailing in any particular Member State. Although not a necessary consequence of this approach (since national regulators are able to propose additional markets if they consider that local conditions require it and the fact that a market is one the list requires a national regulator to undertake a market review but does not oblige it to impose ex ante regulation if it concludes that local conditions mean none is required), it is argued that the practical consequence of this approach is that it creates a strong presumption as to which markets will be regulated and which not without actually considering the conditions of competition in any Member State. It may also mean that national regulators themselves consider it unnecessary to undertake more than a cursory examination of the ‘three criteria’ test if the market already appears on the Commission’s list. In a situation in which the Commission has not defined a market with regard to local conditions and national regulators consider it unnecessary to do so then no proper assessment of competitive conditions – of the kind required in a competition law case – will be undertaken.

If this critique is accepted, then it is difficult to know whether it has led to excessive or insufficient ex ante regulation. That would require knowing what would have happened if the ‘three criteria’ test had been properly applied having proper regard to local circumstances in each case. We note that, in addition to some national regulators proposing and the Commission accepting markets which did not appear on the Commission’s list<sup>57</sup>, there have also been instances of national regulators withdrawing

---

<sup>56</sup> Exceptions include Bulgaria, Romania and Sweden. See WIK *Support Study for the Review of the Broadband Cost Reduction Directive*, 2023, p. IV.

<sup>57</sup> For example, the French regulator notified a market for SMS termination on a number of occasions since 2006, despite it not being on the List.



ex ante regulation from markets which were on the Commission's list because they considered that local conditions meant they did not satisfy the 'three criteria' test. Furthermore, there have been instances of the European Commission (but not, so far as we are aware, European Courts) challenging conclusions from national regulators on the grounds that the local conditions do not meet the 'three criteria' test for a market which appears on the Commission's list<sup>58</sup>. [ Any assessment of this kind would also need to presuppose that the three criteria adopted in 2002 are appropriate and ensure that ex ante regulation is only applied when it is required. The first criterion (presence of high and non-transitory barriers to entry) may be relatively uncontroversial but the second (as to whether the market will tend towards effective competition within the review period) requires an element of prediction and judgement and the third (insufficiency of competition law) depends upon an assessment of the adequacy and effectiveness of the competition law regime in a particular Member State, on which there may be differing views.

So far as the **SMP threshold** itself is concerned, national regulators have argued that it is ill suited to oligopolistic markets in which competition concerns may arise but for which it is very difficult to sustain a finding of joint SMP or joint dominance.<sup>59</sup> Again, it could be argued that this will result in insufficient ex ante regulation if an inability to find joint SMP forces regulators to conclude that no operator has SMP, but it could also result in regulation that is inappropriate and distortive (and possibly excessive) if the consequence is instead that national regulators retain ex ante obligations on former incumbent operators in lieu of being able to impose obligations on two or more operators<sup>60</sup>. As already noted, there have also been instances where an inability to establish joint SMP has not served to limit ex ante regulation (as might have been envisaged) but simply led European legislators to pick up other legislative tools (as in international roaming) or national regulators to adopt other regulatory instruments (as in the imposition of MVNO obligations in spectrum licenses<sup>61</sup>). In these circumstances, the various safeguards which are designed into the SMP framework (such as the need for periodic market reviews and the withdrawal of regulation as competition advances) are bypassed. This seems a very unsatisfactory state of affairs, particularly when the SMP regime is intended to provide a degree of regulatory predictability and discipline.

It also seems clear that the SMP regime has become more complex to apply as competitive conditions in fixed markets **diverge in different geographic areas** in many Member States recent. To date, national regulators have (without objection from the Commission) taken different approaches in whether to respond to this by defining different geographic markets and finding SMP within them or

---

<sup>58</sup> The Bulgarian regulator concluded in 2019 that the wholesale local access market did not meet the 'three criteria' test (whilst market 3a remained on the List of Relevant Markets), and the European Commission concluded the same in 2024 in relation to Malta (on the grounds that the second criterion of 'tendency towards effective competition' was not met).

<sup>59</sup> BEREC, *Report on Oligopoly analysis and regulation*, December 2015, [https://www.berec.europa.eu/sites/default/files/files/document\\_register\\_store/2015/12/BoR\\_%2815%29\\_195\\_Draft\\_report\\_on\\_oligopoly\\_analysis-regulation.pdf](https://www.berec.europa.eu/sites/default/files/files/document_register_store/2015/12/BoR_%2815%29_195_Draft_report_on_oligopoly_analysis-regulation.pdf).

<sup>60</sup> Imposing obligations on a single operator could be considered more intrusive than imposing obligations on two or more operators if, for example, the single operator was then also subject to detailed regulation of the terms on which it (as a monopoly supplier) provides access to its network. An alternative might be to require two operators to supply access to their respective networks, but not to regulate the terms on the assumption that competition will then ensure that the terms will be reasonable (i.e. that operators had been able to tacit collude in refusing to provide access to their networks but would be unable to tacit collude over the terms on which they do so).

<sup>61</sup> We recognize that conditions in spectrum licences are subject to limitations under the EECC but the point remains that this has allowed for the imposition of obligations independently of the SMP regime.



by applying different remedies in different areas but retaining a single national geographic market definition with a single SMP firm within it.

We think there has been a reluctance by some national regulators to formally redefine markets to remove or reduce regulation for fear that once a geographic area falls outside of the regulatory framework, it will be difficult or impossible to reintroduce it if conditions were to change later (i.e. a market that was thought to be tending towards competition might not subsequently do so). This could mean that some operators are designated as having SMP on a national basis for longer than might be justified, even if the more onerous remedies are limited to a limited geographic area. This concern arises because the SMP framework allows national regulators considerable discretion in how they define the geographic scope of markets, SMP within them, and the differential application of remedies. On the other hand, we should also recognise that the increasing use of sub-national or localised markets and remedies has been an important means by which many national regulators have withdrawn more onerous regulatory obligations from SMP operators in some geographic areas in recent years (albeit whilst retaining those obligations in other areas).

### Replacing SMP with 'bottleneck facilities'

Given these criticisms of the SMP framework, there is a question of whether changes to the threshold for ex ante regulation should be considered. One proposal is that the two step approach of defining markets and identifying firms with SMP within those markets should be replaced by a single step approach which involves identifying 'bottlenecks'. Our Economic Regulation paper suggests that a **'bottleneck' would need to satisfy three conditions which are similar but not identical to the concept of an 'essential facility'** (which was for a time used during the early stages of telecommunications market liberalisation in Europe in the 1990s). Some of these conditions are **also similar in character to criteria in the 'three criteria' test** that is currently applied when defining markets for ex ante regulation. This should not be surprising as the aims of ex-ante regulation would remain broadly the same even the tools used to achieve them were to change.

