BEREC
Body of European Regulators for Electronic Communications

BoR (23) 109

# BEREC Annual Report for 2022

8 June 2023

# Contents

# Foreword by the BEREC Chair 2022

Providing meaningful connectivity, serving societal needs, BEREC's has never been as relevant as it was in 2022. With the Russian aggression in Ukraine, we witnessed a large stream of refugees who, once in safety, wanted to reach out to loved ones back home. We also saw testimony of the incredible courage and resilience of Ukrainian men and women to restore destroyed infrastructure and keep the lines open. All across Europe, the connectivity sector came into action. BEREC facilitated voluntary agreements by the telecom industry to keep Ukrainians abroad connected by monitoring and analysing the roaming patterns. We cooperated to enable the EU-wide ban on propaganda channels by reducing regulatory uncertainty on the open internet rules. And individual NRAs helped with spectrum issues in bordering regions and through supplying equipment to help restore the connectivity infrastructure. In this context, welcoming our colleagues from the Ukrainian National Regulatory Authority (NCEC) as participants without voting rights to the BEREC family helped strengthen our ties on the European continent.

These additional activities came on top of a very ambitious work programme for 2022, which BEREC delivered in full. Working on our three strategic goals, promoting full connectivity, sustainable open digital markets and empowering end users, we issued 7 BEREC Opinions, 39 BEREC Reports, 3 strategic documents, 9 regulatory best practice-oriented documents and 31 other documents on various BEREC work-related matters[1]. These products provide insights (data, analysis, conclusions and advice) that help regulators and also co-legislators and other stakeholders to work together towards the ambitious targets set in Europe for 2030.

Meaningful connectivity is much broader than just being connected: the openness of the internet ecosystem is an integral part. Our study on the internet ecosystem lays the groundwork for further BEREC work and contributions. With Europe setting new rules to achieve open digital markets, BEREC continued to provide opinions, support and technical expertise to help co-legislators in designing effective new rules to govern the digital economy. After the legislative process of the DMA was concluded, our contribution in 2022 focused on interoperability and data portability in the context of the DMA, DSA and Data Act. Through this accumulation of work, BEREC and its members are ready to continue to contribute at European level (for example in the High Level Group of the DMA) as well as support NRAs in consistently implementing the emerging European digital regulatory framework at national level, insofar as this is part of their role.

We also worked on the digital divide, sharing experiences on bridging this divide, because connectivity is only meaningful if it is available, affordable and accessible. And, alongside the digital transition, the green transition formed a key focal point in 2022. We continued our efforts, not only to reduce our own carbon footprint, but also to deepen our conversations with stakeholders about meaningful indicators that will help the ICT sector measure its contribution and progress.

[1] A full overview can be found in Annex 8.

Both the digital and the green transition further underlined the need for regulators to work together, internationally as well as across different remits. In that spirit, we had fruitful meetings with ENISA, the RSPG, ERGA, FCC and CRTC.

Chairing BEREC is a significant task, a task that could not have been completed without many colleagues bringing their enthusiasm to its fulfilment. And specifically not without the experienced drafters of the Working Groups, the commitment of the Co-Chairs, the generous support of the BEREC Office, the constructive criticism of CN members and the steering of members of the Board of Regulators. A special thanks goes to the Vice-Chairs of the Board, always ready to share strategic advice.

Chairing BEREC is also a task that has to be passed on. I am happy to do so, with full support and in full confidence, to Professor Konstantinos Masselos, head of the EETT, and his team.

**Annemarie Sipkes**

**BEREC Chair 2022**

# PART A: Annual Report on market developments in the electronic communications sector in 2022 – in accordance with Article 4(1)(j)(v) of the BEREC Regulation 2018/1971

Annual Report on market developments in the electronic communications sector in 2022, in accordance with Article 4(1)(j)(v) of Regulation (EU) No 2018/1971 of the European Parliament and of the Council of 11 December 2018 establishing the Body of European Regulators for Electronic Communications (BEREC) and the Agency for Support for BEREC (BEREC Office).

## Executive summary

The Body of European Regulators for Electronic Communications (BEREC) Annual Report for 2022 highlights the key developments and market trends in the electronic communications sector in Europe over the past 12 months, focusing on market dynamics and the development of European Union public policies and regulatory practices. The report presents the perspectives of BEREC, based on the expertise and knowledge of the member national regulatory authorities (NRAs).

In addition, the report describes BEREC's own contribution to the development of the electronic communications sector in Europe. The analysis presented in this report includes qualitative reasoning based on information from the activities of BEREC Working Groups (WGs) and quantitative data based on periodic BEREC data collection exercises and other public documents.

Following the provisions of the European Electronic Communications Code (EECC), in 2022, BEREC worked intensively on the transposition process through the approval and publication of a considerable number of regulatory best practice-related documents and implementation reports, aiming for the transparent, harmonised and effective application of the Code to ensure consistent and predictable application of the rules throughout the European digital single market.

All the important aspects of BEREC's work in 2022 are highlighted in Part A of this report, while Part B summarises the key deliverables that were set out in BEREC's Work Programme 2022 when it was published in late 2021. Taking into account the challenging political and economic context, the BEREC Chair 2022, Ms Annemarie Sipkes (ACM, the Netherlands), noted a successful implementation of this very ambitious work programme, focused on BEREC's three strategic goals: promoting full connectivity, supporting sustainable open digital markets and empowering end-users.

The key deliverables highlight BEREC's commitment aiming at fostering the independent, consistent and high-quality regulation of digital markets for the benefit of Europe and its citizens (BEREC strategy 2021-2025[2]). At the same time, they show BEREC's continuous engagement and cooperation with its stakeholders and international organisations, as well as BEREC's underlying analytical and monitoring work that helps BEREC to react and provide input and opinions based on a robust data-gathering exercise.

# 1. Introduction

This section of the Annual Report highlights important market trends and developments in the European electronic communications sector in 2022, focusing on market dynamics and the development of European Union public policies and regulatory practices under Article 4(1)(j)(v) of the BEREC Regulation. The market trends are presented from the perspective of BEREC and, where relevant, related to BEREC output based on the expertise and knowledge of the member national regulatory authorities (NRAs). The analysis presented in this chapter includes qualitative reasoning based on information from the activity of the BEREC Working Groups (WGs) and quantitative data based on periodic BEREC data-collection exercises and other public documents. Particular attention is paid to Broadband and Very High Capacity Networks, Mobile Broadband, Regulatory Accounting and 5G.

In this context, the Chair's Study 2022 should also be mentioned. This Study, which will be finalised in April 2023, aims to assess the nature, evolution and market conditions of new business models that are enabled by new 5G capabilities and technologies.

[2] BoR (20) 108, see: https://www.berec.europa.eu/en/document-categories/berec/berec-strategies-and-work-programmes/berec-strategy-2021-2025

## 1.1. Chair's Study for 2022

A request for proposals for the Chair's Study for 2022 on wholesale mobile access connectivity, trends and issues for emerging mobile technologies and deployments was published in May 2022. BEREC received 7 offers in July 2022. In August, Wik GmbH won the selection procedure. The project started in September 2022.

The Chair's Study aims to assess the nature, evolution and market conditions of new business models that are enabled by new 5G capabilities and technologies (such as Enhanced Mobile Broadband, Massive Machine Type Communication, Ultra reliable and low latency communications). The goal is to identify relevant issues associated with wholesale connectivity for MVNOs and verticals, and observations and identification of possible interactions or dependencies between trends.

The conclusions will include the prediction of the future trends in the next three to five years, and indicate potential challenges and opportunities in the roles and capabilities of NRAs regarding this topic.

The study is performed using interviews, surveys and information derived from desk research to support EU-level overview with focus on France, Germany, Austria, the Czech Republic, Norway, Ireland, and with use cases including automotive, smart city, industrial and energy. In this context, surveys were sent to NRAs, MNOs, MVNOs and verticals ((including representatives of manufacturing, automotive and 'smart city'). Interviews were also conducted with MNOs, MVNOs, verticals, the NRAs of focus countries and an equipment manufacturer.

5G use cases are generally still at a 'proof of concept' phase except for some private networks. The first observations indicate differences between market approach and options for MNOs, MVNOs and verticals and differences between countries with regard to markets for MVNOs and verticals.

The data collection phase of the Study was finalised in January 2023 and followed by the analysis phase and finalisation of the report. In early 2023, preliminary results will be presented in the Contact Network meeting. In March 2023, a presentation will be given to the BoR during the first Plenary. The draft final report will then also be ready for final check and approval.

# 2. Market trends

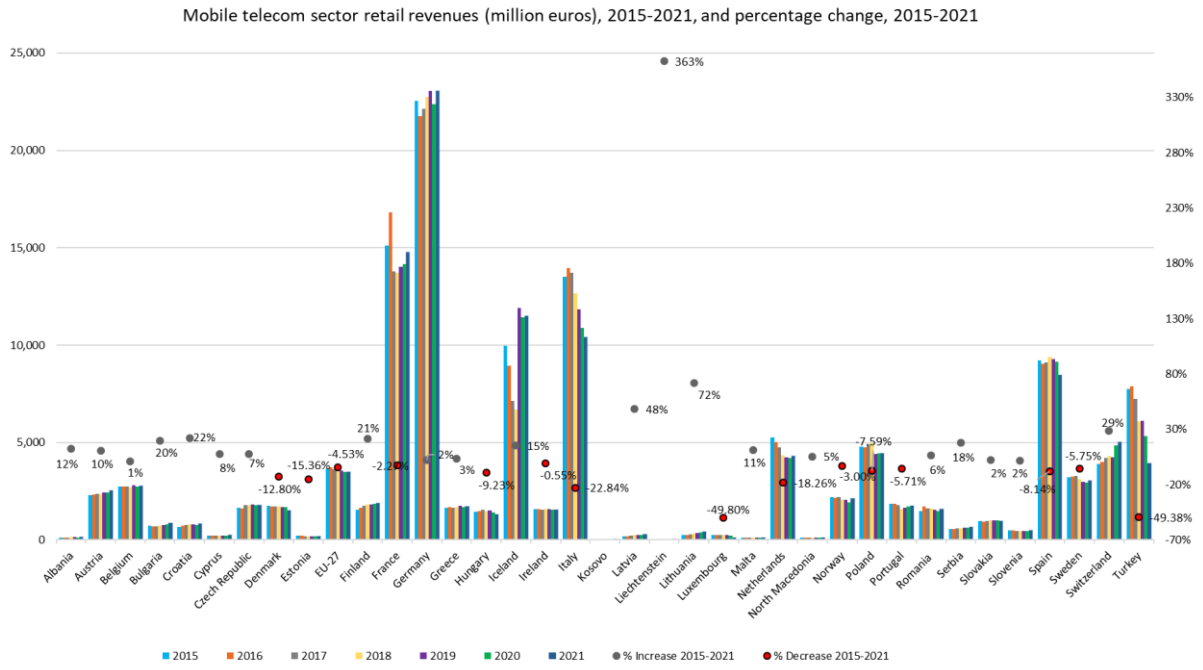
## 2.1. Economic context: electronic communications sector retail revenue

An analysis is based on the period from 2015 to 2021. For this period, the average retail revenue for the EU-27 grew by 4.08%.

Figures 1 and 2 below present mobile and fixed retail revenue, respectively, between 2015 and 2021 for 36 European countries and the EU-27 average. Figure 1 shows that retail

revenue in the mobile communications sector grew for 21 countries but declined for 14[3]. According to NRA data, mobile retail revenue increased substantially in Bulgaria (19.58%), Croatia (21.78%), Finland (21.18%), Latvia (48.44%), Liechtenstein (362.53%), Lithuania (71.62%) and Switzerland (28.78%), while in Denmark, Estonia, Italy, Luxembourg, Netherlands and Turkey it fell by more than 10% in the same period.

*Figure 1: Mobile telecom sector retail revenue (in EUR million) and percentage change 2015-2021*

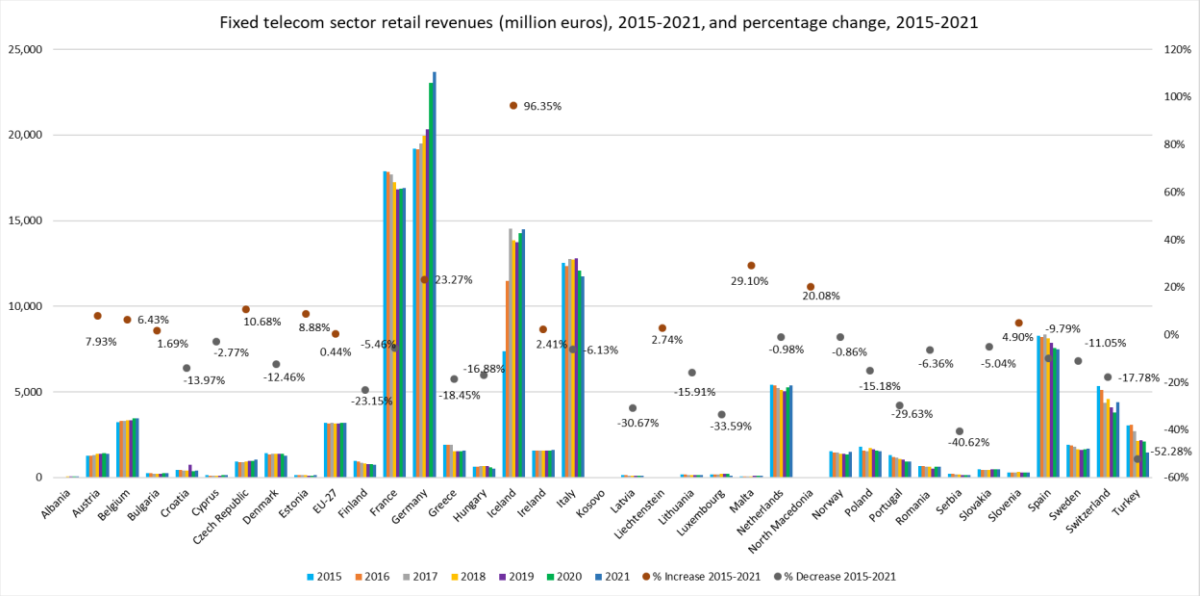



*Source: according to the data provided by NRAs*

Figure 2 shows that, between 2015 and 2021, retail revenue in the fixed communications sector grew for 12 of the 36 countries analysed. However, for 22 countries this revenue fell, and in 14 of these the variation was above 10%. The largest increases in fixed retail revenue were in Germany (by 23.27%), Iceland (by 96.35%), Malta (by 29.10%) and North Macedonia (by 20.08%). The largest decreases were in Finland (by 23.15%), Latvia (by 30.67%), Luxembourg (by 33.59%), Portugal (by 29.63%), Serbia (by 40.62%) and Turkey (by 52.28%).

[3] *Kosovo data covers only the period 2019-2021, therefore the change for the period 2015-2021 is not calculated.*

*Figure 2: Fixed telecom sector retail revenue (in EUR million) and percentage change 2015-2021*




*Source: according to the data provided by NRAs*

## 2.2. Broadband and Very High Capacity Networks

Article 3(2)(a) of the EECC[4] stipulates that the national regulatory and other competent authorities as well as BEREC, the Commission and the Member States shall, inter alia, pursue the new general objective of promoting connectivity and access to, and take-up of, very high capacity networks, including fixed, mobile and wireless networks, by all citizens and businesses of the EU. This objective is also at the core of the EU's ambition towards a Gigabit Society and, therefore, the concept of a very high capacity network is also used in other initiatives taken up by the EU institutions.

Connectivity and the use of electronic communications are an integral element of European society and welfare. Very high capacity networks support innovation in content-rich internet services, strengthen the international competitiveness of the EU and have enormous potential to deliver benefits to consumers and businesses across the EU.

EECC Article 2(2) defines the term 'very high capacity network' and Article 82 provides that BEREC shall issue guidelines on the criteria that a network has to fulfil in order to be considered a very high capacity network, in particular in terms of down- and uplink bandwidth, resilience, error-related parameters, latency and its variation. In October 2020, BEREC published these Guidelines[5] and determined (paragraphs 18 and 21), in accordance with the

[4] European Electronic Communications Code.
[5] BoR (20) 165, see:
https://berec.europa.eu/eng/document_register/subject_matter/berec/regulatory_best_practices/guidelines/9439-berec-guidelines-on-very-high-capacity-networks

EECC, that any network that fulfils one (or both) of the two criteria below is a fixed very high capacity network[6].

(i) Any network providing a fixed-line connection with a fibre roll-out at least up to the multi-dwelling building.
(ii) Any network providing a fixed-line connection that is capable of delivering, under usual peak-time conditions, services to the end-users with the following quality of service:

| Quality of Service Parameter | Threshold |
|---|---|
| Downlink data rate | ≥ 1000 Mbps |
| Uplink data rate | ≥ 200 Mbps |
| IP packet error ratio | ≤ 0.05% |
| IP packet loss ratio | ≤ 0.0025% |
| Round-trip IP packet delay | ≤ 10 ms |
| IP packet delay variation | ≤ 2 ms |
| IP service availability | ≥ 99.9% per year |

From this, it follows (see paragraph 63 of the Guidelines) that fixed networks based on fibre to the building (FTTB) or fibre to the home (FTTH) qualify as a very high capacity network. Fixed networks with a fibre roll-out that is not at least up to the multi-dwelling building may also qualify as a very high capacity network. However, they have to meet the Quality of Service (QoS) thresholds listed above, which depend not only on the access technology deployed in the fixed network, but also on, for example, the access network architecture (i.e. the extent to which fibre is rolled out, e.g. FTTN/C/dp[7]), the length and quality of the copper loop, and the number of subscribers who share the same coax access network (see BoR (20) 226, question 27, p. 19-20)[8].

Therefore, in general, fixed networks with G.fast 212 MHz access technology on copper access lines, with copper loop lengths comparable to copper loops in a multi-dwelling building, may qualify as a very high capacity network, as the QoS thresholds of the BEREC Guidelines have been determined based on such a scenario (see BoR (20) 165, Annex 3), but not all fixed networks based on VDSL2 vectoring qualify as a very high capacity network. In general, fixed networks based on DOCSIS 3.1 with a coax-based access network of comparable size to a coax access network within a multi-dwelling building may also qualify as a very high capacity network, as the determination of the QoS thresholds in the BEREC Guidelines also

[6] In addition, these BEREC guidelines (paragraphs 18 and 21) also determined the criteria a network has to fulfil in order to qualify as a wireless very high capacity network.
[7] FTTN, FTTC and FTTdp stand for 'Fibre to the node', 'Fibre to the cabinet' and 'Fibre to the distribution point'.
[8] See https://berec.europa.eu/eng/document_register/subject_matter/berec/others/9724-berec-response-on-the-targeted-public-consultation-on-the-evaluation-of-the-state-aid-rules-for-the-deployment-of-broadband-networks

examined this scenario. However, not all fixed networks based on DOCSIS 3.1 qualify as a very high capacity network.

EECC Article 22 provides that national regulatory and/or other competent authorities shall conduct a geographical survey of the reach of electronic communications networks capable of delivering broadband by 21 December 2023. This geographical survey may also include a forecast of the reach of broadband networks, including very high capacity networks.

EECC Article 22(7) also states that BEREC shall issue guidelines to assist national regulatory and/or other competent authorities on the consistent implementation of these obligations, which BEREC published in March 2020[9], March 2021[10] and June 2021[11], and use the term 'very high capacity network' in line with EECC Article 2(2) and the BEREC Guidelines on very high capacity networks[12]. Therefore, in the future, the deployment of very high capacity networks may be tracked based on these data.

According to the study 'Broadband coverage in Europe 2021'[13] and its predecessor studies commissioned by the European Commission, FTTP (defined as FTTB and FTTH) coverage in the EU[14] increased significantly between 2013 and 2021, from 16% to 50% of households (see Figure 3 below).

The coverage of fixed very high capacity networks is at least as high as FTTP coverage, as networks based on FTTP qualify as a fixed very high capacity network, as do fixed networks without a fibre roll-out at least up to the multi-dwelling building, but which meet the QoS thresholds (see Figure 3 below).

In eight countries (Latvia, Spain, Portugal, Romania, Bulgaria, Sweden, Lithuania, Luxembourg), the FTTP coverage, and therefore also fixed very high capacity network coverage, is already higher than 75%, while in three countries (Germany, Belgium, Greece) the FTTP coverage is still below 20% (see Figure 4 below).

[9] BoR (20) 42, see: https://berec.europa.eu/eng/document_register/subject_matter/berec/regulatory_best_practices/guidelines/9027-berec-guidelines-to-assist-nras-on-the-consistent-application-of-geographical-surveys-of-network-deployments

[10] BoR (21) 32, see: https://berec.europa.eu/eng/document_register/subject_matter/berec/regulatory_best_practices/guidelines/9884-berec-guidelines-on-geographical-surveys-of-network-deployments-article-22-2-22-3-and-22-4

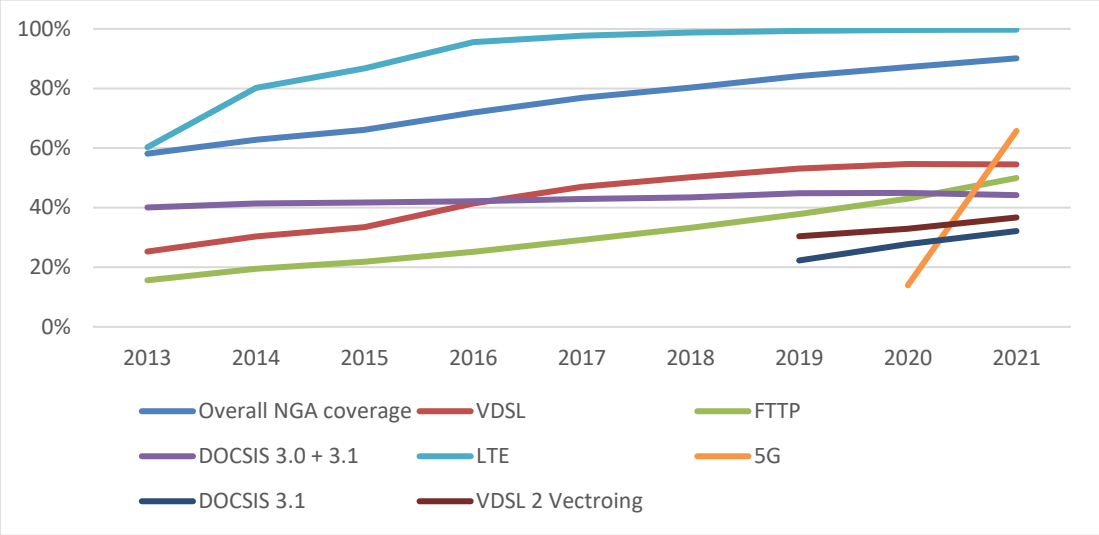
[11] BoR (21) 82, see: https://berec.europa.eu/eng/document_register/subject_matter/berec/regulatory_best_practices/guidelines/9980-berec-guidelines-on-geographical-surveys-of-network-deployments-verification-of-information

[12] BoR (20) 165, see: https://berec.europa.eu/eng/document_register/subject_matter/berec/regulatory_best_practices/guidelines/9439-berec-guidelines-on-very-high-capacity-networks

[13] Broadband coverage in Europe 2021, see: https://digital-strategy.ec.europa.eu/en/library/broadband-coverage-europe-2021

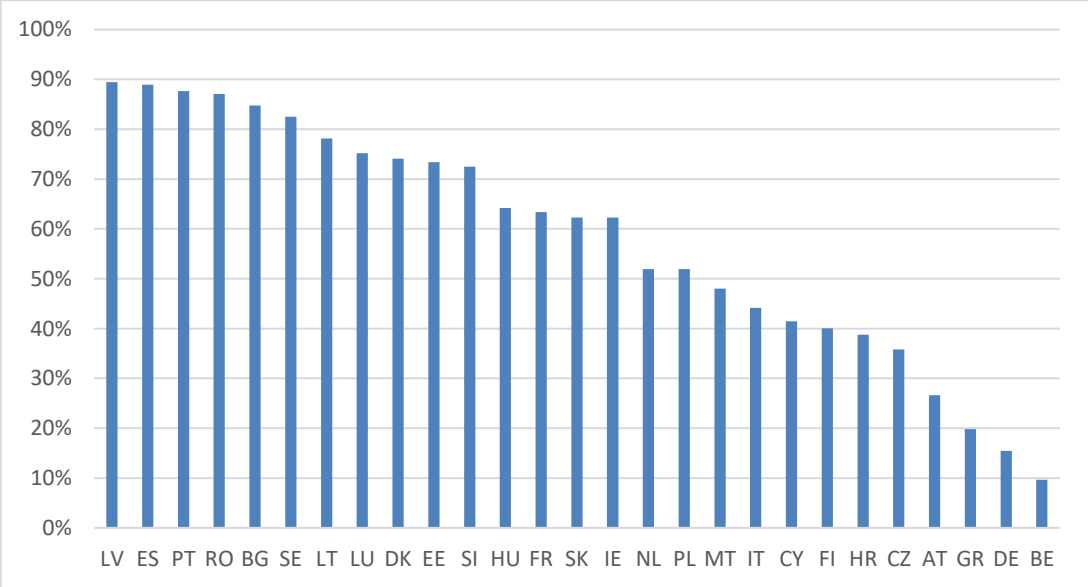
[14] EU-27.

*Figure 3: Development of LTE and NGA coverage in the EU by technology, 2013-2021*




*Source: Broadband coverage in Europe 2021*[13]

*Figure 4: FTTP coverage by country in 2021*




Source: Broadband coverage in Europe 2021[13]

The coverage of other types of broadband networks developed in the EU[14] between 2013 and 2021 is as follows: total Next-Generation Access (NGA) coverage in the EU increased significantly from 58% to 90% of households (see Figure 4 above). This increase mainly came from growth in VDSL and FTTP coverage, while cable (DOCSIS 3.0 and DOCSIS 3.1) coverage was fairly constant during this period. NGA coverage increased fairly steadily on average by 4.0% points per year and the FTTP coverage also increased fairly steadily between 2013 and 2020 on average by 3.9% points per year. However, in 2021 the yearly

increase rose to 7% points. VDSL coverage growth peaked in 2016 at 8.0% points per year and has since declined to 0% points per year in 2021. The coverage of the more advanced VDSL and DOCSIS technologies, VDSL2 vectoring and DOCSIS 3.1., increased between 2019 and 2021 from 30% to 37% (VDSL2 vectoring) and 22% to 32% (DOCSIS 3.1).

Looking at mobile networks, long-term evolution (LTE) was rolled out between 2013 and 2021 from 60% coverage to 99.8%, and the 5G roll out began around 2020 and increased rapidly from 14% in 2020 to 66% in 2021.

## 2.3. Mobile broadband

Various generations of mobile technologies have primarily focused on human communication, including voice, data, and the internet (or mobile broadband).

Mobile broadband is widely used in Europe, mainly as a complement to fixed broadband. In terms of national penetration as a percentage of individuals, according to the EC's Digital Economy and Society Index 2022[15], 10 countries (Austria, Belgium, Cyprus, Denmark, Spain, Finland, Ireland, Luxembourg, Netherlands, and Sweden) achieve 90% or greater (>90%) national penetration of mobile broadband. 14 countries achieve penetration between 80 and 90% (% of individuals).

Similarly, in terms of national penetration of mobile-only internet access as a percentage households, five countries (Bulgaria, Finland, Poland, Latvia and Romania) enable more than 10% of households to connect to the internet by this means only. Finland has the highest mobile-only internet access (34% of households).

Most mobile broadband subscriptions are used on smartphones rather than on tablets or other devices. It is also reported that approximately 200 5G smartphones were launched during 2022 and more than 1500 5G devices are available, many beyond smartphones[16]. The impact of 5G on mobile broadband is a topic of interest to BEREC and it will continue to consider it.

## 2.4. Regulatory accounting

The overall picture of the cost accounting methodologies is relatively stable in comparison to last year with just a small number of changes by NRAs since last year. There are clear preferences for price control methods (cost orientation alone or in combination with price cap, but the overall picture is more differentiated), cost base (current cost accounting – CCA) and allocation methodologies (mainly long run incremental costs (LR(A)IC), with fully distributed costs (FDC) preferred only for a few products). The degree of consistent application of methodologies in accordance with the EU Regulatory Framework continues to be high and accommodates the use of elements or parameters that reflect national circumstances.

[15] The Digital Economy and Society Index (DESI) | Shaping Europe's digital future (europa.eu)
[16] The Global mobile Supplier Association (GAMbod) https://gsacom.com/technology/5g/ and Ericsson Mobile Report November 2022, see: Ericsson Mobility Report November 2022

The RA report 2022 provides an analysis more oriented to single products (increasing the scope of monitoring) with respect to the previous editions. Whereas the 2021 report collected information for 23 main products (13 in 2015), the 2022 report collects information on 17 main products, simplifying the information previously collected mainly due to a reduced set of products on copper network.

The regulation of legacy products in market 3a and 3b is more frequent: 85% of EU NRAs still maintain SMP remedies on ULL and 67% on market 3b over legacy copper network (reduced from 81% compared with last year's report). In the case of the former market 3a/2014, VULA product over FTTC and FTTH, the situation has remained unchanged since last year. In relation to market 3b/2014, the number of NRAs that no longer regulate NGA products increased since last year. The SMP regulatory remedies have been applied by NRAs generally towards a single SMP operator that is national in scope. In some cases the SMP regulation has been applied to more than one SMP operator.

The number of NRAs that face different competitive conditions across their national territory, thus justifying a geographically differentiated approach (in terms of market definition or remedies application), has increased with respect to last year for some markets/products. Looking at geographically differentiated regulation, it can be seen that deregulated areas range from 5% of households up to 70% in market 3b, very often between 20% and 50%, increasing in comparison with last year's report[17]. The percentage of households falling under a geographical regulation in combination with less regulatory obligations in markets 3a and 3b (Spain, Poland, Portugal, France) is in line with a regulatory path where a geographical regulation is applied to avoid non-proportional regulation. Also, the competitive areas are increasing.