The Economic Regulation paper proposes that an initial approach as to how to define a bottleneck for *ex ante* purposes could proceed by **identifying national or sub-national infrastructures or a set of physical or intangible assets** (or a combination of both) which provide access to end-user customers. which would satisfy the **following cumulative criteria**:

1. It is necessary from a functional point of view to provide an effective alternative service provision in the electronic communications sector, taking into account recent technological developments;
2. It is not effectively contestable by access seekers given the minimum cost-efficient scale that would be required to replicate the bottleneck and the lack of foreseeable technological developments that would erode the bottleneck qualities identified under criterion (a); and
3. It is not subject to another viable and functioning access alternative, irrespective of the legal origins of the access options available; in other words, commercially available access options, obligations imposed under symmetric regulation, remedies imposed under competition law and merger control, and imposed under licence/authorization conditions.



Given the fact that economic regulation aims to protect long term consumer welfare, it would be important that the bottleneck test is applied, and obligations are imposed only when there is no sustainable competition on the retail and wholesale markets.

This approach might be described as **enabling routes to adjacent markets**.

The first condition is that such a route is required to compete, and that an access seeker could not, for example, bypass or disintermediate the controller of the bottleneck.<sup>62</sup>

The second condition – which also echoes the first criterion in the ‘three criteria’ test - is that the number of routes cannot be reasonably expanded in the foreseeable future.

And the third condition – echoing the second criterion in the ‘three criteria’ test - is that there are insufficient alternative routes to mean that vertical foreclosure is a viable strategy for the controller of the facility in question.

This leaves the question of how many alternative routes need to be available for the facility in question not to be designated as a bottleneck unresolved. The answer could vary depending on the circumstances or there could be a presumptive rule.

Advocates of the bottleneck approach make several points.

First, it has the potential to support a more surgical and granular approach to ex ante regulation since the analytical focus is directly on facilities, in particular locations rather than being on the market position of the firm as such. An operator might control some bottleneck facilities in particular locations but have other facilities which do not qualify as bottlenecks. As noted earlier, similar attempts at localised regulation have been made under the existing SMP framework by differentiating between remedies, but this is becoming increasingly complex, can lead to different national regulators taking different approaches and can risk a degree of regulatory inertia. The common application of a bottleneck test by all national regulators might lead to greater consistency and mean that the choice between intervening<sup>63</sup> and not intervening becomes more binary<sup>63</sup>.

Second, a potentially important feature is that **several bottlenecks may co-exist in oligopolistic markets** and so regulators could impose obligations in circumstances in which they would, under the SMP framework, otherwise need to find joint SMP. This would depend upon how the bottleneck concept is defined (for example, the number of alternative facilities that were required before the bottleneck was removed). But it is difficult to see how the existing SMP framework could be retained and enable interventions in oligopolistic markets unless the European Courts’ assessment of the conditions required to establish joint dominance were to change significantly, which does not appear

---

<sup>62</sup> See P. de Bijl and N. van Gorp, *Digital Gatekeepers: Assessing Exclusionary Conduct*, October 2019, <https://archieff28.sitearchief.nl/archives/sitearchief/20220224195417/http://www.government.nl/binaries/government/documents/reports/2019/10/07/digital-gatekeepers/Digital+Gatekeepers.pdf>.

<sup>63</sup> If the choice does become more binary then there will still be questions about how a regulator might reintroduce ex ante regulation at a later date if the market were to change in a way that introduced new bottlenecks (it may need to be easier to do so than under the existing SMP framework) and about what evidence a regulator would require before deciding that a bottleneck no longer existed (i.e. how ‘prospective’ would the availability of a sufficient number of alternatives have to be to exclude the possibility of a bottleneck). If adopted, we would also need to consider whether bottleneck designations would also be subject to periodic reviews, as SMP designations currently are under the Article 67 market review process, or some other process. The question of remedies also remains: some bottlenecks may require more onerous remedies than others.



likely. It is possible that an additional threshold for intervention in oligopolistic markets could be introduced alongside the SMP or single dominance framework, but it is not clear how the coherence of the regime (including the benefits of close alignment to competition law) could be preserved by doing so. If oligopolistic markets are to be addressed, then we think it would be better to revisit the fundamental threshold for intervention and adopt a new threshold that can be consistently applied by all national regulators rather than introduce additional thresholds that would then have to operate alongside the existing SMP framework.

We recognise that there are also potential disadvantages to the bottleneck approach. The first is that the concept is not easy or straightforward to define and, without a robust definition, it will be difficult to apply or to apply consistently. However, if it is defined, the concept will be legally unprecedented and unsupported by existing EU jurisprudence in the way that SMP was supported by the jurisprudence on dominance when it was introduced in 2002. A **period of regulatory uncertainty will arise** until principles are established and whilst national regulatory authorities work out how the new regime is to be operationalised. It seems likely that the legislators and the European Commission will need to provide **detailed guidance** to regulators in charge of administering the new regulatory regime in order to ensure legal predictability and consistency of application, likely in new legislation but supplemented by guidelines. There will also no doubt be a role for the European Courts and a need for transitional arrangements to avoid disruption or unintended consequences as national regulatory arrangements migrated from the existing framework to the new framework. It would need to be shown that the benefits of changing to the bottleneck approach were sufficient to justify the costs of doing so.

## Replacing SMP with symmetric regulation

A different approach which would also dispense with defined markets and SMP would be to rely upon 'symmetrical' regulation which imposes obligations on all firms irrespective of their market position or competitive conditions.<sup>64</sup> The existing SMP framework, as amended in the EECC, already requires national regulators to take account of the effect of symmetric regulation of civil engineering infrastructure under the Broadband Cost Reduction Directive, now replaced by the Gigabit Infrastructure Act (GIA)<sup>65</sup> or symmetric provisions of the Code itself.<sup>66</sup> However, to date this has not stopped most national regulators from supplementing symmetric regulation with additional obligations that apply only to an operator designated as having SMP.

An important advantage of symmetric obligations (whether under the GIA or the EECC) is that they dispense with the need for the regulator to identify individual firms to which the regulation applies and that it will generally apply nationally, thereby avoiding the need to distinguish between geographic areas which are more competitive and those which are less competitive. In this sense it is simpler to implement but also wider in scope and so potentially more burdensome than regulation under an SMP or the bottleneck approach. The bottleneck approach also dispenses with the need to designate individual firms, as it focuses directly upon the replicability of assets required to participate in related markets. In this sense, the symmetric approach is wider than SMP by applying to all assets

---

<sup>64</sup> Besides dealing with access and pricing issues, symmetric regulation may also deal with non-economic issues such as operational processes.

<sup>65</sup> See paragraph 18 of Commission Recommendation 2024/539 of 6 February 2024 on the regulatory promotion of gigabit connectivity, OJ [2024] L 2024/539.

<sup>66</sup> EECC, Article 61.



irrespective of the market position of the firm, whilst the bottleneck approach is narrower than SMP by applying to a sub-set of assets only.