Most NRAs apply the whole set of remedies when SMP regulation is imposed on a specific product/market, where access obligation in combination with non-discrimination are the most frequently applied remedies.

Within the copper network, ULL is still the most regulated product. Focusing on RA in general, accounting separation is often imposed together with the cost accounting obligation. Some NRAs consider it necessary to impose both obligations in order to ensure that robust regulatory accounting information is available for each product. This rationale is related to the fact that accounting separation is useful for vertically integrated undertakings by using cost models to supplement price control measures in order to prevent unfair cross-subsidies (e.g. if the result of the cost model is higher than the cost derived from the accounts of the SMP operator), and when the regulatory framework, in perspective, can become less intrusive.

As a stable result during the past few years, cost orientation remains the most commonly used price control method and it is applied mainly for legacy products, while the retail minus category refers mainly to VULA and market 3b products.

ERT price control methodology is still mainly used complementarily to cost orientation, albeit a slightly increased use of the ERT at least for NGA/VHCN wholesale products as a price control method can be observed, suggesting it is a substitute with respect to cost orientation,

[17] PT apply a differentiated market and remedies approach in ex market 4_2014; as this is a market targeted to companies (small, medium and large), the percentage of households covered (by regulated and/or deregulated areas) is not relevant.

in line with the Commission NDCM Recommendation (2013/466/EU) and the price flexibility tool according to the Code.

Cost orientation for FTTH is more frequent when a legacy network based on copper is still relevant for NGA products (FTTC), where a stronger relation of substitution with respect to a legacy copper product may occur. Where no intermediate steps like FTTC for VHCN transition are in force, generally more flexibility is granted when regulating FTTH, also with the application of ERT. More generally, the relevance of the legacy copper network for NGA take-up (e.g. the case of FTTC) appears to be correlated to the regulatory approach in terms of remedies imposed in access market as well as at the level of the price flexibility tool according to the Code, other than the application of non-discrimination rules such as EoI.

Overall, the application of EoI models is increasing over the years. The cumulative percentage of EoO and/or EoI is higher in relative terms in case of VULA (FTTH) as well as for market 3b.

With regard to the cost base CCA is by far the most commonly used methodology for all markets. The situation remains stable in comparison to last year.

The most frequent cost allocation approach is LRIC/LR(A)IC, for almost all products/markets. In the access market (market 3a) a preference for LRIC/LR(A)IC can be found. In general, when LR(A)IC/LRIC is chosen as the main category, the most common approach is 'bottom-up'. FDC is a frequent approach for Market 4 over legacy network. With respect to last year an increase in relative terms of the use of FDC can be detected also for Market 3b for legacy products and NGA products, due to the fact that NRAs that used LR(A)IC removed regulation (there is no 'transition' from LR(A)IC to FDC).

For copper LLU most NRAs apply a cost orientation alone/LRIC-LR(A)IC/CCA approach. Generally there is an increase in the use of the combination of cost orientation/price cap with BU-LRIC approach and a reduction of accounting methodologies based on FDC; TD approach is by far less frequent.

Analysis of the structural data confirms that countries start from very different points in terms of population, topography, market situation etc. These factors influence the regulation strategy of NRAs for the wholesale access markets.

Compared with the BEREC WACC parameters Report 2022 (BoR (22) 70), the present BEREC Regulatory Accounting Report WACC chapter is of a more descriptive nature, aiming at reporting and analysing NRAs WACC calculations 'as is' as well as showing the evolution over time, in line with previous versions.

Regarding the WACC, the in-depth survey and the update provided in this report highlights that all NRAs use the Capital-Asset-Pricing-Model (CAP-M)[18] and hence similar parameters for determining the WACC. However, the value of these parameters naturally differs reflecting different national financial market conditions. The statistical analysis (regression) of the data shows – in line with the previous exercises – that the differences of the final WACC values over time are mainly explained by parameters in the WACC calculation that are more 'country related' such as the RFR, ERP and Tax rate, with a less relevant role for 'sector-specific' parameters such as beta, gearing and debt premium. This is consistent with survey results on

[18] Cf. BoR (13) 110; Cf. BoR (13) 110; Cf. BoR (13) 110, see: https://berec.europa.eu/en/document-categories/berec/reports/berec-report-on-the-regulatory-accounting-in-practice-2013

'used methodologies' that confirm that beta, gearing and debt premium are estimated mainly on a 'notional' basis by NRAs from a long time prior to the WACC Notice.

By taking into account only the most recent estimation over time (last three most recent values for each NRA) in the pooled regression analysis, the results show that the ERP, that was the second most relevant parameter after RFR for explaining differences between WACC values applied by NRAs until recently, has become less relevant. Tax, which is a country parameter, not under NRAs' control, has become more relevant in explaining differences with respect to ERP since last year. This result confirms the fact that the ERP estimation through a notional approach by most NRAs due to the application of the Commission Notice is reducing its spread. At the same time, beta is becoming more relevant for explaining the difference in WACC values between NRAs due to asynchronous update of the parameter and due to the fact that, contrary to the past, the variation of this parameter is more relevant than before. This also shows that the application of the WACC Notice continues to have a material convergent effect.

Overall, the 2022 data confirm a consistent approach to regulatory accounting. The latter indicates that NRAs are providing predictable regulatory environments in their countries. The convergence of regulatory accounting approaches for wholesale access markets needs to bear in mind that wholesale access markets are reflecting different national market situations and structural factors influencing the regulatory strategy.

## 2.5. 5G

Traditionally, mobile technologies focused on human communication, including voice, data, and the internet. The 5G generation of mobile technology has the ability to also provide enhanced services to a range of industries. For example, 5G supports low latency, high speed, and massive machine type communications, and this means it is well suited to address new use cases whether in industry 4.0, agricultural automation, the automotive industry, transport or healthcare.

The EU policy goals for 5G are contained in the Digital Decade initiative and the 5G security toolbox, and include:

- 5G coverage of all populated areas by 2030
- Pan-European deployment of 5G corridors
- Multi-country 5G initiatives
- Leveraging EU recovery funds for 5G projects
- Improving the security of 5G networks
- Limiting any dependence on a single 5G vendor
- Stimulating the EU's capabilities as a 5G equipment manufacturer

This Digital Decade framework includes the Digital Decade Policy Programme with targets, objectives, multi-country projects, and the Digital Decade rights & principles[19]. The major target by 2025 includes: 100 Mbps networks for all households; gigabit connectivity for key businesses and institutions; uninterrupted 5G coverage for all urban areas and major transport paths; and access to mobile data everywhere.

An independent EU 5G Observatory quarterly report and study produced for the European Commission by VVA, Policytracker, and LS Telecom under contract CNECT/2021/OP/0008, tracks the quarterly developments and trends of 5G in Europe. This consortium's 17th Quarterly study report for the Commission sets out the relevant progress / trends of 5G deployment in EU 27 as follows (October 2022)[20]:

- All EU countries have now commercial 5G service available at least in a part of the country
- A total of close to 256,074 5G base stations are now active in the EU
- The most common type of 5G base station makes use of 4G bands in a Dynamic Spectrum Sharing (DSS) configuration
- Approximately 72% of EU's population is covered by at least one 5G network

The path towards the Digital Decade will enable more and more innovations, some of which may also benefit from BEREC's technical expertise and input. BEREC will, through its three strategic pillars, continue to monitor progress and support these defined objectives.

# 3. Regulatory framework

Although the transposition deadline of Directive 2018/1972 establishing the European Electronic Communications Code (EECC) was 21 December 2020, during 2022 several EU Member States still continued working on its implementation. After the letters of formal notice sent in February 2022 to 24 Member States, the European Commission moved on to the infringement proceedings' second step and forwarded to the concerned Countries reasoned opinions, asking them to adopt the necessary transposition measures within a further two months. On 6 April 2022, the European Commission decided to refer 10 Member States to the Court of Justice of the European Union over their failure to fully transpose and communicate to the Commission how national measures transpose the EU Electronic Communications Code. As of December 2022, 24 EU Member States had completed the EECC transposition.

Throughout 2022, parallel to exerting its statutory advisory role vis à vis the Commission (e.g. on its legislative proposal on the new 116 helpline for victims of violence against women), BEREC has been following up on its additional duties as in the EECC and accordingly adopted the Opinion on the draft Commission Delegated Regulation supplementing Directive (EU) 2018/1972 of the European Parliament and of the Council with measures to ensure effective

[19] Europe's Digital Decade: digital targets for 2030 (europa.eu)
[20] QR-17-Final-v3-CLEAN.pdf (5gobservatory.eu)

access to emergency services through emergency communications to the single European emergency number '112'.

Furthermore, in order to enhance transparency, enable national regulatory authorities and, where applicable, other competent authorities, as well as operators, to have direct access to information about which numbering ranges can generate higher costs (termination rates) in all Member States, BEREC established a database for value-added services. BEREC also set up a database with the intention to help national operators, national regulatory authorities and, where applicable, other competent authorities to be informed of all means of access to emergency services deployed in the Union and also a database with the link to the national public warning mobile application. The establishment of these databases was an obligation stemming from Article 16 of the Roaming Regulation.

BEREC also kept on operating as an open floor for its member NRAs to exchange views on any national transposition, as well as further matters.

# 4. Developments relating to the Openness of the Internet

In light of the rulings[21] of the Court of Justice of the European Union (CJEU)regarding the application of the Open Internet Regulation (EU) 2015/2120 (OIR) and the implications of those rulings, BEREC launched a public consultation on the draft updated BEREC Guidelines on the Implementation of the Open Internet Regulation in March 2022, and published the final Guidelines[22] in June 2022.

Since the publication of the CJEU rulings, NRAs organised their respective national enforcement and supervision actions concerning zero-rating products available on the national markets. BEREC issued an internal questionnaire to collect and share more detailed information about the current market situation and NRA actions regarding zero-rating offers. A summary of the status mid-November 2022 is provided in the Opinion for the evaluation of the application of the Open Internet Regulation, mentioned below.

In 2022, BEREC provided clarity, with regard to the OIR, to internet service providers (ISPs) in implementing media sanctions against Russian media outlets. The Regulations[23] prohibit broadcasting or distribution within the EU of any content by Russian state media outlets Russia Today (RT), Sputnik, Rossiya RTR / RTR Planeta, Rossiya 24 / Russia 24, TV Centre International, NTV / NTV Mir, Rossiya 1, REN TV and Pervyi Kanal.

---

[21] Three German cases: C-34/20 Telekom Deutschland (StreamOn, video throttling); C-5/20 Vodafone (Vodafone Pass, tethering); C-854/19 Vodafone (Vodafone Pass, roaming).

[22] BEREC Guidelines on the Implementation of the Open Internet Regulation,BoR (22) 81, see: https://www.berec.europa.eu/en/document-categories/berec/regulatory-best-practices/guidelines/berec-guidelines-on-the-implementation-of-the-open-internet-regulation-0

[23] Regulation (EU) 2022/994, see: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32022R0994#ntr1-LI2022167EN.01000101-E0001;
Regulation (EU) 2022/879, see: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2022.153.01.0053.01.ENG;
Regulation (EU) 2022/2474, see: https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32022R2474&qid=1680509000428&from=en

Furthermore, BEREC provided a forum for NRAs to share information and to enable the consistent application of the OIR for all of the topics related to the OIR.

In December 2022, BEREC issued its Opinion for the evaluation of the application of the Open Internet Regulation[24]. With this Opinion, BEREC provided input to the European Commission for its second report to the European Parliament and the Council on the review of the OIR, due by 30 April 2023. As a conclusion, BEREC considers that the OIR works and continues to be fit for purpose and therefore BEREC sees no merit in changing the text of the OIR.

To contribute to the debate on a potential contribution from content and application providers (CAPs) to network investments, in June 2022, BEREC initiated a new work item assessing the IP interconnection ecosystem and impact of the sending-party-network-pays principle on this ecosystem and on end-users. In October 2022, BEREC published a preliminary assessment of the underlying assumptions of payments from large CAPs to ISPs[25]. The activities related to this work item will continue in 2023.

In 2022, BEREC members continued to collaborate to help improve their respective internet access services (IAS) quality measurement tools or to introduce a new tool. The relevant working group provided a forum for the exchange of best practices, and collected information regarding Open Data interfaces for IAS measurement tools.

Following the public consultation launched in December 2021, BEREC issued the final version of its net neutrality regulatory assessment methodology (NN RAM) in June 2022. The objective of the methodology is to help NRAs in the monitoring and supervision of the provisions of the OIR, based on various net neutrality measurement tools.

# 5. International roaming developments

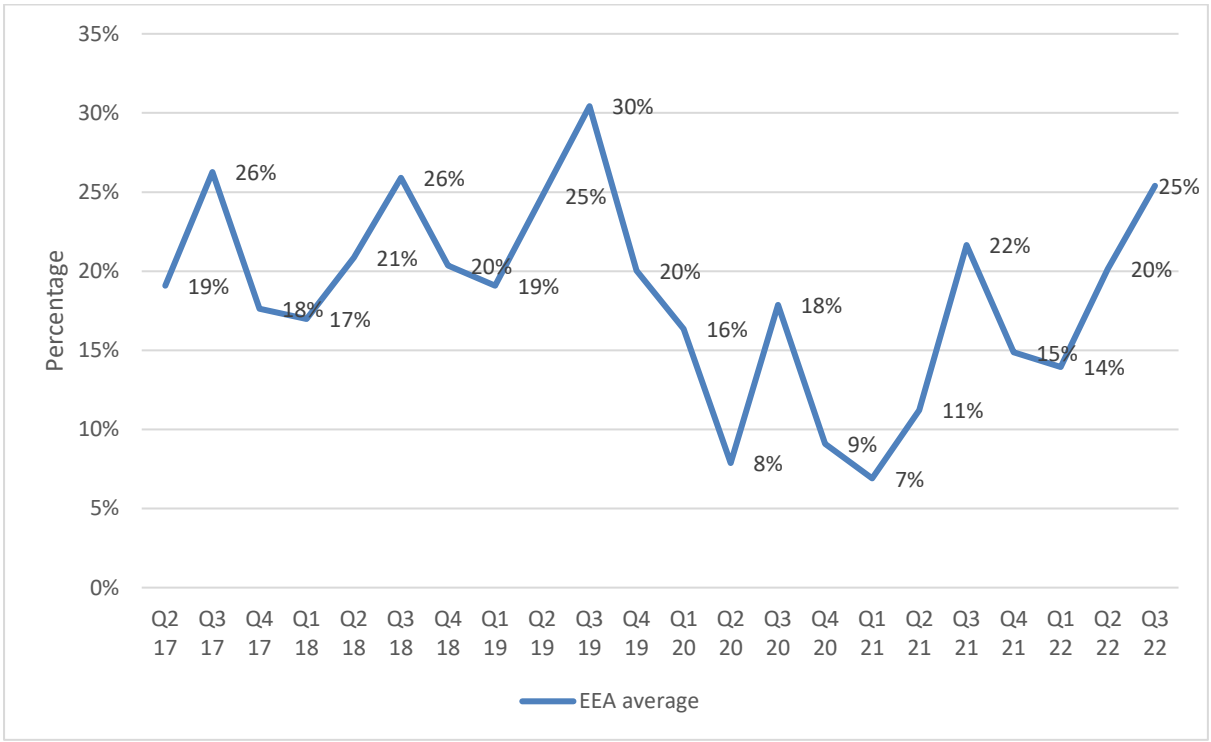
Roaming charges in the European Union and the European Economic Area (EEA) became a thing of the past on 15 June 2017. The Roaming Regulation (Regulation (EU) 2015/2120, published in the Official Journal of 26 November 2015, amending Regulation (EU) No 531/2012) entered into force, enabling consumers to use their mobile phones anywhere in the EU, just like in their home country, without any additional surcharge ('Roam Like at Home' – RLAH). Only in exceptional cases may the operator levy a surcharge for EU roaming. In July 2022 the new Roaming Regulation (EU) 2022/612 came into force. This regulation maintains RLAH provisions and also inserts additional provisions about QoS, transparency, emergency communications, VAS, etc. To assess the competitive developments and the impact of RLAH on the EU-wide roaming markets, BEREC regularly collects data from NRAs on the development of retail and wholesale charges for regulated voice, SMS and data roaming services. It also includes wholesale charges applied for balanced and unbalanced roaming traffic. BEREC must also collect data on wholesale roaming agreements that are not subject