If the GIA were to prove sufficient to ensure competition in downstream telecommunications markets, then the rationale for additional asymmetric regulation – at least of civil engineering infrastructure - would seem weak. However, the GIA is as yet untested and the record of its predecessor, the BCRD, was on the Commission’s own admission not impressive<sup>67</sup>. As important, whilst this approach may be appropriate for regulating access to civil engineering assets, it is very difficult to see how it could be extended to other assets which might need to be regulated in future, such as network software.

We are therefore not persuaded by arguments that symmetric regulation (supplemented by the application of general EU competition law) removes the need for an asymmetric regulatory regime to co-exist alongside it. We are also uncomfortable with overly relying upon symmetric regulation which extends and increases the regulatory burden on the industry as whole for an unlimited duration. We would prefer a more targeted approach (whether using SMP or the bottleneck approach) which might impose more burdensome (but necessary) obligations on only a sub-set of firms (or a sub-set of the assets of those firms), potentially for a limited period of time.

### Better implementation of the existing SMP regime

Another proposal is to retain the SMP regime but make changes intended to improve the way in which it is implemented by national regulators. To address our concerns about the application of the ‘three criteria’ test, the **European Commission’s list of relevant markets could be dropped, with national regulators instead required to justify each decision on the basis of market failures** (as an ex-post competition law assessment would be required to do) and the ineffectiveness of a competition law intervention. This would ensure that a proper economic analysis, having regard to specific local conditions, is always undertaken. By removing any presumption about which markets should be reviewed and are susceptible to ex ante regulation, it might make it more difficult for national regulators to sustain an SMP finding in markets which would otherwise appear on the Commission’s list. But it might also become easier to sustain an SMP finding in markets which might not otherwise appear on that list (recognising that this is already possible and, as noted earlier, has been done in the past). This approach might also better reflect the continued divergence in competitive conditions and market characteristics which we observe across Europe (in relation to fixed telecommunications markets).

Alternatively, (or in addition) the approach to the treatment of geographic differences in competitive conditions could change, with all national regulators being required to **address geographic differences when defining markets and assessing SMP rather than when formulating different remedies**. This would require all national regulators to define geographic markets at a more granular level than some do today and to identify those operators holding SMP within particular geographic markets (or finding the market to be effectively competitive) before remedies are considered.

---

<sup>67</sup> We recognize that criticism of the Broadband Cost Reduction Directive included issues such as permitting which are not relevant to the question of whether it effectively ensured access to civil engineering assets. However, there was some evidence that the dispute resolution provisions did not always work well. We note that the Bulgarian regulator has recently proposed to reintroduce SMP obligations for access to civil engineering assets as a result of its experience in previously relying upon the Broadband Cost Reduction Directive.



Whichever approach to the threshold for intervention is adopted, we would expect that **changes in technology will continue to influence the remedies that will be required to promote competition** (as the transition from copper to fibre networks has, for example, led to a greater focus on civil engineering assets in recent years). We would expect that network virtualization will lead to a greater emphasis on access to appropriate software interfaces rather than or in addition to requiring physical access to ducts or fibre. Remedies that involve access to network APIs may in future have more in common with obligations in the Digital Markets Act than the remedies applied under the existing Electronic Communications Code. We recommend that BEREC give this matter further consideration.

## 3.2 Accelerating migration from copper to fibre with targets and financial support

### Supply side measures

We think the **benefits of retiring copper networks when fibre is available are well understood** and include a contribution to sustainability and security goals as well as avoiding the duplication of costs. Existing arrangements envisage that the timing of retirement will be a commercial decision for the owners of the copper network, who will generally benefit from reductions in costs. The 2024 Gigabit Connectivity Recommendation provides national regulators with guidance on how the migration process is to be undertaken and how regulated wholesale prices might be used to incentivise both end-users and access seekers to migrate from copper to fibre networks when the opportunity arises.<sup>68</sup> Pricing signals may be sufficient to induce the majority of users to switch quickly but it will be important that the transition is not delayed by a small minority of users who remain reluctant to switch (or by access seekers who wish to delay the migration).

Although setting a regulatory target for the retirement of the copper network may encourage some users to switch earlier or otherwise protect network operators if they force users to do so,<sup>69</sup> **a common European target or deadline will not assist** those operators able to retire networks well before that date and will not be met if no alternative fibre network is available at the location in question. Our Economic Regulation Paper also cautions that a binding target for retirement might be subject to legal challenges which might make it difficult to implement or enforce, whilst a non-binding target would serve little or no purpose.

When the owner of the copper network is also the owner of the fibre network, then the incentives to retire networks ought to be straightforward and targets would be unnecessary. However, the owner of the copper network may have different incentives when the fibre network to which users could migrate is owned by another firm. In this case, migration would involve the owner of the copper network becoming a wholesale customer of the other firm rather than transferring customers to another network that it owns. In such circumstances, the owner of the copper network might prefer to delay the closure of the copper network until it has deployed its own fibre network in the relevant

---

<sup>68</sup> Commission Recommendation 2024/539 of 6 February 2024 on the regulatory promotion of gigabit connectivity, OJ [2024] L 2024/539.

<sup>69</sup> Similar considerations may apply to the closure of 2G and 3G networks, although the efficiency gains here are likely less significant, and the migration incentives are less complex.



area or may simply not wish to migrate at all. In this case, a regulatory target is likely to be required to oblige the owner of the copper network to retire it.

We think there is a case for doing this<sup>70</sup> but recognise that the **owner of the copper network will incur economic losses if it is obliged to retire assets which have a residual life and for which it will likely need to be compensated** (on a case-by-case basis). Without compensation, we consider that the risk of legal challenge referred to above will be very high. One approach would be that the recipient fibre network, which would be the main beneficiary of the closure of the copper network, is required to compensate the owner of the copper network. However, this is likely to distort competition between that owner and other users of wholesale fibre products with whom they compete. This is why we think some form of public funding or State Aid may be required to address this issue. We emphasise that consumers as a whole will still benefit from the sustainability and efficiency gains of rapidly retiring copper networks, even if some individual firms face costs for which they may need to be compensated.

Our Resilience and Security paper also highlights the security implications of continuing to operate infrastructure and equipment that is no longer supported or updated by vendors. Non-supported networks are a potential source of vulnerability to cyber and other attacks. **A security policy should aim to accelerate the retirement of non-supported telecommunications assets in Europe**, both fixed copper networks and mobile technologies such as 3G. Both are likely to require regulatory intervention and financial support to achieve.

## Demand side measures

**The transition from copper to fibre networks ought, in a market environment, to be largely led by users themselves and not by regulatory targets.** Some Member States with reasonable levels of FTTH deployment nonetheless have relatively low adoption levels whilst others have comparatively high levels (i.e. over 80% of households have taken FTTH connections when available)<sup>71</sup>. This has obvious implications for the financial returns generated by those assets and expectations for returns on additional investments. Greater understanding of the large variances in adoption rates between Member States would, we think, be useful and ought to inform strategies to lower barriers to adopting new technologies.

This might include, as our Economic Regulation paper suggests, the **use of State Aid to provide users with demand side incentives to adopt new technologies more quickly and in greater numbers.** We would generally prefer to use public funds to support ‘demand pull’ measures to extend network coverage over ‘supply push’ subsidies since the main benefits of a new network are driven by usage rather than by its deployment. Encouraging users to actively choose and adopt new technologies is likely to realise larger economic benefits than forcing them to migrate to them. We would therefore

---

<sup>70</sup> It is sometimes argued that this deprives remaining copper network users of the choice and removes competition between the copper network owner and the alternative fibre provider. We agree that any closure of the copper network will deprive those who still use of the ability to do so – this is an inevitable consequence of the transition, but one which is necessary if the costs of duplication (which are likely to be borne by all users) are to be avoided. Whether removing the copper network will have a material impact on competition depends on whether copper-based networks impose significant competitive constraints on fibre networks. Some national regulators (e.g. the Swedish) have already concluded that they do not, but this depends on local circumstances and evidence.

<sup>71</sup> FTTH Council – FTTH/B Market Panorama 2024. Spain has an FTTH take up rate (as a % of households passed by FTTH) exceeding 80%, whilst Greece is around 20%. Differences reflect the length of time FTTH has been available, but also copper switch off activity and other factors such as the capability of non-FTTH networks and marketing activities by operators.



encourage the Commission and regulators to continue to focus on increasing the utilisation of FTTH-enabled networks – including in particular by SMEs - even after copper networks have been retired. The Economic Regulation paper suggests this might extend to State support for new types of content or service which would be conveyed over these networks, although we think that more collaborative relationships between network operators and content and service providers (including public service providers) ought also to be encouraged.

### 3.3 Measures to lower industry costs

Our Economic Regulation paper discusses various measures to lower telecommunications industry costs. We wrote earlier that the first objective of any rethinking of the regulation ought to be to avoid unbudgeted costs given uncertainties about the current financial position and outlook of the European telecommunications industry. Measures to further reduce costs offer an obvious area of focus, although it is important to recognise that whilst they benefit telecommunication operators, they may also impose costs on other sectors or members of society which should not be ignored. We also recall that whether any reduction in costs contributes to higher financial returns for the industry or benefit consumers will depend upon the extent to which competition forces operators to pass savings onto end customers rather than retain them for themselves.

#### Smarter spectrum management

The most immediate and important issue for us relates to the costs of spectrum acquisition and retention.<sup>72</sup> There are many aspects to spectrum licensing and factors which drive costs.<sup>73</sup> It seems obvious that **we need a regime which allocates spectrum efficiently and ensures that scarce resources are utilised appropriately**. However, we are not convinced that pricing mechanisms have performed this function very effectively in recent years and it appears to us that prices have largely been used by Governments to extract revenues from existing holders of spectrum rather than produce changes in ownership or use that are demonstrably more efficient (since spectrum has largely remained under existing ownership and utilised for existing purposes). Spectrum trading has not been a significant feature of the industry or had a significant impact upon market outcomes since it has been authorised in Europe.

**An alternative to reliance upon price mechanisms would be to apply a ‘use it or lose it’ principle.**

The details would need to be worked out (such as whether the assessment would be done on a national or sub-national basis) but would mean that holders of spectrum (whether telecoms operators or others) would be required to demonstrate adequate utilisation of the resource or be directed either to share, sub-let or to divest spectrum that was found to be under-utilised. If periodic auctions were no longer the mechanism used to deliver allocative efficiency, then we also see a strong case for moving to perpetual or very long duration spectrum licences<sup>74</sup> rather than the periodic retendering of spectrum which has occurred in the past.

---

<sup>72</sup> The Commission White Paper calls for more EU coordination for spectrum management, p.13.

<sup>73</sup> M. Cave and W. Webb, *Spectrum Management: Using the Airwaves for Maximum Social and Economic Benefit*, Cambridge University Press, 2015.

<sup>74</sup> By ‘very long duration’ we have in mind 40+ years. The difference between this and a ‘perpetual licence’ (which can still be reclaimed by Governments under exceptional circumstances) is not just semantic but may affect the accounting treatment of the asset and, potentially, the ability to use it as collateral.



Taken together, our recommendations would represent a major change in approach to licensing but would ensure that **existing holders of spectrum acquire both new rights (to retain spectrum beyond the foreseeable future) and new obligations (to use it efficiently or lose it)**. We envisage that this approach would apply to spectrum held by individual firms, such as mobile operators, but also to spectrum that is allocated on collective basis to groups of users that operate private networks<sup>75</sup>. In the latter case, the assessment is more difficult because individual users may use spectrum efficiently but the collective of users may not be. Further thought is required to determine how the principles would be applied to such collective user groups.

Implementing these proposals would also require Member States and national regulators to approach spectrum management in a different way. **Instead of working to design complex auctions<sup>76</sup>, regulatory authorities would need to spend more time and effort understanding how existing spectrum is being utilised** at any given point in time and assessing the credibility of claims by both prospective and existing owners of spectrum. Instead of using prices to assign spectrum, authorities could assign on the basis of commitments to provide coverage or otherwise invest in improving the quality of the infrastructure on which the spectrum is deployed.<sup>77</sup>

Once assigned, regulators would need to be much more active in monitoring how spectrum is being utilised and would be expected to intervene if this revealed allocative inefficiencies. Regulators will need sufficient resources and expertise to undertake these utilisation assessments and enforce the rules properly. If they do so, then we think such a ‘use it or lose it’ principle could also make an important contribution to sustainability objectives.

Such a regime will only work if regulators have sufficient legal powers and are prepared to hold spectrum owners to their obligations. In the past, coverage commitments have been offered by operators and not met, but few sanctions have followed from it<sup>78</sup>. Requiring an operator to divest spectrum that is underutilised may be disruptive to some users and will likely be resisted in the courts.<sup>79</sup> What constitutes ‘inefficient utilisation’ and over what time period can also be argued about at length. However, if underutilised spectrum cannot be speedily and efficiently reassigned, then our

---

<sup>75</sup> The question of ‘set asides’ of spectrum for particular groups of users has become controversial in some Member States. We have no prior view on the merits of such set asides, which should depend on whether they are more or less likely to contribute towards the better utilisation of the spectrum assets.

<sup>76</sup> The allocation of new spectrum bands would still need to be undertaken from time to time. Many of these bands will be in millimetre wave frequencies and suitable for localised deployments rather than national coverage.

<sup>77</sup> We recognise that regulators may wish to avoid ‘beauty contests’ which are frequently challenged in litigation. One approach might be to use price-based auctions to assign spectrum but then use a reverse auction to establish rebates in return for coverage or other commitments, as was done in Austria for 5G spectrum in 2020. See R Marsden (2024) *Round by Round: Learnings from the first 35 years of spectrum auctions*, p.119 and also W Webb and S Temple (2024) *Emperor Ofcom’s New Clothes – How the market approach to radio spectrum failed the country’s mobile infrastructure and how to turn it around*.