[24] BoR (22) 163, BEREC Opinion for the evaluation of the application of the Open Internet Regulation, see: https://www.berec.europa.eu/en/document-categories/berec/opinions/berec-opinion-for-the-evaluation-of-the-application-of-regulation-eu-2015-2120

[25] BoR (22) 137, BEREC preliminary assessment of the underlying assumptions of payments from large CAPs to ISPs, see: https://www.berec.europa.eu/en/document-categories/berec/opinions/berec-preliminary-assessment-of-the-underlying-assumptions-of-payments-from-large-caps-to-isps

to the maximum wholesale roaming charges, and on the implementation, at wholesale level, of contractual measures that aim to prevent permanent roaming or anomalous or abusive usage of wholesale roaming access for purposes other than roaming. On the basis of the data collected, BEREC reports regularly on the evolution of pricing and consumption patterns in the Member States for both domestic and roaming services, the evolution of actual wholesale roaming rates for unbalanced traffic between roaming providers, and the relationship between retail prices, wholesale charges and wholesale costs for roaming services. The new Regulation amended slightly the data collection provisions moving from biannual to annual data collection and including additional indicators. The introduction of RLAH services, coupled with the growing demand for data services, has changed the international roaming market. A relevant point is that RLAH services have enabled a substantial increase in international roaming traffic. The BEREC data collected for the latest BEREC Report demonstrates the recovery of the roaming market from the Covid-19 pandemic during 2022. The ratio of roaming subscribers has increased since the respective quarters of 2020, but it is still less below pre-pandemic levels. A similar tendency can be observed for the volumes of the roaming calls made.

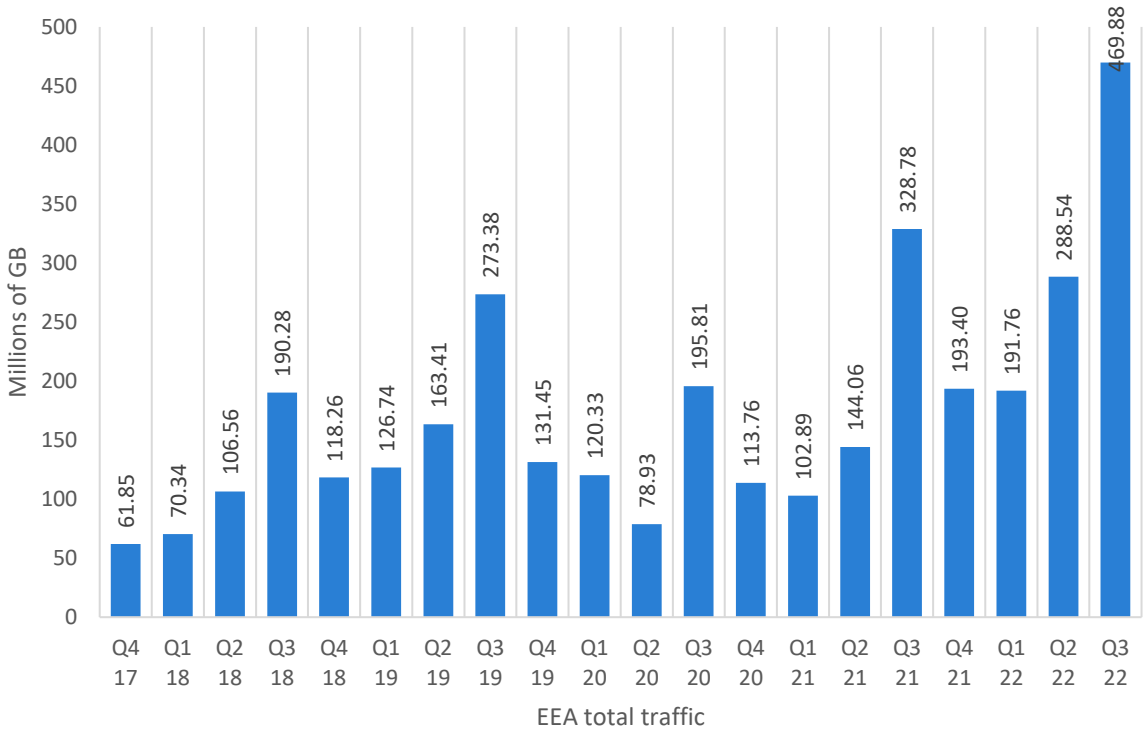
*Figure 5: Actual roaming subscribers as ration of roaming enabled users*




*Source: BEREC*

For data roaming traffic, the volumes are above the pre-pandemic period, but roaming data traffic is also impacted by the general trend of increased data consumption which occurs at the domestic level as well.

*Figure 6: Evolution of total EEA roaming data consumption*




*Source: BEREC*

# 6. Conclusions

Europe has set ambitious connectivity targets, reaching for full connectivity, i.e. gigabit connectivity for all and 5G in all populated areas. BEREC enables and underpins these ambitions by stimulating the roll-out of high capacity networks and sustaining open digital markets, fostering competition and innovation to achieve these goals and get households and businesses connected. In 2022, clear progress was realised. The use of Next generation Access networks has shown a significant increase and Very High Capacity Networks are on the rise as well, be it at a more steady pace. Mobile broadband is now widely used in Europe, with 24 EU member states having a large majority of people (>80%) using mobile broadband.

At the same time we observe that national differences still exist, as geography, history but also tax systems differ from one country to another. But we also witness an ongoing harmonisation of regulatory practice, contributing to the realisation of the single European digital market. One first example in 2022 being the consistent implementation of the ruling of the CJEU on zero rating. Another example is the implementation of the new Roaming Regulation, which is strengthened on BERECs request with parameters on QoS. Now, European citizens can benefit from true Roam Like at Home. It is in these examples that the European single digital market delivers to Europe's businesses and people.

# PART B: Annual Report on BEREC activities in 2022

Annual Report on BEREC activities in 2022, in accordance with Article 22 of Regulation (EU) No 2018/1971 of the European Parliament and of the Council of 11 December 2018 establishing the Body of European Regulators for Electronic Communications (BEREC) and the Agency for Support for BEREC (BEREC Office)

## 1. Introduction

In this Annual Report, the activities of the Body of European Regulators for Electronic Communications (BEREC) in 2022 are presented in accordance with Article 22 of the BEREC Regulation.

The report focuses on the workstreams and priorities stated in the BEREC Work Programme 2022 and updated throughout the year. All activities are mainly carried out by BEREC's WGs and ad hoc WGs. The final documents (among them BEREC Guidelines, Opinions, Reports and others) were published after approval by BEREC's Board of Regulators.

The objectives of BEREC's 2022 work were aligned with the BEREC 2021–2025 Strategy[26], the three high-level priorities (promoting full connectivity, supporting sustainable and open digital markets, empowering end-users), and the priorities set for institutional and international cooperation. In addition to the three high-level priorities, the facilitation of successful implementation and consistent application in all areas of the EECC, including spectrum, universal service and consumer protection, are important horizontal principles that form an essential part of the high-level priorities.

A key policy objective is to ensure that VHCNs and 5G services are available in a timely manner. In this regard, BEREC worked intensively on several essential tasks that have been entrusted to BEREC by the co-legislators. In addition, BEREC provided guidance to the co-legislators and the European Commission on a number of initiatives.

In 2022, much of the BEREC work shifted from providing Guidelines related to the EECC towards assessing future technological and market developments within the scope of electronic communications and the digital ecosystem.

BEREC also aimed to contribute, through cooperation with other competent institutions and stakeholders, to ensure that future network technologies meet their connectivity targets in line with European values and interests (for example (cyber)security, protection of the end-user and environmental sustainability challenges).

[26] BoR (20) 108, see: https://www.berec.europa.eu/en/document-categories/berec/berec-strategies-and-work-programmes/berec-strategy-2021-2025

# 2. Work Programme 2022

## 2.1. Strategic priority 1: Promoting full connectivity

### 2.1.1. Report on a consistent approach to migration and copper switch-off (Carry-over)

The requirements concerning the capabilities of electronic communications networks are constantly increasing and the response towards that demand is to bring optical fibre closer and closer to the end-user. Therefore, the importance of the copper-based access network decreases and NRAs are increasingly confronted with the situation where the SMP operator (SMPO) wants to decommission its legacy copper-based access network and to close related network elements e.g. main distribution frames (MDFs).

The objectives of this report are: (i) to provide an overview of the current status of the SMPOs' copper switch-off and the SMPOs' plans to switch off their copper network in the future; (ii) to analyse in detail the rules set by the NRAs for the migration process and copper switch-off; and (iii) to examine also further aspects of the migration process and copper switch-off (e.g. the SMPO's framework for migration and copper switch-off). Finally, the report aims to identify a consistent approach to migration and copper switch-off.

The report shows that in 20 of the 32 European countries where the NRA provided data (as of June 2021) the SMPO has already announced that it plans to switch off its legacy copper access network (e.g. close MDFs), in 13 of them the SMPO has already closed copper-based network elements (e.g. MDFs) and in 17 countries the NRA has already set rules for the migration process and copper switch-off.

A consistent approach to migration and copper switch-off results from the detailed analysis of the rules set by the NRAs in these 17 countries. It includes, among others, the following:

- Type of procedure: The NRAs typically set the rules for the migration process and the copper switch-off in a market analysis procedure.
- Scope of the rules: The rules set by the NRA apply to the SMPO and to the geographic area where the NRA imposed access remedies on the SMPO (in accordance with Article 81(1) EECC).
- Stakeholder involvement: NRAs normally involve the stakeholders by means of a public consultation of the draft measures according to Art 23(1) of the EECC. Depending on national law (transposition of Article 31(1) of the EECC), stakeholders are also parties in the (market analysis) procedure which sets the rules for the copper switch-off. In certain circumstances further stakeholder involvement is appropriate.
- Notice period: The notice period typically is 6 to 12 months when alternative network operators (ANOs) do not use any SMPO's copper-based wholesale access product, 1 to 3 years when ANOs use Virtual Unbundled Local Access (VULA) or bitstream (same point of handover after copper switch-off) and 2 to 3 years when ANOs use copper-based Unbundled Local Loop (ULL). However, depending on national circumstances, the notice periods may be shorter or longer.

- Alternative wholesale access products: The fibre-based wholesale access products imposed on the SMPO as a 'usual' remedy in a market analysis procedure are typically sufficient for the copper switch-off. Depending on national circumstances, however, copper switch-off specific alternative wholesale access products may also be necessary.
- Legacy copper-based wholesale access products: The legacy copper-based wholesale access products are normally also imposed on the SMPO in a market analysis procedure. Typically, the SMPO has to provide the legacy copper-based wholesale access products until the copper is switched off (e.g. MDF closure).
- Migration costs: The NRAs typically apply price regulation to the legacy copper-based wholesale access products and the alternative wholesale access products in a market analysis procedure. In many cases, there is no need for further rules on the migration costs. However, in order to avoid competitive distortions, further rules on migration costs could be useful under specific circumstances.

**Document:**

BoR (22) 69: Report on a consistent approach to migration and copper switch-off

BoR (22) 68: BEREC Report on the outcome of the public consultation on the draft BEREC Report on a consistent approach to migration and copper switch-off

### 2.1.2. Report on regulatory treatment for fixed and mobile backhaul (Carry-over)

Backhaul infrastructure is key to enabling 5G and facilitating the deployment of very high-speed networks in areas that are not densely populated. Moreover, the recommendation on relevant markets that entered into force in December 2020 addresses the issue of how to take account of backhaul in the process of market analyses by NRAs.

In 2022 BEREC published a report on the regulatory treatment of fixed and mobile backhaul (BoR (22) 33) which presents the legal provisions applicable to mobile and fixed backhaul, the regulation and use of different types of backhaul networks and services in Europe, and the views expressed by operators on their current and future needs for backhaul.

The report is based on the responses received to two BEREC questionnaires, one for NRAs on the regulatory treatment of backhaul in each country, and another for operators where data on actual use of different backhaul technologies as well as views on the regulation and future use of backhaul were collected.

The final report takes account of the responses received during the public consultation (October 2021) and a report on its outcome was published together with the final report (BoR (22) 32).

**Document:**

BoR (22) 33: BEREC Report on the regulatory treatment for fixed and mobile backhaul

BoR (22) 32: BEREC Report on the outcome of the public consultation on the Draft BEREC Report on the regulatory treatment for fixed and mobile backhaul

### 2.1.3. Report on the 5G Ecosystem[27]

The technical features of 5G-based services aim to meet the specific needs of vertical industries bringing new use cases and customised solutions. It also implies changes at the network layer such as the virtualisation of some of its elements. All these developments may entail significant changes in the dynamics of both the supply chain and on the demand side.

In this report, BEREC addressed the 5G ecosystem with a twofold objective: analysed some fundamental elements of the 5G provision and identified the potential impact on regulation of the 5G ecosystem. Namely, BEREC has focused its analysis on three fundamental elements: the main players in the 5G ecosystem, the 5G value propositions, and the cost structures and revenue streams.

BEREC underlines the role of traditional market players in the rollout of 5G networks and fostering verticals demand of 5G based products. However, the merge between IT and telecommunications competences needed for the delivery of 5G products may entail new roles undertaken by new players as 5G evolves and reaches maturity. These new roles in the 5G ecosystem include new equipment suppliers, system integrators and managed service providers (MSPs), cloud network providers and 5G verticals. In such a scenario, a possible outcome could be that new players may specialise in the provision of platform operation as traditional players undertake the network domain operation. Additionally, the design of specialised products for verticals is expected to lead to different combinations of partnerships among all players.

The 5G value propositions take into consideration, on the one hand, the benefits that 5G technical features bring to the provision of new and/or enhanced products. These include improved electronic communications services (ECS); 5G private networks; multi-access edge computing (MEC); enhanced network functionalities relying also on a cloud-native architecture; Open RAN; and system integration. On the other hand, the value proposition considers the demand side with the growth of Business to Business (B2B) products and the solutions for verticals.

BEREC has looked over the costs in the deployment and operation of the network as well as the costs for the verticals to adopt the new technology. With regard to the revenues, two main sources are identified: enhanced user ECS, especially Internet Access Services (IAS), and digital transformation of vertical industries.