<sup>78</sup> There are various issues with enforcement: it is often difficult for regulators to measure coverage with accuracy or in a way that would support a non-compliance decision that could be legally challenged; the obligations themselves are not well specified; it is not obvious that financial penalties will incentivize and support a licence remedying non-compliance; withdrawing a spectrum licence is likely to disrupt services for end-users. See, for example, Electronic Communications Committee Report 231 (2015) *Mobile coverage obligations* at <https://docdb.cept.org/download/1204>.

<sup>79</sup> We do exclude the use of the price mechanism altogether. For example, we think it possible that network operators holding spectrum which they do not use efficiently would anticipate ‘losing it’ via the regulator and so might pre-empt that by trading it to another party. In this way they would obtain some income from it. Under the ‘use or lose it’ regime the holder would not obtain any compensation for loss. Our proposal may therefore actually increase the volume of spectrum that is traded in Europe.



approach will not achieve its objectives, and European legislators will need to be satisfied that a different regime will ensure the more efficient use of spectrum before adopting it.

Our proposals would mean network operators avoid the costs of acquiring or retaining spectrum (whether via auction or spectrum fees) which they have faced in the past. As noted earlier, there remains some uncertainty about the impact of spectrum costs on industry performance, either in terms of prices or network investment. To the extent that it is negative, then we think removing these costs is consistent with our requirement that any changes we propose reduce risks of unbudgeted costs. Whether the existing operators end up holding more or less spectrum than they would otherwise hold under existing arrangements would depend upon how efficiently they utilise it in future.

## More regulatory harmonisation to reduce cross/border operations

Next to the ‘core’ telecommunications regulations (EECC, OIR, GIA), the telecommunications operators are also subject to a number of other horizontal laws whose divergences across the Member State increase the costs of doing business in multiple Member States.<sup>80</sup> Those laws related to consumer protection (as explained in the next section), but also, for instance, on lawful interception, data retention or localisation of security operations centres.<sup>81</sup> **Increased harmonisation of those laws may reduce compliance costs and allow the use of more unified systems across Europe**, most likely in the provision of services to multi-national customers.

## 3.4 Competition policy in telecommunications

With regard to antitrust policy, our Economic Regulation paper notes that the revised Horizontal Co-operation Guidelines<sup>82</sup> recently issued by the Commission do not fully anticipate the technological changes, particularly network virtualisation, to which we referred earlier. This is regrettable but we also recognise that the implications for how co-operative arrangements might be structured in future, and what competitive effects they might have, remain uncertain today. The Commission may be prepared to approve **new forms of co-operative arrangements** if the industry, or individual firms within it, were to radically restructure their operations.<sup>83</sup> For example, sharing physical assets - which might have been problematic in the past - may not be so if they can now be ‘sliced’ into logically separated virtualised networks which are controlled by competitors. Once the Commission has considered a number of such cases, it may be possible to draw general conclusions which can be incorporated into revised guidance. This would then allow the industry to understand how the Commission will respond to new forms of co-operative arrangement and might encourage their pursuit. The first step here rests with the industry itself.

---

<sup>80</sup> The Economic Regulation paper also references the extensive range of telecommunications-specific consumer protection measures in the Electronic Communications Code and suggests that, under current market conditions, it may be appropriate to revisit these and rely instead upon horizontal measures. These issues are discussed in further detail by In the Consumer Policy paper and in the next section of this one.

<sup>81</sup> Commission White Paper, p.14.

<sup>82</sup> Commission Guidelines of 1 June 2023 on the applicability of Article 101 TFEU to horizontal co-operation agreements, O.J. [2023] C 259/1.

<sup>83</sup> These new forms of co-operative agreements could also be vertical in nature.



With **regard to merger control**, our Economic Regulation paper suggests various ways in which the European Commission's approach to assessing horizontal mobile mergers might be refined, including **greater consideration of dynamic efficiency benefits and emerging or new competitive constraints**. Given the flexibility of EU competition law, we think these can probably be accommodated within the general existing analytical and legal framework and should continue to be considered on a case-by-case basis by reference to the facts (most of which are held and should be presented by the merging firms themselves).

We also think that, when assessing mergers of telecommunications operators, **security and sustainability considerations ought to feature more prominently in competitive assessment** (without necessarily being decisive). We recognise, however, that this may require a wider change in competition policy rather than being a matter specific to telecommunications<sup>84</sup>. For instance, mergers may reduce the diversity of infrastructure assets, which could adversely affect resilience but may also improve the merged operator's ability to invest in security or other measures. Consolidation of networks and reducing duplication is, all else the same, likely to reduce energy consumption and contribute to sustainability but may also adversely affect competition.

The wider point here is that competition authorities and policy makers in general should not disregard the impact of industry structure and financial position upon its capacity to achieve objectives in relation to security and sustainability or the impact that imposing obligations in relation to security or sustainability might have upon the industry's structure and financial position. These issues have tended to be considered separately in the past.

---

<sup>84</sup> We note that the *Political Guidelines for the Next European Commission 2024-2029* of Ursula von der Leyen, the re-elected President of the European Commission, states that a new approach to competition policy is required so that, amongst other things, merger assessments should take 'innovation and resilience' into account. p.7.



## 4. User Protection and Net Neutrality

### 4.1 Consumer protection measures

The success of the 2002 regulatory framework in promoting competition and breaking down monopolies is in part due to what the End-users Regulation paper calls the ‘demand side liberalisation measures’ which are intended to allow consumers both to make informed choices between suppliers and to be able to act upon them. The EECC contains a list of measures which are specific to consumers in telecommunications markets, and which are either ‘liberalisation measures’ or intended to protect consumers irrespective of whether markets are competitive or not.<sup>85</sup> These measures co-exist alongside other horizontal measures such as the Unfair Contract Terms, Unfair Commercial Practices and Consumer Rights Directives which apply to consumers in any sector<sup>86</sup> as well as the Digital Content Directive.<sup>87</sup>

**There is a tendency for consumer protection measures to accumulate and to diverge as national politicians in different Member States respond to different public concerns, often in a fairly ad hoc manner.** The EECC attempted to impose some constraints<sup>88</sup> but the End-users Regulation paper suggests yet more rigor is needed. One reason for this is that there is always a danger that this form of regulation will limit differentiation on quality and leave operators to compete only on price. Regulation that may be justified when the concern is exploitation of monopoly power may be inappropriate when firms are seeking to compete by offering services on differing terms and when consumers make choices based on differences in quality (as data in the End-users Regulation paper suggests many do). It may also be inappropriate once consumers have acquired experience of and confidence in exercising choices in telecommunications markets, with 60% of the European population now having switched telecommunications provider at least once (as well as being inappropriate to well informed business users).

The End-users Regulation paper suggests **areas - such as for information contained in contracts and access to customer services - where it may now be time to remove sectoral consumer regulation** and instead rely upon horizontal laws and competition.<sup>89</sup>

On the one hand, if measures are to be retained, then their application should be limited and harmonised by EU law. Some measures in the EECC have not been implemented in some Member States and their effectiveness has never been properly assessed.

On the other hand, one area where national regulators might do more is in the **development of tools to enable users to better assess aspects of quality**, including but not limited to network speeds and availability. This might also encourage operators to focus more upon resilience as a dimension of

---

<sup>85</sup> EECC, Articles 98-107.

<sup>86</sup> Council Directive 93/13 of 5 April 1993 on unfair terms in consumer contracts, OJ [1993] L 95/29 as amended; Directive 2005/29 of the European Parliament and of the Council of 11 May 2005 concerning unfair business-to-consumer commercial practices in the internal market, OJ [2005] L 149/22, as amended; Directive 2011/83 of the European Parliament and of the Council of 25 October 2011 on consumer rights, OJ [2011] L 304/64, as amended.

<sup>87</sup> Directive 2019/770 of the European Parliament and of the Council of 20 May 2019 on certain aspects concerning contracts for the supply of digital content and digital services, OJ [2019] L 136/1.

<sup>88</sup> In particular, in EECC, Article 101.

<sup>89</sup> The Economic Regulation paper argues that this is particularly so for business users.



competition (competition on the basis of sustainability is also worth considering seriously, as we discuss later). The aim here is to move away from a common set of minimum performance standards which all networks must adhere to – which is also arguably a feature of the Open Internet Regulation – and instead encourage greater differentiation and competition in network and service quality. This might also have beneficial effects on the financial returns of operators who have hitherto found themselves forced to compete primarily on the basis of price.

Even with relatively high switching rates in telecommunications markets, **some vulnerable consumers remain and may be exploited**. Indeed, pressure to price discriminate may intensify with competition and the ability to do so increase with AI and other tools. The End-users Regulation paper suggests that we consider requiring operators to provide more prompts to consumers who have not switched after the expiry of their contract and, at a certain point, migrate them onto the best available tariff for their profile. An alternative would be to impose limits on degrees of price discrimination.

Sector specific regulation will need to be retained and further developed to address switching costs. In fixed telecommunications, the development of network-based FTTH competition has meant that the focus has shifted to accessing existing wiring inside buildings or the installation of new internal wiring from a point outside (now partly addressed in the GIA and EECC). This will potentially raise switching costs (relative to those involved when switching between resellers of the same network connection) and may reduce the willingness of users of FTTH connections to later switch provider again. In mobile communications, new challenges arise with SIMs in Internet of Things devices and difficulties in subsequently switching to an alternative connectivity provider. Electronic SIMs or eSIMs which allow over the air provisioning may help to address this, but the Social Regulation paper suggests that efforts to promote them have had limited impact to date.

## 4.2 Open Internet Regulation

We think it would be very unfortunate if the Open Internet Regulation were to inhibit the ability of network operators to exploit the capabilities of new technologies, such as the ‘network slicing’ capabilities of 5G Standalone networks. It may be that the ‘specialised services’ carve out in the existing Regulation can be interpreted and applied by national regulators in a way which will achieve this<sup>90</sup>. It would be **paradoxical for the Commission or national regulators to set targets for investments in new access technologies which the Open Internet Regulation then restricted the use of**. In our view, this should include the possibility of providers of internet access services being able to charge on a commercial basis upstream content or internet service providers for differentiated connectivity services that improve the experience for the user.

If the existing Regulation, as interpreted by the European Courts, does not allow firms to explore such arrangements (which we expect would be to the financial benefit of all parties who consented to participate in them) then we think the EU legislature ought to consider amending it so that they can.<sup>91</sup>

---

<sup>90</sup> See, for example, Ofcom’s *Net Neutrality Review Statement* 26 October 2023. It is too early to assess the impact of Ofcom’s attempts to clarify the application of the existing Regulation (which remained unchanged in the UK post-Brexit).

<sup>91</sup> The Commission and regulators initially envisaged that ‘zero rating’ practices could be beneficial and should be allowed in Europe under certain conditions. However, in September 2021 the ECJ (in Case C-854/19, *Vodafone v. Germany*, EU:C:2021:675) found them incompatible with the Regulation, forcing BEREC to amend its guidelines. Innovative services will not develop in Europe under such legal uncertainty.



Otherwise, as the End-users Regulation paper notes, the local access network in Europe will continue to be regulated as an undifferentiated utility whilst every other component of the distribution process (including devices downstream and CDNs and other networks upstream) can be optimised to improve the customer experience and match the requirements of the service. In addition, we think greater network optimisation could contribute to sustainability objectives.

### 4.3 Universal Service

The End-users Regulation paper notes that existing ‘universal service’ measures<sup>92</sup> were intended to ensure that firms in liberalised markets would continue to serve uneconomic (geographically or socially) customers in return for receiving a certain level of funding, generally obtained from levies on other firms inside the telecommunications industry. In practice, these levies have been quite limited in Europe and many operators have fulfilled their obligations without requesting or receiving any form of external subsidy (which may also have contributed to some extent to the poor financial health of those operators).

Since these measures were first adopted in 2002, the Commission has supplemented them with ‘universal availability’ targets for the widespread availability of new fibre and 5G services, including to uneconomic areas for which public funds can be provided under State Aid subsidy arrangements.<sup>93</sup> In addition, recent amendments to the Broadband State Aid Guidelines contemplate the provision of vouchers to households and businesses who may otherwise be reluctant to take up new services.

These subsidy arrangements have therefore come to contribute to a growing number of different objectives and financing arrangements. Universal service expectations remain limited in terms of the services that are to be subsidised and, generally, the level of subsidy required to achieve them is modest because they aim to allow a subset of citizens to access services that are already widely consumed by the rest of the population. In contrast, the Commission’s Gigabit Society and Digital Decade targets aim to move a large proportion of the population from their current services to new services which provide a step change in performance and to do so more quickly than the market might otherwise provide for. Achieving these objectives requires materially higher levels of subsidy than can be sustained by the universal service policy.

To date, universal service has been delivered inter alia by means of geographic averaging of tariffs across a single network (of the designated provider) on a national basis. However, we discussed earlier how the competitive landscape is changing in fixed telecommunications, with FTTH networks often being deployed in local areas by new entrants, some of whom are also recipients of public subsidies. It is not clear whether or how the concept of nationally averaged pricing would apply in these circumstances, or how the objectives of universal provision are to be achieved in a much more fragmented competitive landscape.

This leads us to the general conclusion that it is now time for the Commission to undertake a wholesale review of the role of subsidies in telecommunications. **If the Commission’s objective is the widespread or near universal and rapid utilisation by users of the new fibre and 5G networks that are being deployed, then it seems clear that significant public funding will be required to achieve it.**

---

<sup>92</sup> EECC, Articles 84-92.

<sup>93</sup> Commission Guidelines of 12 December 2022 on State aid for broadband networks, O.J. [2023] C 36/1.