At the present early stage of the development and the uptake of the 5G ecosystem, most NRAs have not received formal complaints specifically related to 5G regulatory issues.

Nevertheless, as a response to the calls for input for the elaboration of this report, stakeholders pointed out several potential concerns for the attention of regulators. These are mainly related

[27] Title by the WP2022: ‘Report on the 5G Value Chain’’.

to the return on the investments needed for the deployment of 5G and ways to ensure competition. BEREC notes that the 5G ecosystem is still at an early stage and considers that it is still too early to conclude what specific 5G regulatory measures should be taken. BEREC recommends that regulators monitor the developments in the market and keep a steady and constant communication with stakeholders, this report being part of this effort by NRAs.

| **Document:** |
| --- |
| BoR (22) 144: BEREC Report on the 5G Ecosystem |

### 2.1.4. Workshop on Open RAN

The Radio Access Network (RAN) is the fundamental basis of mobile networks. To serve unique demands and requirements, the RAN is evolving in architecture and function. In particular, equipment vendors and new market players are working to open up equipment interfaces to leverage cost efficiencies and innovations in the RAN. In addition, together with new technologies and coupled with artificial intelligence and virtualisation/cloud, the traditional notion of a mobile network is transforming.

On 24 May 2022 BEREC conducted an external workshop on Open RAN. The purpose was to develop an understanding of the concept of mobile infrastructure deployment and development using Open RANs.

BEREC invited expert speakers from regulators, policy-makers and industry to explore potential future areas of enquiry for BEREC on Open RAN.

The workshop helped to shine a light on differences in terms of what is mature and what is less mature as regards some of the open interfaces at the heart of Open RAN. For example, the interface to the radio unit is more mature in terms of specifications than other interfaces between centralised and distributed units, and between the radio intelligent controller. In particular, expert presenters discussed some of the latest innovations arising from the open interface between the Radio Unit and the Centralised Unit, as well as other innovations from open interfaces between the Centralised Unit and Distributed Units. Other experts set out some of the demand-side issues including use cases (industrial test-bed level examples, etc.). Another expert set out that Open RAN is a live feature in its mobile network today and that it is expected to be a significant concept in the mobile telecommunication networks generally – a point of discussion by panellists.

Some expert presenters set out that improved access to radio spectrum resources would be an important criterion to help enterprise-wide use cases benefit from Open RAN in the future; a sort of call for a more lightly licensed spectrum as opposed to competitive auctions, which they claimed were unsuited to satisfy the connectivity needs of smaller players or private network operators. Another expert suggested that access to a licensed radio spectrum should be continued and would be important in next generations of mobile technologies.

There were 234 registrations for the workshop. The workshop was well attended by 194 participants (NRAs, OCAs, European Commission, organisations, associations, operators,

vendors, consultants, ministries, governmental agencies, regulators, etc.) and BEREC is grateful to all participants for sharing their views.

**Document:**

BoR (22) 138: Summary Report on BEREC Open RAN workshop, 24 May 2022

### 2.1.5. Report on satellite connectivity for universal service

Several geostationary (GSO) and non-geostationary (NGSO) satellite networks and systems are available, or become available within the 2022-2025 timeframe, which can provide satellite connectivity (Satcom) broadband services to end-users that use appropriate customer premises equipment.

In view of this, BEREC's report considers the potential of Satcom solutions to provide ubiquitous broadband connectivity for Universal Service in Europe.

Essentially, the report is based on the results of a questionnaire issued to BEREC Members and Participants without voting rights. Summary pie charts are used to illustrate the factual information. In addition, issues explored in the report include regulatory steps needed (in terms of authorising relevant aspects of satellite services), projected Satcom capacities (in terms of capacity / latency etc), the suitability of internet access via satellite, expected improvements in Satcom solutions generally, and other relevant dimensions. The report includes the views of thirty NRAs. Views from ten respondents to the consultation were also carefully considered by BEREC in its final analysis.

The report underlines that there are a number of regulatory issues having a national dimension, which supports a case-by-case approach to Satcom solutions for Universal Service in Europe. In particular, two NRAs indicate that Satcom solutions contribute to Universal Service presently, two NRAs are studying Satcom solutions for same, while the remaining NRAs set out that they have no firm plans or do not envisage such a role for Satcom.

**Document:**

BoR (22) 169: Report on Satellite connectivity for Universal Service

### 2.1.6. Workshop to share experience on the implementation of Article 22 EECC

Article 22 of the EECC requires Member States to conduct a geographical survey of the reach of electronic communications networks capable of delivering broadband by the end of 2023. During 2020 and 2021, BEREC published a series of Guidelines aiming at a consistent implementation of this Article, which are compiled in a BEREC Handbook[28].

[28] BoR (21) 104, see: https://www.berec.europa.eu/en/document-categories/berec/regulatory-best-practices/guidelines/handbook-of-berec-guidelines-on-geographical-surveys-of-network-deployments

During 2022, BEREC provided the opportunity for stakeholders, NRAs and OCAs to exchange ideas regarding the implementation of the obligations. Two workshops were held: one, on 15 September, attended by 72 participants, where stakeholders expressed their views on the implementation, another, on 25 October, attended by 56 representatives, where NRAs and OCAs discussed different technical and non-technical aspects of broadband maps, such as address level reporting, peak time conditions and traffic modelling, verification, collaboration with operators and good practices in publication.

In 2024, BEREC is to continue work on Article 22 EECC as an implementation report of the broadband mapping obligation is planned to be performed.

### 2.1.7. Report on competition amongst multiple operators of NGA-networks in the same geographical region

Regional operators of VHCN / NGA networks play an increasingly important role on the broadband market in many European countries and they may use different business strategies, e.g. to differentiate (or not) prices across their networks. BEREC already published a Common Position on geographical aspects of market analysis in 2014[29] and a report on the application of this Common Position in 2018[30]. This report is built on these previous BEREC activities and its objectives are: (i) to examine the extent to which multiple NGA networks are present in the same geographical area and the resulting impact on retail prices and retail product characteristics and (ii) to analyse the impact this had on the market for wholesale local access provided at a fixed location, considering both cases where market definition and/or remedies have been geographically differentiated and where this is not the case. The report is based on data collected from NRAs of 31 European countries in April 2022.The main findings of the report are as follows.

*Presence of multiple NGA networks in the same geographical area*

The number of NGA networks present in the same geographical area differs significantly and the area covered by two NGA networks is in many countries 11-50% homes passed (HP), the area covered by three NGA networks is in most countries 0-25% HP and the area covered by more than three NGA networks is in most countries 0-10% HP. Differences in retail prices and/or retail product characteristics between geographical areas have been investigated by 18 countries and only three of them found differences in retail prices and one in retail product characteristics.

*Outcome of the geographical analysis in the last market analysis of market 1/2020 compared with market 3a/2014*

In four countries, the analysis resulted in a deregulation of this market and one country had never regulated. Six countries defined sub-national geographical markets, one of them implemented also a geographic differentiation of remedies in a sub-national geographic

[29] BoR (14) 73, see: https://www.berec.europa.eu/en/document-categories/berec/regulatory-best-practices/common-approachespositions/berec-common-position-on-geographic-aspects-of-market-analysis-definition-and-remedies

[30] BoR (18) 213, see: https://www.berec.europa.eu/en/document-categories/berec/reports/berec-report-on-the-application-of-the-common-position-on-geographic-aspects-of-market-analysis

market, five other countries a geographic differentiation of remedies in a national market and 15 countries did not adopt any geographical differentiation.

The main reasons for the geographic differentiation of market definition and/or remedies in the countries where such a differentiation was adopted are: in nine countries geographical differences in coverage of alternative networks (e.g. cable or fibre), in seven countries (also) geographical differences in retail market shares of the incumbent, in four countries (also) geographical differences in wholesale market shares of the incumbent, in four countries also population density (economies of scale), in three countries also geographical differences resulting from commercial wholesale offers of alternative operators, and in four countries there is also one other main reason.

The reasons why the 15 countries did not decide to geographically differentiate market definition and/or remedies are that the presence of multiple NGA networks did not result in sufficient competitive differences between geographical areas in 12 countries and that the geographical area(s) where multiple NGA networks are available is still small and negligible in three countries. In four countries there is one other reason.

Country case studies on a particularly high number of regional operators showed the following: In Finland, the NRA defined 150 sub-national geographical markets, however, only 21 operators have SMP and all are historical incumbents and, therefore, this is manageable. In Denmark, the NRA defined 21 sub-national geographical markets, 10 operators have SMP, and nine of them are not the historical incumbent but regional operators. In Sweden, the NRA has not (yet) decided a geographical differentiation of market definition, however, there are indications of a potentially large number of sub-national geographical markets that might be burdensome to administrate.

**Document:**

BoR (22) 188: Report on competition amongst multiple operators of NGA networks in the same geographical region

### 2.1.8. BEREC Report on the regulatory treatment of business services

Business services consisting of, or based on, electronic communication services are a key input to ensure that the EU companies and public administrations can benefit from the digital economy. They allow for better provision of new innovative services for citizens and increase productivity and competition in a globalised world.

Building on a comprehensive questionnaire sent to all BEREC members in June 2022, as well as on the input received in a workshop with stakeholders´ associations organised in October 2022, the report presents the regulatory treatment of wholesale inputs used for retail business services throughout Europe. Regarding SMP regulation, it provides a snapshot of the markets in which wholesale products used for business services are regulated, including their geographical scope and the remedies applied, as well as insights on markets definition. When applicable, the report also addresses symmetric regulation applied in the context of business users. The report also highlights some good practices used by NRAs to encourage effective and sustainable competition, as well as investment and innovation on business services.

The report was opened to public consultation in December 2022 and the final report is expected in June 2023.

**Document:**

BoR (22) 185: Draft BEREC Report on the regulatory treatment of business services

### 2.1.9. External study on Communication Services for Businesses in Europe: Status Quo and Future Trends[31]

In recent years, business services have evolved and are expected to evolve even more to include new high-speed services supported by the deployment of very high capacity fixed and mobile networks. Moreover, business services are increasingly being provided in combination with additional services, typically IT services.

With the purpose of getting a better understanding on how these services are evolving, BEREC contracted an external study that aimed to bring new insights on European business services. The study was prepared by Decision & Kantar and is based on a comprehensive survey of 1,000 business users and 18 interviews with operators in five EU countries. The key objective of this study is to have an EU view on how business services are evolving and are expected to evolve in the coming years, including speeds, QoS and technologies and new emerging offers combining IT services. The study provides a comprehensive view of the actors in the market, the types of offers for these services and the demand by different types of business customers.

The findings of the study will feed into BEREC's upcoming work on different topics, including the BEREC final report on the regulatory treatment of business services (see the corresponding PRD).

**Document:**

BoR (22) 184: Study on Communication Services for Businesses in Europe: Status Quo and Future Trends

## 2.2. Strategic priority 2: Thriving sustainable and open digital markets

### 2.2.1. Report on the internet ecosystem (Carry-over)

Electronic communication services (ECS) and electronic communication networks (ECN) are part of a vast internet ecosystem that allows users and society as a whole to offer and benefit from the extraordinary potential of a large variety of services provided via the internet. Like

[31] Title by the WP2022: 'External study on evolution of business services''.

any other ecosystem, the internet is composed of many interrelated elements that affect each other.

The BEREC report on the internet ecosystem provides a comprehensive view and analysis of all the internet ecosystem's elements: electronic communication services and networks, the server side as well as other elements used to access, distribute and share content and applications online, such as devices, operating systems, app stores, browsers or cloud services among others.

The report also highlights how the users' internet experience is affected by many different elements that are largely dominated by the Big Tech companies (e.g. operating systems, app stores, etc.). A small number of digital platforms have now reached a position that allows them to shape and restrict both the competition dynamics on different elements and the openness under which content, services and information can be accessed and shared.

The final report takes into account the responses received during the public consultation (during June and July 2022) and a report on its outcome was published (BoR (22) 166) together with the final report.

**Document:**

BoR (22) 167: BEREC Report on the Internet Ecosystem

BoR (22) 166: BEREC Report on the outcome of the public consultation on the Draft BEREC Report on the internet ecosystem

### 2.2.2. Report on the impact of Artificial Intelligence (AI) solutions in the telecommunications sector on regulation

Although most artificial intelligence (AI) systems in the telecommunications sector are still in a development phase, AI is expected to play an important role in the sector in the mid-term. This BEREC report seeks to identify these developments in selected use cases, to assess if those use cases may have an impact on regulation, and to raise further awareness of the different use cases as well as the benefits and risks of opportunities regarding the application of AI in the sector.

While AI is progressively being deployed in all types of economic and societal activities, this BEREC report is focused on delivering a high-level view of the application of AI solutions for the provision of electronic communication networks and services (ECN/S), on the one hand, and of AI solutions used for regulatory purposes, on the other hand.

The report also describes some fundamental elements of AI solutions as well as the European legal framework regarding AI.

The six described use cases of AI in the telecommunications sector concern Network and Capacity Planning and Upgrades; Channel Modelling, Prediction and Propagation; Dynamic Spectrum Sharing; Quality of Service Optimisation and Traffic Classification; Security Optimisation and Threat Detection and Fraud Detection and Prevention

BEREC concludes that, although the potential benefits of AI are paramount, the risks associated with it are also there. Good decision making depends on unbiased and reliable data. How the algorithms use the data is often not clear, possibly leading to a lack of trust in the automated decision making. Privacy and security remain important aspects that justify close monitoring of AI solutions. Whereas operators have found many ways to apply AI solutions, the NRAs seem more reluctant to make use of AI. Literature and some examples from European regulators, or regulators from outside Europe, show that there are a good number of use cases for AI. AI solutions could be used for policy making, public services or internal management. BEREC expects AI to mature more over the years, both with operators and with NRAs. BEREC signals that NRAs could play a role in the implementation of the AI Act at national level, in particular when AI is used in the provision of ECN/S by coordinating with other relevant bodies and providing technical support in based on their specialised knowledge and experience in the sector. NRAs should also be equipped to address sectoral competition concerns that might arise in the future regarding the application of AI.

BEREC has approached market players and academics for this study. The response was limited. The report is further based on information from NRAs and extensive desk research. A public consultation was started after the fourth plenary meeting.

**Document:**

BoR (22) 191: Draft Report on challenges and benefits of Artificial Intelligence (AI) solutions in the telecommunications sector (including use cases)

### 2.2.3. Collaboration on net neutrality measurement tools and evolution of the regulatory assessment methodology (Carry-over)

In 2022, BEREC members continued to collaborate to help improve their respective IAS quality measurement tools or to introduce a new tool. The relevant working group provided a forum for the exchange of best practices, and collected some information regarding Open Data interfaces for IAS measurement tools.

In June 2022, BEREC published the final version of its updated regulatory assessment methodology (RAM). This methodology is intended to provide guidance to NRAs in relation to the monitoring and supervision of the provisions of the Open Internet Regulation (OIR), and the possible implementation of net neutrality measurement tools on an optional basis. This methodology is also intended to contribute to the harmonisation of net neutrality measurement methodologies. This updated work builds upon previous BEREC guidance on net neutrality, IAS quality monitoring and best practices.

The report covers the following topics:

- Guidance on a harmonised quality of service (QoS) measurement methodology. The speed measurement methodology is, by default, based on multiple transport layer connections, and the document describes the subsequent calculation of the measured speed.

- Recommendations on methods for detecting traffic management practices that impact on individual applications and include recommendations for detecting traffic management practices that affect connectivity and ultimately a possibility of using and providing individual applications.
- The most important factors that should be considered when assessing the measurement results and giving guidance on information collection. Thus, a number of end-user environment factors may impact the results. These factors include Wi-Fi usage, modem and computer performance, and radio conditions when measuring speed for a mobile subscription.
- Recommendations for the validation, post-processing and market-level analysis of the collected measurement results.
- Guidance on the criteria that NRAs could take into account when providing their own certified monitoring mechanism or certifying a third-party mechanism.

A draft of the updated RAM was issued for public consultation from 15 December 2021 to 28 January 2022. In total, BEREC received five contributions to the public consultation, which are published on the BEREC website.

**Document:**

BoR (22) 71: BEREC Report on the outcome of the public consultation on the draft Net Neutrality Regulatory Assessment Methodology

BoR (22) 72: BEREC Net Neutrality Regulatory Assessment Methodology

### 2.2.4. Implementation of the Open Internet Regulation and the BEREC Open Internet Guidelines[32]

Since the publication of the CJEU rulings (also see the following section) and throughout 2022, NRAs organised their respective national enforcement and supervision actions. BEREC also provided a forum for NRAs to share information and to enable the consistent application of the OIR.

BEREC published its annual report on the implementation of the OIR in October 2022, covering the period from 1 May 2021 to 30 April 2022. This report provides an overview of the activities of the NRAs in the course of implementing the OIR and associated BEREC Open Internet Guidelines. To prepare this report, BEREC gathered information from 28 NRAs via an internal questionnaire. The report shows that NRAs have actively implemented the OIR. It is evident that during the sixth year of the application of the OIR, the adoption of monitoring methods has increased as compared to the previous years. Moreover, quite a few NRAs have

[32] Title by the WP2022: 'Implementation of Regulation (EU) 2015/2120 and the BEREC Guidelines on the implementation of the Open Internet (OI) Regulation''

dealt with zero-rating and traffic management cases and a handful of formal decisions were reached.

**Document:**

BoR (22) 128: BEREC Report on the implementation of the Open Internet Regulation 2022

### 2.2.5. Update to the BEREC Guidelines on the Implementation of the Open Internet Regulation

In June 2022, BEREC published an update of its BEREC Open Internet Guidelines to reflect the three judgments of the CJEU concerning three German cases issued on 2 September 2021:

- C-34/20 Telekom Deutschland (StreamOn, video throttling)
- C-5/20 Vodafone (Vodafone Pass, tethering)
- C-854/19 Vodafone (Vodafone Pass, roaming)

The three cases consist of internet access services offers including a 'zero tariff' or 'zero-rating' option. This means that the traffic generated by specific (categories of) applications is not counted towards the data volume of the basic package.

All three judgments refer to the obligation of equal treatment of traffic (OIR Article 3(3)) and the practice of differentiated billing based on commercial considerations (note: in only one of the three cases was differentiated traffic management with an impact on the QoS of the traffic in place).

In BEREC's understanding, these practices are deemed incompatible with European law according to the judgments. As a consequence, BEREC revised its Guidelines accordingly. Throughout this process, the European Commission has cooperated closely with BEREC.

A draft of the updated Guidelines was issued for consultation from 15 March to 14 April 2022. 20 contributions were published, as two stakeholders provided a confidential version only. One additional contribution was received after the above-mentioned deadline and has thus not been taken into account for this public consultation.

**Document:**

BoR (22) 80: BEREC Report on the outcome of the public consultation on the draft BEREC Guidelines on the Implementation of the Open Internet Regulation

BoR (22) 81: BEREC Guidelines on the Implementation of the Open Internet Regulation

### 2.2.6. BEREC's statement and high-level opinion on the Draft Data Act

The European Commission has proposed a draft Regulation on harmonised rules on fair access to, and use of, data: the Data Act. When it became clear that certain responsibilities from that act may, through national decisions, be assigned to ECS/ECN regulators, BEREC decided to publish a short statement on this draft.

The draft statement expresses that the draft has BEREC's attention, and that BEREC is preparing a more substantive input, and offers its advice to the European Institutions. Subsequently, in November BEREC has published a high-level opinion.

The above responsibilities concern switching between data processing services (as described in chapter 6 of the draft act). Some other important topics in BEREC's high-level opinion concern the proposed users' rights related to data generated by IoT and related services; dispute resolution, and other governance aspects.

BEREC has reached out to the European Institutions, and offered its availability and experience for further engagement on these topics.

**Document:**

BoR (22) 54: BEREC's statement on the draft Data Act

BoR (22) 118: BEREC High-Level Opinion on the European Commission's proposal for a Data Act

## 2.3. Strategic priority 3: Empowering end-users

### 2.3.1. Workshop on the application of the rights of end-users in the EECC

Article 123 of the EECC introduces a specific review procedure on end-user rights, where BEREC publishes an opinion on the market and technological developments regarding the impact on end-users' rights. The European Commission, taking utmost account of the BEREC opinion, is required to publish a Report on the application of Title III of Part III ('end-user rights') and submit a legislative proposal to amend that Title where it considers this to be necessary to ensure that the general objectives set out in Article 3 of the EECC continue to be met.

In this context, BEREC organised, jointly with BEUC, an online Workshop on the Application of End Users' Rights that was held on 29 November of 2022.

Participants from BEREC, BEUC, the European Commission, National Regulatory Authorities, National Consumer Associations and Research Institutes discussed how market and technological developments are affecting the rights of end-users and their ability to make free and informed choices and to easily switch their providers of electronic communications services, and whether any lack of these abilities has caused or is causing market distortions or end-user harm. Presentations from BEREC, BEUC, and the European Commission took place during the first part of the Workshop. Following, there were two panel discussions of

experts exchanging views and experiences on the application of end-user rights provisions of the EECC and on how to strengthen end-user empowerment regarding contractual information and switching providers, with a focus also on users with disabilities and on access to emergency services.

A summary report of the main outcomes of this Workshop will be discussed at BEREC Plenary 1/2023.

### 2.3.2. Report on measures for ensuring equivalence of access and choice for disabled end-users[33]

The EECC gives Member States an important role in promoting equivalence of access and choice for end-users with disabilities.

The aim of the report is primarily to collate information from national regulatory authorities for the purpose of compiling an inventory of measures and initiatives in place throughout Member States that regulatory authorities might consider when evaluating any action to be pursued under the terms of the relevant legislative provisions. In particular, the report provides information on the way Member States are implementing the measures referred to in Articles 111 and 85.4 of the EECC on the availability and affordability of specific equipment and specific services that enhance equivalent access, including total conversation services and relay services.

The report follows on from three previous reports, published in February 2011, December 2015, and March 2018, broadly on the same subject. The report builds on the answers to an electronic questionnaire issued by BEREC through its constituent national regulatory authorities to gain insight into how the issues of access and choice for disabled end-users are currently addressed across Europe. The responses received from national regulatory authorities to the questionnaire show that at the moment – considering that the new EECC has been nationally transposed only recently and its provisions have been implemented only partially by national regulatory authorities – there is no single way to ensure equivalence of access for end-users with disabilities across all Member States.

The report explores the policy principle and legal background, the implementation of the measures in the EECC, as well as the implementation of other measures under other regulations/national laws, NRAs' competence regarding the protection of end-users with disabilities, the funding mechanism, the concepts of total conversation services and relay services, the engagement with disabled end-users associations and stakeholders, the access to emergency services.

The report was approved for public consultation by the BoR at Plenary 2/2022. The public consultation ran from 15 June to 15 August 2022. The report was approved for publication at Plenary 4/2022.

[33] Title by the WP2022: 'Report on best practices for ensuring equivalence of access and choice for disabled end-users''.

**Document:**

BoR (22) 172: Report on measures for ensuring equivalence of access and choice for disabled end-users

### 2.3.3. Workshop on the digital divide

To contribute to the discussion on the Digital Divide, on 8 June 2022, BEREC hosted a Workshop with NRAs' Heads to exchange views and practices on closing the digital divide. The Workshop was a follow-up of the 'Study on post-COVID measures to close the digital divide'' of October 2021 and of the lessons learned during the COVID-19 pandemics in 2020 and 2021 regarding the digital resilience of networks and digital inclusiveness.

The workshop started with a short video with interviews of a citizen personally affected by the digital divide, an NGO representative, and a municipality official, with the idea of getting their point of view on (i) the way the digital divide affects their lives, (ii) the consequences of the digital divide, and (iii) its solutions. The Workshop continued with a short presentation on the main divides identified by the study and two presentations of speakers from BEUC and from the DG for Employment, Social Affairs, and Inclusion of the European Commission.

Two national experiences presented by CTU and AGCOM offered different perspectives of the digital divides during the COVID-19 pandemic and contributed to animate the discussion that followed on what can NRAs do to promote digital inclusion. In particular, BEREC Heads discussed in a roundtable the social aspects of the digital divide and the main digital challenges on the basis of three discussion questions: (i) how to improve broadband coverage and accelerate network rollout in underserved areas, (2) how to secure affordability of telecom services for disadvantaged groups and (iii) how to promote digital skills and motivation for digitally excluded people and to ensure accessibility of digital services.

**Document:**

BoR (22) 119: Summary Report on the BEREC Workshop on Digital Divide, 8 June 2022

### 2.3.4. Report on Comparison Tools and Accreditation

Article 103(2) of the EECC provides that regulatory authorities shall ensure that end-users have access free of charge to at least one independent comparison tool.

The report offers insights on the independent comparison tools which enable end-users to compare and evaluate different Internet access services and publicly available number-based interpersonal communications services, and, where applicable, publicly available number-independent interpersonal communications services, with regard to prices and tariffs of services and the quality-of-service performance.

The report also captures details of the certification process in each Member State that is, upon request, available to the providers of an independent comparison tool that meet the requirements set out in Article 103(3) of the EECC.

The report explores the policy principle regarding the independent comparison tools and the certification processes, as well as their compliance with the EECC, including the implementation, services and products covered, comparison mechanisms, challenges, costs, and lessons learned.

The report was approved for public consultation by the BoR at Plenary 3/2022. The public consultation ran from 12 October to 30 November 2022. The final report and consultation report will be published after Plenary 1/2023.

## 2.4. Cooperation with EU institutions and institutional groups

### 2.4.1. Implementation of BEREC's Medium-Term Strategy for relations with other institutions and international cooperation

The BEREC strategy 2021-2025 recognises the growing convergence of issues in the field of electronic communications faced worldwide as well as the increasing global nature of electronic communications networks and services. Such trends imply that policies, legislation and regulation must be seen from a more global perspective. As acknowledged by this Strategy, BEREC has benefited since its establishment from the cooperation with NRAs and with other international regulatory networks, policymakers and institutions involved in communications matters based beyond the EU.

This cooperation has been systematised and strengthened in 2021 by means of BEREC's medium-term strategy for international cooperation[34] ('IC MTS'). The IC MTS addresses the need to establish and maintain relationships with external parties related to the execution of BEREC's tasks and evaluates BEREC's international commitments explaining in a detailed and transparent manner what type of cooperation and engagement could be envisaged with each of its international partners. In line with Article 35 of Regulation (EU) 2018/1971, the IC MTS is considered when drafting BEREC international activities in the multi-annual Working Programmes.

In 2022 BEREC initiated all necessary steps to implement the IC MTS, in line with European Union policy and priorities. The International team, set up to support the chair and outgoing chair in maintaining an active relation with the external bodies mentioned in the MTS, developed the first calendar of international events and activities in 2022 relevant for BEREC's work. This calendar has been used as a tool to proactively plan and assign the necessary resources and to implement a series of activities throughout 2022.

The main activities and events with participation of BEREC and its international partners during 2022 are mentioned below.

BEREC intensified cooperation with EaPeReg. A high-level event on future cooperation was organised in Riga on 10 November 2022.

[34] BoR (21) 135, see: https://berec.europa.eu/en/document-categories/berec/berec-strategies-and-work-programmes/berecs-medium-term-strategy-for-international-cooperation-for-the-period-2022-2025

A workshop of BEREC and EMERG was organised in Milan on 11 November 2022 on Broadband connectivity targets.

A successful BEREC-REGULATEL Summit was held in virtual format on 23 June 2022.

An informal BEREC meeting was held on 28 September during the ITU Plenipotentiary Conference (PP-22, 26 September - 14 October 2022, Bucharest). BEREC took part in an ITU training session on 29 September.

The MoU's of BEREC with FCC and CTRC were renewed and signed in June and September, respectively. More focus will be given on exchanges regarding the digital economy.

The BEREC expert working groups have also included many expert exchanges with international organisations and EU agencies relative to their tasks of the work programme in 2022.

**Document:**

BoR (22) 39: BEREC calendar of international activities and events in 2022

BoR (22) 198: BEREC indicative calendar of international activities and events in 2023

## 2.5. BEREC's other tasks

### BEREC ad hoc work

### 2.5.1. Ad hoc input to the EU/NRAs

According to Article 93(8) of Directive 2018/1972 establishing the European Electronic Communications Code (hereinafter: EECC), Member States shall support the harmonisation of specific numbers or numbering ranges within the Union where it promotes both the functioning of the internal market and the development of pan-European services. Where it is necessary to address unmet cross-border or pan-European demand for numbering resources, the Commission shall, taking utmost account of the opinion of BEREC, adopt implementing acts harmonising specific numbers or numbering ranges. Those implementing acts shall be adopted in accordance with the examination procedure referred to in Article 118(4) of the EECC.

In this respect, Article 1 of Commission Decision 2007/116/EC on reserving the national numbering range beginning with '116' for harmonised numbers for harmonised services of social value (hereinafter: Commission Decision) establishes that the numbering range beginning with '116' shall be reserved in national numbering plans for harmonised numbers for harmonised services of social value and the Commission Decision also provides a procedure for reserving national numbers for such services. The Annex to the Commission Decision) contains a list of specific numbers within this numbering range and the services for which each number is reserved. This list may be adapted in accordance with the procedure referred to in Article 93(8) of the EECC.

A harmonised number for harmonised services is a 6-digit number from the numbering range beginning with '116' of each national numbering plan of the EU Member States.

Taking note of the declarations of commitment provided by the majority of Member States, accompanied by declarations by helpline service providers available to provide the service concerned, and in the light of the draft implementing decision prepared by the European Commission, BEREC concluded that it was necessary to issue a positive opinion on the proposal to amend the Annex to the Commission Decision.

**Document:**

BoR (22) 141: BEREC opinion on the Draft Commission implementing decision amending Decision 2007/116/EC as regards the introduction of an additional reserved number beginning with 116 – new helpline for victims of violence against women

### 2.5.2. Update of criterion 4 of the BEREC Guidelines on Very High Capacity Networks

Article 3(2)a of the European Electronic Communications Code (EECC) has the general objective to 'promote connectivity and access to, and take-up of, very high capacity networks'. Article 82 EECC provides that 'BEREC shall, after consulting stakeholders and in close cooperation with the Commission, issue guidelines on the criteria a network has to fulfil in order to be considered a very high capacity network, in particular in terms of down- and uplink bandwidth, resilience, error-related parameters, and latency and its variation.' BEREC approved the BEREC Guidelines on very high capacity networks at Plenary 3 2020[35].