Subsidies may also need to become more varied and based on affordability criteria, in the same way that most existing universal service tariffs are restricted to groups fulfilling certain criteria. ‘Affordability’ in this context may also need to vary by geographic location and to take account of differences in prevailing tariffs. Furthermore, subsidies may need to extend not only to support users to connect to new networks but also to compensate firms for retiring old assets and technologies earlier than they would otherwise choose to do so. Additional public funds may also be required to assist network operators in meeting security and resilience objectives. In this scenario, traditional universal service costs and objectives will be subsumed within a much more expansive set of subsidy arrangements that are intended to achieve the Commission’s various policy objectives.

## 4.4 A new strategic approach to the use of public funds in telecommunications

These new subsidy arrangements would require the EU legislator to **establish a new public funding model to support the pursuit of a range of policy objectives in telecommunications that cannot and will not be fully realised by the competitive market.** The objectives to which public subsidies would be applied would include, inter alia:

- accelerating the widespread deployment of new technologies (e.g. FTTH and 5G),
- accelerating the widespread adoption of those technologies (and associated services) amongst the general population or specific groups (e.g. SMEs) within it,
- enabling otherwise excluded groups to access those technologies,
- accelerating the retirement of old technologies (i.e. copper),
- supporting the extraction of insecure technologies already deployed in networks,
- supporting the adoption of higher cost technologies by firms (or consumers) in order to achieve longer term sustainability objectives.

Public subsidy should ensure that the pursuit of these objectives can be undertaken without distorting or undermining the competitive process itself and that there is transparency in dealings between private firms and public authorities.<sup>94</sup> It would also require policy makers to be clearer about the trade-offs and budget constraints that will inevitably be involved when allocating public funds to different purposes, to be disciplined when setting targets and to ensure a better link between setting targets and making sure that proper mechanisms are in place to deliver them.

In making this proposal, we take no position on what the overall size of the public budget for the telecommunications industry might be, which is a matter for policy makers to determine in light of other demands and priorities. We also take no position on how that budget is funded, other than that it should not result in further unbudgeted costs being imposed upon the telecommunications industry.

---

<sup>94</sup> Which are also the principles underlying the current universal service arrangements, see EECC, Art.90(2).



## 5. Resilience and Security

The key question addressed in our Resilience and Security paper is the extent to which we can rely upon competition between providers of telecommunications services and operators of telecommunications networks to ensure that services are secure, and networks are resilient, or when and whether the promotion of competition may actually undermine incentives or ability to invest in security and resilience. The paper finds that **telecommunications firms have invested in security and resilience and concludes that the current position is not critical. However certain trends are worrying** such as the rise of hybrid attacks and the growing threat of physical attacks to cables, both on land and subsea.

At the same time, Europe faces unprecedented threats arising from changes in the wider geopolitical environment, including the possibility of war, and there is a corresponding need to step up defensive preparedness. This is at a time when technological changes in the telecommunications industry, including network virtualisation, the proliferation of IoT devices and the use of AI by both attackers and defenders, introduce new challenges in terms of security and resilience and form part of a much more complex telecom ecosystem. We are not fully confident that existing preparations and contingency planning are commensurate to the threats being faced. This may reflect the fact that it is unclear the extent to which network operators and service providers can fully recover investments they make in resilience and security from end-users who may not fully value them because they do not fully appreciate the nature or consequences of the threats that are being faced in Europe today.

Regulations and recommendations to address security concerns have proliferated in recent years including the revised Network Information Security Directive,<sup>95</sup> the Critical Entities Resilience Directive,<sup>96</sup> the Cyber Resilience Act<sup>97</sup> and the 5G Security Recommendation.<sup>98</sup> The cumulative effect of these measures is difficult to assess at this point. It is clear that the 5G Recommendation imposed significant costs on network operators and delays in network deployment in some Member States where they were required by the Member State to swap out Chinese 4G and 5G network equipment but that these costs were avoided in Member States which took a different approach<sup>99</sup>. This divergence arises in part from limits on the European Commission's ability to regulate in relation to matters of national security (which remains a national competence) and consequent reliance upon 'soft law' instruments.

**The complexity and variety of existing European security policy in telecommunications suggests to us that there is an urgent need to ensure greater alignment between the different policies and objectives, a need for a greater technical and evidence-based consensus on the steps that are**

---

<sup>95</sup> Directive 2022/2555 of the European Parliament and of the Council of 14 December 2022 on measures for a high common level of cybersecurity across the Union, amending Regulation 910/2014 and Directive 2018/1972, and repealing Directive 2016/1148 (NIS 2 Directive), OJ [2022] L 333/80.

<sup>96</sup> Directive 2022/2557 of the European Parliament and of the Council of 14 December 2022 on the resilience of critical entities and repealing Council Directive 2008/114, OJ [2022] L 333/164.

<sup>97</sup> European Parliament legislative resolution of 12 March 2024 on the proposal for a regulation of the European Parliament and of the Council on horizontal cybersecurity requirements for products with digital elements and amending Regulation 2019/1020 (COM(2022)0454 – 2022/0272(COD)).

<sup>98</sup> Commission Recommendation 2019/534 of 26 March 2019 Cybersecurity of 5G networks, OJ [2019] L 88/42.

<sup>99</sup> Court of Auditors Special Report 03/2022 5G Rollout in the EU: delays in the deployment of networks with security issues unresolved.



**required to address security concerns and a need to properly consider and plan for the economic consequences for firms and the quality of the telecommunications networks of implementing policies before they are adopted.** The EU should not impose substantial unbudgeted costs on the telecommunications industry (or, for that matter, on other critical industries) in the pursuit of security or strategic autonomy objectives. This is relevant both in the long run and also now that actions are being considered to improve the security of sub-sea cable systems upon which European telecommunications networks depend.<sup>100</sup>

Our Resilience and Security paper considers the wider geopolitical and economic challenges in more detail than we can here. **Geopolitical security considerations should not result in policies that compromise the effective functioning of markets.** As the paper shows, Europe ought to continue to support open standards, interoperability and international collaboration despite pressures to the contrary. At the same time, we should be clear when trade-offs between competition and security objectives arise – earlier we suggested that both security and sustainability objectives will need to feature in the overall assessment of mergers, for example. Consolidation of networks (including to achieve pan-European scale) has ambiguous and, to date, poorly understood implications for security and resilience: it may realise efficiencies which support greater investment but may also concentrate risk and reduce diversity.

---

<sup>100</sup> Commission Recommendation 2024/779 of 26 February 2024 on Secure and Resilient Submarine Cable Infrastructures, OJ [2024] L 2024/779.



## 6. Sustainability and Carbon Targets

We think one of the challenges in relation to the sustainability and energy consumption of telecommunications services is that it remains largely invisible to users and so does not influence enough user behaviour or play any part in the competitive process between suppliers.<sup>101</sup> A rethinking of sustainability policy with more data, and measures on demand side and supply side, might seek to change that.