The BEREC Guidelines on very high capacity networks[36] define four criteria and any network that meets at least one of these criteria is considered to be a very high capacity network. Criterion 4 provides that any network providing a wireless connection that is capable of delivering, under usual peak-time conditions, services to end-users with a certain quality of service (performance thresholds 2) is considered to be a very high capacity network. Criterion 4 is based on data collected from mobile network operators on LTE Advanced (4G).

The BEREC Guidelines on very high capacity networks (paragraph 25) state 'since it was not yet possible to take 5G fully into account for the release of these Guidelines, as it has not yet reached mature deployment and significant penetration, BEREC intends to update criterion 4 (performance thresholds for wireless networks) as soon as possible and not later than 2023.' The objective of this project is to update criterion 4 based on data collected from mobile network operators on 5G. The data collection took place from May to June 2022 and, based on the data received from the mobile network operators, criterion 4 of the BEREC Guidelines on very high capacity networks will be updated.

**Document:**

[35] BoR (20) 165, see: https://berec.europa.eu/en/document-categories/berec/regulatory-best-practices/guidelines/berec-guidelines-on-very-high-capacity-networks

[36] See BoR (20) 165, para 18.

| |
|---|
| Adoption of draft guidelines for public consultation at Plenary 1 2023<br><br>Adoption of the final guidelines at Plenary 3 2023 for publication |

### 2.5.3. BEREC Response to the public consultation on the draft revised EC Guidelines on State aid for broadband networks (Carry-over)

BEREC submitted its input regarding the draft revised European Commission (EC) Guidelines on State aid for broadband networks (Draft Guidelines). In its input, BEREC supports the approach adopted by the European Commission (EC), that is to say the improvement of the Guideline in order to reflect technological and market developments to best accompany the necessary investments in the coming years in a manner compatible with the internal market and the achievement of the connectivity objectives for 2030.

*BEREC's main response regarding the Draft Guidelines except Annex I 'Mapping'*

BEREC is of the view that it should be considered to make mandatory the consultation of NRAs in the design of State aid measures (paragraph 113), given the direct link to wholesale access conditions in different frameworks (SMP and Article 61(3) EECC, impact of State aid on the competitive environment). BEREC strongly supports the mandatory requirement to consult the NRAs with respect to wholesale access products, conditions and pricing (paragraph 145). BEREC is of the view that dispute settlement on access products, conditions and pricing regarding State aid is best placed as being mandated to the NRA. In addition, the Member States should ensure that the NRAs are provided with sufficient resources and competences.

BEREC fully supports the connectivity targets set by the EC (e.g. Digital Compass Communications) and is of the opinion that State aid intervention should be clearly regarded as a subsidiary instrument, i.e. where private investments are insufficient to meet end-users' connectivity needs. BEREC considers necessary that the market definition (paragraphs 20 and 35) does not preclude a Member State from the possibility to combine fixed, mobile and backhaul networks in a single State aid scheme. BEREC does not share the view of the EC on the market failure definition. BEREC agrees with the definition of white areas (paragraph 55), and the principle definition of grey areas (paragraph 56), however, BEREC considers that the regime for black areas (paragraph 60) likely results in a severe distortion of competition and the crowding out of private investment, save under very specific circumstances which may arise in the future. BEREC agrees with the step-change foreseen in white areas (paras. 99a, 99b) and sees some issues with regard to the step-change in grey areas and considers it necessary to adapt the definition of grey area slightly.

BEREC is of the view that any State aid scheme should have wholesale access obligations attached to it and considers that all wholesale access products may be required in principle, but the Guidelines should leave NRAs the possibility to adjust the access obligations' portfolio in advance to fit the State aid regime. BEREC welcomes that the pricing principles (paragraph 151) continue the practice of the EC provisions on State aid currently in place, however, it is important that the wording be adapted slightly. BEREC welcomes that environmental aspects

are considered in the Draft Guidelines and that they encourage Member States to include criteria related to environmental impacts in State aid granted projects.

*BEREC's main response regarding Annex I 'Mapping'*

BEREC is of the view that the public authorities should make efficient use of Articles 22, 20 and 21 of the EECC, which provide for surveys of the reach of broadband networks as required for the application of State aid and for the tasks under the EECC. Therefore, BEREC considers that the Draft Guidelines should recognise the purpose of these articles in delivering the information necessary to support State aid notifications. Moreover, BEREC developed Guidelines to support the implementation of Article 22 of the EECC and considers that the data collected following these should be the primary source of information for State aid purposes as, in many cases, it would suffice to assess market failures as described in the Draft Guidelines. The duplication of data requests should be avoided.

Annex I requires that information is provided at address level for fixed and fixed wireless networks and address or small grid level for mobile ones. BEREC argues that alternative options should be allowed, until 21 December 2023, in conformity with the expectations set in the BEREC Guidelines and the EECC. BEREC contends that public authorities should have the authority to design the data requests in a meaningful, proportionate and least burdensome to handle manner. Considering planned deployments, BEREC calls for additional standards that would enable the collection of less granular information.

BEREC concludes that, for legal certainty and technical reasons, the Draft Guidelines should use the 'premises passed'' concept as defined in the BEREC Guidelines and requests that the criteria that characterise peak time conditions in sections 3 and 4 of Annex I be clarified.

**Document:**

BoR (22) 16: BEREC response to the public consultation on the draft revised European Commission Guidelines on State aid for broadband networks

### 2.5.4. BEREC Opinion on the review of the Access Recommendations (Carry-over)

As the Commission did not yet request the BEREC Opinion on the review of the Access Recommendation, the work was carried over to 2023.

### 2.5.5. Peer review process

BEREC and the Radio Spectrum Policy Group (RSPG) agreed working arrangements on 13 June 2019 (see also BoR (19) 100). The arrangements set out cooperation methods for BEREC's participation in the Peer Review Forum. This was done with regard to the requirements of Article 35 of the European Electronic Communications Code (EECC). The cooperation methods are as follows:

- to use the Peer Review Forum as an instrument of peer learning; to promote the view that the Peer Review Forum brings greatest benefit as it convenes national NRAs and

other competent authorities with expertise on comparative or competitive selection procedures pursuant to the electronic communications regulatory framework;

- to cooperate in the implementation of the Peer Review Forum;
- to appoint liaison officers in both BEREC and the RSPG to strengthen the relationship between the two bodies and to facilitate the implementation of this arrangement. The Wireless Network Evolution Co-Chairs are BEREC's liaison officers.

The Peer Review Forum is convened by the RSPG only when required. The responsibilities for adopting and publishing reports on Peer Review are set out in Article 35(7) and (9) of the EECC, and these fall to RSPG to deliver also having regard to the RSPG Rules of Procedure. BEREC experts participated in two Peer Review Forums in the year; Spain (September, 2022) and Hungary (November, 2022).

### 2.5.6. Ad hoc work relating to network security and cybersecurity

BEREC Internal Report on Open RAN – BoR (21) 162 was adopted for internal use in P4 2021. Afterwards it was decided to publish a summary of the Internal Report respecting confidentiality. The document consists of BEREC main findings based on the analysis of the MNOs' responses to the questionnaire and includes indicated possible issues that could be investigated further to establish a greater understanding of the commercialisation path of Open RAN deployments.

| **Document:** |
| --- |
| BoR (22) 23: An overview of the BEREC work on the Open Radio Access Network |

### 2.5.7. Opinion for the evaluation of the application of the Open Internet Regulation

In December 2022, BEREC issued its Opinion for the evaluation of the application of the Open Internet Regulation. With this Opinion, BEREC provided input to the European Commission (EC) for its second report to the European Parliament and the Council on the review of the OIR, due by 30 April 2023. A first report on this matter was issued by the EC on 30 April 2019[37].

The Opinion is based on BEREC's experience gathered over the past four years of applying the OIR and the associated BEREC Open Internet Guidelines[38]. Additionally, BEREC has

[37] To feed into that review, BEREC provided an Opinion to the EC in December 2018, BoR (18) 244, see: https://www.berec.europa.eu/en/document-categories/berec/opinions/berec-opinion-for-the-evaluation-of-the-application-of-regulation-eu-20152120-and-the-berec-net-neutrality-guidelines

[38] BEREC Guidelines on the Implementation of the Open Internet Regulation, BoR (22) 81, see: https://www.berec.europa.eu/en/document-categories/berec/regulatory-best-practices/guidelines/berec-guidelines-on-the-implementation-of-the-open-internet-regulation-0

considered stakeholders' contributions to the public consultations on the draft updated Open Internet Guidelines and on the draft Report on the Internet Ecosystem.

In BEREC's opinion, the OIR works in providing an open internet to stakeholders, safeguarding end-users' rights and guaranteeing the continued functioning of the internet ecosystem as an engine of innovation. BEREC considers that the OIR works and continues to be fit for purpose. Therefore, BEREC sees no merit in changing the text of the OIR.

**Document:**

BoR (22) 163: BEREC Opinion for the evaluation of the application of the Open Internet Regulation

### 2.5.8. BEREC's preliminary assessment on the underlying assumptions of payments from large CAPs to ISPs

In October 2022, BEREC published a preliminary assessment of the underlying assumptions of payments from large content and application providers (CAPs) to internet service providers (ISPs).

This paper sets out a preliminary assessment, in relation to the discussion on the mechanism for 'direct compensation' also referred to as 'fair share' proposed by ETNO members during 2021/2022, which resembles the 'sending party network pays' (SPNP) charging regime. The paper has a limited scope and assesses the grounds for such a proposal and similar approaches, considering market developments that have occurred in recent years and the investments made by the different stakeholders. At this stage, the paper only focuses on the underlying assumptions regarding the need to regulate remunerations of large CAPs to ISPs. BEREC's preliminary assessment is based on several internal workshops with invited speakers, a large number of received written contributions and position papers published by various stakeholders and the previous BEREC work.

Considering the ongoing debate and the foreseen public consultation by the European Commission in the first half of 2023, BEREC will continue to contribute to the debate regarding CAPs' contribution to network investments, to the development of the internet ecosystem and to the achievement of Europe's digital targets for 2030[39].

**Document:**

BoR (22) 137: BEREC preliminary assessment of the underlying assumptions of payments from large CAPs to ISPs

[39] COM(2021) 118 final, see: https://commission.europa.eu/system/files/2023-01/cellar_12e835e2-81af-11eb-9ac9-01aa75ed71a1.0001.02_DOC_1.pdf

## BEREC's mandatory tasks in line with EU legislation

### 2.5.9. Opinion on Article 123

Article 123 of the EECC tasks BEREC with monitoring the market and technological developments regarding the different types of electronic communications and to publish an opinion on such developments and on their impact on the application of the provisions of Title III of Part III of the code by 21 December 2021, and every three years thereafter, or upon a reasoned request from at least two of its Member States. Since no Member State requested such an opinion, BEREC did not produce it.

### 2.5.10. Delegated act(s) concerning emergency communications

Article 109(8) of the EECC stipulates that 'in order to ensure effective access to emergency services through emergency communications to the single European emergency number "112" in the Member States, the Commission shall, after consulting BEREC, adopt delegated acts in accordance with Article 117 supplementing paragraphs 2, 5 and 6 of this Article on the measures necessary to ensure the compatibility, interoperability, quality, reliability and continuity of emergency communications in the Union with regard to caller location information solutions, access for end-users with disabilities and routing to the most appropriate PSAP'. The first such delegated act shall be adopted by 21 December 2022. Those delegated acts shall be adopted without prejudice to, and shall have no impact on, the organisation of emergency services, which remains in the exclusive competence of Member States. BEREC shall maintain a database of E.164 numbers of Member State emergency services to ensure that they are able to contact each other from one Member State to another, if such a database is not maintained by another organisation.

In line with the above provisions, on 5 August 2022 the European Commission (EC) sent the draft Commission Delegated Regulation supplementing Directive (EU) 2018/1972 of the European Parliament and of the Council with measures to ensure effective access to emergency services through emergency communications to the single European emergency number '112' (hereinafter: draft delegated regulation) and the accompanying Staff Working Document to BEREC. BEREC provided its formal opinion on the draft delegated regulation on 14 October 2022.

**Document:**

BoR (22) 142: BEREC Opinion on the draft Commission Delegated Regulation supplementing Directive (EU) 2018/1972 of the European Parliament and of the Council with measures to ensure effective access to emergency services through emergency communications to the single European emergency number '112'

### 2.5.11. International roaming benchmark data report

Under Article 19 of the Roaming Regulation, BEREC must regularly monitor the retail and wholesale roaming prices for voice, SMS and data services, as well as the volume and

revenue generated by mobile operators across Member States. Moreover, following the amendments to Article 19, BEREC must report regularly on the development of pricing and consumption patterns in the Member States for both domestic and roaming services, and on the development of actual wholesale roaming rates for unbalanced traffic between roaming providers. These benchmark data reports are widely acknowledged by the relevant stakeholders and are used by the Commission to review the effectiveness of the Roaming Regulation. BEREC published its 28th benchmark report in March 2022. Following the agreement signed on 4 April 2019, the report contains a report on international roaming in the Western Balkans, attached as an annex.

**Document:**

BoR (22) 22: International Roaming BEREC Benchmark Data Report April 2021-September 2021

### 2.5.12. Intra-EU communications benchmark report

Under Article 5(a)(6) of Regulation (EU) 2015/2120 of the European Parliament and of the Council of 25 November 2015, as amended by Regulation (EU) 2018/1971 of the European Parliament and of the Council of 11 December 2018, NRAs must monitor market and price developments for regulated intra-EU communications and report to the European Commission. In October 2022, BEREC published its third intra-EU communications BEREC Benchmark Report, covering the period April 2021 to March 2022 and including information about intra-EU communication services volumes, revenue and subscribers.

**Document:**

BoR (22) 130: Intra-EU communications BEREC Benchmark Report, April 2021 – March 2022

### 2.5.13. Update of BEREC retail Guidelines on the Roaming Regulation

According to Article 4 (3) and Article 8 (6) of Regulation (EU) 2022/612, BEREC shall update its retail roaming guidelines in close cooperation with the Commission and consult with stakeholders for the purpose of ensuring the consistent application of the provisions.

These revised BEREC Retail Guidelines include the new provisions of the Roaming Regulation, especially with regard to the QoS obligations, the new transparency measures and the new measures concerning valued added services and emergency services. These Guidelines were consulted in summer 2022 and were finally published in December 2022. - The Guidelines replace the BEREC Guidelines published in 2017 (BoR (17) 56).