A policy rethinking could also **involve efforts to slow or delay the diffusion of new devices**, for example by prohibiting the marketing of subsidised devices. The Sustainability paper also shows that the greatest contribution to carbon emissions (and to the consumption of rare elements) in telecommunications is associated with devices, and particularly televisions and computers, that fall outside of the scope of telecommunications regulation. On the other hand, smartphones and other mobile devices (which account for 11-13% of emissions) are often sold by telecommunications service providers as part of a bundle and form a focal point for competition. In recent years the replacement cycle for such devices has lengthened as incremental benefits of new smartphones have become less significant for users and operators have responded by offering 'SIM only' tariffs. Widespread adoption of new Assisted or Virtual Reality devices could, however, radically change that.

### External assessments

The Sustainability Paper highlights the **need for national regulatory authorities to have adequate powers to obtain information on carbon emissions and other sustainability related metrics**, which some regulators do not consider they have today. Even if firms are pursuing their own sustainability objectives without regulatory targets or outcomes being imposed upon them, it is important that their performance is properly assessed and recorded (rather than only being self-reported or self-assessed), including in ways which might allow benchmarking and comparison between firms in different national markets. This would not only allow consumers to make informed choices about the sustainability performance of different suppliers within a Member State but would also allow regulators to better understand how differences between national telecommunications markets affect their performance in relation to energy consumption and other sustainability objectives, allowing them to better 'scale up' best practice.

### Supply-side measures

The Sustainability Paper shows that European telecommunications operators have already pursued a wide range of sustainability initiatives, whether for economic or other corporate responsibility reasons. New entrants have often built their fibre networks by reusing the ducts and poles that are already in place rather than undertaking further civil engineering works. This has been facilitated by the existing regulatory framework and, in future, by the GIA. In future network virtualisation and new supply chain structures may enable a greater degree of sharing of resources, especially physical resources such as the Radio Access Network or RAN, although the precise form such arrangements might take is uncertain today.

---

<sup>101</sup> The important enabling aspects of digital infrastructure for other sectors in pursuing sustainability objectives are often not visible either.



Thus, **firms ought generally to have incentives to minimise their costs and, associated with this, their consumption of resources including energy** although operators, particularly in competitive conditions, may also make short term technology choices which involve lower financial costs in the short term, but which are sub-optimal from a long-term sustainability point of view. We said earlier that we do not generally favour regulation that mandates a particular technology (e.g. point to point fibre rather than point to multi-point), whether on sustainability or other grounds. However, the Sustainability Paper identifies two issues which we think European policy makers should consider further.

One is the extent to which the **EU could set expectations** (either unilaterally or in collaboration with Governments in other parts of the world) about the sustainability of future technologies through influence in the process for specifying technical standards (e.g. in relation to the energy consumption of 6G technology).

Closer to home, the Sustainability Paper makes the fundamental point that telecommunications regulation and policy has typically been focussed on the expansion of infrastructure and the universal, or at least very widespread, provision of services whenever users wish to use them. The targets which the Commission has adopted in recent years seek to expand the provision and consumption of services without any apparent consideration of the sustainability implications. A different approach to setting such targets would focus more on **how resources could be optimised in a way which minimises differences between different groups of consumers or households whilst maximising sustainability outcomes** - rather than seeking to achieve uniformity. For example, using public funds to commission the construction of FTTH networks in very rural areas fails to recognise the sharply rising marginal costs (in both financial and resource terms) of deploying fibre infrastructure as population density falls.

An alternative approach would involve requiring households in very rural areas to be served by other, comparatively more efficient but admittedly less performative, technologies such as fixed wireless access. This would challenge the expectation that all users have or should have an 'entitlement' to the same telecommunications connectivity and services but would instead seek to minimise differences in performance in the most sustainable manner possible. Even if the Commission does not adopt this approach, we think it ought to explicitly take account of the sustainability implications of any targets which it does decide to adopt in future.

We would expect that our proposals to ensure that the **Open Internet Regulation** does not inhibit measures to optimise the performance of network services should also contribute to existing network resources being managed and utilised more efficiently and, again, this could form part of the overall assessment when national regulators assess their conformity with the Regulation.

Similarly to our proposal that we adopt a **'use it or lose it' approach to spectrum** assignment which should force holders of spectrum licences to focus on effective utilisation of their assets (including in ways which may not always maximise financial returns but would nonetheless yield environmental benefits). If spectrum deployed in rural areas is poorly utilised then it should be open to the regulator to explore ways in which it might be otherwise utilised in a way that reduces emissions (for example, by switching certain sites off at night). Followed to its logical conclusion, this would imply a rethinking of what 'coverage' means in future.



Finally, the **retirement of old technologies** such as copper networks should contribute to sustainability objectives.

Regarding **competition law**, at present environmental considerations would not generally feature in any competition assessment of proposed network sharing arrangements, which would be assessed on narrower competition grounds. In future, we think environmental considerations could be taken into account, particularly if the decision on other economic grounds is found to be marginal (we have also said that security and resilience considerations ought to be part of the assessment). We earlier made a similar suggestion in relation to merger assessments.

## Demand-side measures

Attempts could also be made to **influence the consumption of new services which require a large energy budget** – the Sustainability paper gives the example of real time streaming services as compared to download and replay of the same content. AI-enabled services, in data centres, on edge networks or in devices themselves, are expected to be (very) energy intensive.<sup>102</sup>

One approach might involve thinking about how **end-users could be better informed** about their consumption choices and their environmental or energy implications, allowing them either to alter their behaviour or to make choices between competing applications and services.<sup>103</sup> The Sustainability paper notes that there is already recently adopted horizontal legislation that would improve the environmental labelling on devices and introduce common repair standards<sup>104</sup> but notes that the telecommunications contract regulations (also discussed in the Social Regulation paper) do not currently require that information is provided about the environmental impact of the telecommunications services or networks to which those devices connect. We think the EU legislature should consider how and whether prompts might be used to provide the user with real time information about the digital services they are using or are about to use so as to inform their behaviour and choices, although we accept that this could prove very challenging given the complex and fragmented supply chain for many services and the difficulties which consumers have with engaging effectively (or at all) with such measures.

<sup>102</sup> The virtualisation of networks, discussed earlier, may involve changes in where energy is consumed – more in data centres less in local networks – but the implications for total consumption are less clear to us.


<sup>103</sup> See the ongoing work of BEREC Working Group SUS on empowering end-users at <https://www.berec.europa.eu/en/document-categories/berec/reports/berec-report-on-ict-sustainability-for-end-users-empowering-end-users-through-environmental-transparency-on-digital-products#:~:text=BEREC%20Report%20on%20ICT%20sustainability,environmental%20transparency%20on%20digital%20products&text=BEREC%20considers%20end%20users%20awareness,empowerment%20and%20for%20ICT%20sustainability.>

<sup>104</sup> Regulation (EU) 2024/1781 of the European Parliament and of the Council of 13 June 2024 establishing a framework for the setting of eco-design requirements for sustainable products.

cerre Centre on Regulation in Europe



Avenue Louise 475 (box 10)  
1050 Brussels, Belgium  
+32 2 230 83 60  
info@cerre.eu  
www.cerre.eu

 Centre on Regulation in Europe (CERRE)  
 CERRE Think Tank