**Document:**

BoR (22) 174: BEREC Guidelines on Regulation (EU) 2022/612 and Commission Implementing Regulation (EU) 2016/2286 (Retail Roaming Guidelines)

### 2.5.14. Update of BEREC wholesale Guidelines on the Roaming Regulation

These Wholesale Roaming Guidelines replace the BEREC Guidelines of 2017 (BoR (17) 114) which concern the wholesale roaming access obligations for MNOs and the rights for access seekers on the application of Article 3 of Regulation (EU) 531/2012 as amended by Regulation (EU) 2015/2120 and Regulation (EU) 2017/920 (previous Roaming Regulation). The revision of the BEREC Guidelines of 2017 was necessary to include the changes introduced by the new Roaming Regulation (EU) 2022/612 of 6 April 2022 on roaming on public communications networks within the Union (Roaming Regulation), especially the obligations about QoS, emergency communications and value-added services.

The Guidelines were consulted in May/June 2022 and finally published at the beginning of October 2022. These Guidelines are complementary to the BEREC Retail Roaming Guidelines.

**Document:**

BoR (22) 147: BEREC Guidelines on the application of Article 3 of Regulation (EU) 2022/612 of 6 April 2022 on roaming on public communications networks within the Union (Wholesale Roaming Guidelines)

### 2.5.15. VAS, emergency communications and public warning system databases

According to Article 16 of the Roaming Regulation, BEREC was required to establish and maintain a single Union-wide database of numbering ranges for value-added services (hereinafter: VAS database); a single Union-wide database of means of access to emergency services and a single Union-wide database of links to the public warning system applications by 31 December 2022.

Regarding the VAS database, the objective is to protect roaming customers from incurring additional costs when using VAS in visited Member States and to ensure access to emergency services for users while roaming in the EU. Concerning the emergency services database, the main purpose is to be informed of all means of access to emergency services deployed in the Union.

Pursuant to Recital 59 and 60 of the Roaming Regulation, BEREC also established the procedures by which national regulatory authorities and other competent authorities are to provide and update the information in the databases.

**Document:**

BoR (22) 170: Procedures for the BEREC Databases of numbering ranges for value-added services and means of access to emergency services for roaming users

**Monitoring quality, efficiency and sustainability**

### 2.5.16. Assessing BEREC's contribution limiting the digital sector impact on the environment (Carry-over)

In 2021, BEREC included sustainability as an important element of its work programme with special attention to both the internal and external dimensions of BEREC's potential environmental contribution. As a result, BEREC started investigating its own environmental footprint as an organisation, namely the 'internal dimension' through the work of the Expert Networking Group on Sustainability. BEREC also initiated new work streams to deal with the abovementioned aspects of the ICT sector's impact on the environment and develop an understanding of how regulatory actions of NRAs can influence the environmental footprint of assessing the 'external dimension' of BEREC's potential contribution to sustainability.

This report gathers the most interesting outputs of BEREC research on sustainability (e.g. literature review, workshops, interviews, review of NRAs practices) together with the conclusions of the external study, reflected on good practices from the sector and country-specific NRAs' initiatives. BEREC submitted the draft report to a public consultation. The report was adopted by BEREC in June 2022. Beside the abovementioned features, it provides a set of recommended actions for NRAs and for BEREC for their future work on sustainability issues in the digital sector.

**Document:**

BoR (22) 93: BEREC Report on Sustainability: Assessing BEREC's contribution to limiting the impact of the digital sector on the environment

### 2.5.17. BEREC Report on Sustainability indicators for ECNs/ECSs

The previous work done by BEREC highlighted that there is a need to identify the relevant indicators to better characterise the above-mentioned impact. A common measurement methodology across Member States and the possible means to gather information, both from a legal and practical perspective, shall be discussed. BEREC needs to position itself in relation to the Commission's expectations in this area, in particular on the subject of the effective deployment of circular economy and energy efficiency solutions in the lifecycle of broadband networks and electronic communications services. Exploring possible indicators could help public authorities as well as end-users to raise awareness of environmental impact of the ECNs/ECSs. It would empower citizens and Member States alike with data necessary to assess and responsibly choose networks and services of electronic communications.

Hence, BEREC should be ready to take part in the process of identification and definition of indicators and setting a basic framework for the environmental sustainability of ECNs/ECSs. In that sense, this new work stream aims to:

1. Help identify and prioritise the different natures of impact (GHG emissions, water consumption, waste) of digital technologies, with a focus on ECNs/ECSs.

2. For each nature of impact, to develop the group's understanding of the main drivers of the digital environmental footprint and corresponding indicators that could improve the monitoring of these evolutions as well as the transparency of environmental information intended for consumers.

3. Feed BEREC's future positions regarding ECNs environmental footprint assessment, indicators and transparency of this information towards end-users, promote the sharing of best practices on indicators among public authorities and with the sector and reflect on means to favour common approaches and harmonisation of standards and methodologies.

To deepen its expertise, BEREC engaged in 2022 with other relevant players regarding the sustainability of ECNs and indicators to measure it. It opened a call for input from relevant stakeholders (operators, service providers, end-user associations, environmental organisations, etc.) to identify which indicators they deem feasible and useful for the purposes of evaluating the environmental impact of ECNs/ECSs and setting an assessment methodology. A set of technical workshops was organised complementing a questionnaire on existing indicators design that was sent to relevant partner organisations and other stakeholders from the sector. In 2023, the results of stakeholders' inputs and the group's analysis of the issue will be presented in a report that could then be used for BEREC's future work and opinions.

**Document:**

BEREC Report on Sustainability: Sustainability Indicators for Electronic Communications Networks and Services To be approved in 2023.

### 2.5.18. Study on NRAs' institutional features and relevant BEREC evaluations

The European Electronic Communications Code (EECC) provides NRAs with a common minimum set of competences and reaffirms the importance that the NRAs are provided with sufficient resources, competences and operational requirements and conditions concerning independence as a means of ensuring their effective functioning in pursuing the relevant regulatory objectives. The Commission's proposal was built on the experience gained from three decades of telecoms regulation in Europe as a competitive industry.

In 2020, BEREC issued a public statement (BoR (20) 141) recalling a previous declaration of 2012 and pointing to the importance of actively monitoring any developments in the domain of NRAs' independence, and the need for firm action whenever concerns arose about the weakening of the institutional arrangements needed for the correct application of the regulatory framework.

In its 2020 statement, BEREC called on the Commission to continue, as guardian of the Treaties, to proactively guard against any action and/or omission that undermines the ability of independent NRAs to perform their regulatory tasks effectively. Any interference in the efficient execution of the NRAs' tasks through the erosion of their powers, competences or resources threatens the effective functioning of national markets and ultimately the single

market, furthermore, weakening the BEREC's stance in promoting the consistent application of the regulatory framework throughout the EU.

In June 2021 BEREC renewed its commitment to support the NRAs' independence in practice by envisaging an in-depth analysis of the NRAs' institutional features to be included in the BEREC WP 2022. In fact, as a follow-up to the full entry into force of the ECCC, BEREC deemed it appropriate to develop a factual overview of the independence features that have been granted to each National Regulatory Authority under the EECC, to identify the concrete daily functioning of the EECC legal provisions.

Hence, at the beginning of 2022, BEREC appointed an external consultant in charge of drafting a study on the independence of the NRAs, starting in March 2022. The study provides a reasoned recollection of the relevant theoretical research on NRAs' independence, analyses the relevant legal provisions (*de jure* independence) and unveil facts on how the NRAs' independence is practised (defacto independence). The results are based on data collection, relevant literature review, focus interviews and surveys with the relevant actors.

The report focuses on three broad categories: operational, financial and personnel. The dimension of systemic independence has been added to reveal the foundation of NRA independence. Accountability and monitoring have also been included, enabling verification of actions taken by NRAs. Finally, a dimension relevant to future challenges for NRA independence has been analysed.

The study prepared for the Body of European Regulators for Electronic Communications (BEREC) reflects the views only of the authors. Based upon the factual findings stemming from the study, BEREC is planning to elaborate some evaluations on the relevant matters highlighted in this report during 2023.

**Document:**

BoR (22) 189: Study on NRA Independence by Ecorys – Final report

### 2.5.19. Article 32/33 Phase II process

On 31 March 2021, the Commission adopted Recommendation (EU) 2021/554 (the 'Procedural Recommendation') on the form, content, time limits and level of detail to be given in notifications under the procedures set in Article 32 of the EECC. In 2022, BEREC successfully updated the Internal Guidelines for the elaboration of BEREC Opinions in Article 32 and 33 Phase II cases, taking into account the EECC, the Procedural Recommendation and experience learnt from conducting Phase II cases. BEREC will continue to add new Phase II cases to a database, will analyse and monitor the Phase II cases process, and exchange information with the BEREC Office about the effectiveness of the updated Internal Guidelines.

**Document:**

BoR (22) 140: BEREC Updated BEREC's internal Guidelines for the elaboration of opinions in Article 32 and 33 EECC Phase II cases

### 2.5.20. Internal workshop on relevance of maintaining BEREC Common Positions on best practice remedies (WLA, WBA, WLL)

BEREC was planning to access in 2022 the relevance of maintaining BEREC Common Positions on best practice remedies (WLA, WBA, WLL), since from 2012 significant changes came and influenced both the legal and the market environment (the EECC (in 2018), new Relevant Markets Recommendation (in 2020), new Access Recommendation (in 2013), several BEREC Guidelines etc.). However this work stream had to be moved to 2023, because of delays in reviewing the 2010 NGA and the 2013 NDCM Recommendations into a new Access Recommendation.

### 2.5.21. Report on Regulatory Accounting in Practice

The Regulatory Accounting (RA) annual report gives an overview of the main remedies imposed on SMP operators in relevant markets susceptible to ex-ante regulation. Specific focus is given to the relevant costing methodologies, applied in relation to the corresponding price control schemes, adopted by NRAs for single products.

This is the eighteenth RA annual report, which summarises the findings of a detailed survey of regulatory accounting systems in the regulatory context in access markets across Europe. Information has been gathered from National Regulatory Authorities (NRAs) and covers the implementation of regulatory cost accounting methodologies in the national market situations. It includes the state of play in terms of remedies of market regulation and focuses on price control, and the way in which it is defined in practice. The report provides also (i) elements about the structural parameters of each country, (ii) WACC methodologies applied by NRAs and WACC values currently in force focusing on the implementation of the corresponding European Commission WACC Notice on the calculation of the cost of capital for legacy infrastructure.

The document offers an up-to-date factual report on the regulatory accounting frameworks implemented by NRAs and an assessment of the level of consistency achieved. Where possible, trends and comparisons with data collected in the past years are illustrated.

The report focuses on the analysis of services in key wholesale markets: Wholesale Local Access (former Market 3a/2014, now market 1/2020), Wholesale Central Access (Market 3b/2014) and Wholesale high quality access (former Market 4/2014, now market 2/2020).

In line with the previous reports it also provides information about the regulatory and competitive framework in each Member State, such as the presence of a geographical regulation, the equivalence model applied, the application of retail margin squeeze test, and the cable regulation. A brief analysis of symmetric remedies is included. Outcomes of the survey are simply reported in a descriptive form.

The report also looks at annualisation methodologies provided by respondent NRAs. As in last year's report, accounting information for specific products in Market 3a/2014, such as copper

access (including LLU, SA, SLU), fibre access (FLLU, VULA), dark fibre access and duct access have been further analysed.

An evaluation of the implementation of the Recommendation 2013/466/EU on consistent non-discrimination obligations and costing methodologies is presented.

Furthermore, as in last year's report, in order to include factors influencing NRAs regulatory strategy, additional structural data (e.g. population, market and competitive structure, infrastructure) have been collected from NRAs.

In Chapter 5, the report delivers an extended survey on WACC parameters, mainly focusing on market 3a/2014. The WACC chapter summarises the main methodologies currently used by NRAs and sets out the reasons behind the estimation of single parameters needed to evaluate the cost of capital under the CAP-M model.

Appendix I contains a number of figures/tables providing further details on some of the analyses in the report.

As can be seen from the results above, the Report confirms a trend towards a consistent application of regulatory accounting frameworks by NRAs. This also reflects clearly convergence in the application of the 2013 Recommendation on consistent non-discrimination obligations and costing methodologies. In 2023 the report will continue to look at the application of regulatory accounting with respect to key access products (e.g. fibre) and will maintain an in-depth analysis of the methods as well as the national market situations in which they are applied. Further to this, the focus of the report will be adapted in the light of the EECC provisions given that the EECC were to be transposed by Member States by 21 December 2020. This implies looking at in which way NRAs apply the updated provisions to deal adequately with the developments in markets and technology.

Regarding the WACC calculation, the report data will continue to be collected based on the methodology and input parameters actually used by NRAs to estimate the rate of return on capital employed, and the impact of both on the result will be considered. Furthermore, the convergence of WACC calculations through the application of the Commission WACC Notice will be followed.

**Document:**

BoR (22) 164: BEREC Report on Regulatory Accounting in Practice 2022

### 2.5.22. Weighted Average Cost of Capital (WACC) parameters' calculation according to the European Commission Notice

In this third BEREC Weighted Average Cost of Capital (WACC) parameters Report, BEREC calculates the WACC parameters following the Commission's non-binding WACC Notice on the calculation of the cost of capital for legacy infrastructure in the context of the Commission's review of national notifications in the EU electronic communications sector of 6 November 2019[40]. The cost of capital is the core element of any regulatory pricing decision NRAs take.

[40] See: https://digital-strategy.ec.europa.eu/en/library/commission-publishes-notice-calculation-cost-capital-legacy-infrastructure

The Notice aims to ensure a consistent calculation of the WACC by national regulatory authorities (NRAs) thereby contributing to the development of the internal electronic communications market.

As the Commission's Notice has not changed, BEREC is following the same methodology (incl. 'technical choices') as in last year's Report, providing utmost continuity.

BEREC applied three general principles:

- Follow the Notice as closely as possible; this mainly refers to the methodologies to be used for the estimations;
- Be transparent, using publicly available data where possible or using data which are widely used and accepted in the financial markets; this refers to the data sources to be used for the estimations;
- Explain every step of the calculation and proceed in a straightforward manner; this refers to the calculations per se.

For each of the parameters of the WACC formula (using the Capital Asset Pricing Model (CAPM) approach) the Report sets out:

- the application of the methodologies according to the WACC Notice,
- the assumptions and choices made,
- the data and data sources used,
- the steps of the calculations,
- the results.

By explaining precisely and transparently how the results were derived, NRAs will be able to follow the BEREC calculation steps from start to end and to fully understand the logic of the calculation process so that they can replicate the results shown in the WACC parameters Report. This ensures that NRAs are confident that the results are robust and were derived using state of the art professional standards as well as following the Notice as closely as possible, taking into account also best regulatory practices where the Notice provides for NRAs' flexibility.

All results were cross-checked and verified to ensure that no methodological mistakes have been made, no questionable data have been used and no calculation errors have occurred, so that BEREC was able to exclude any systematic bias. Only after these checks were carried out was BEREC satisfied that the results were correct and NRAs will be confident to use them in their own WACC calculations.

The following table provides a summary of the structure of the WACC parameters Report, BEREC's calculations and (references to) the results derived from it.

*Table 1. Summary of the structure of the BEREC WACC parameters Report 2022 with references to results tables*

| Chapter | Parameter | Results | Reference (Table) |
|---|---|---|---|
| Chapter 1 | Introduction<br>WACC formula | | |
| Chapter 2 | RFR | RFR for each EU member state | Table 2 |
| Chapter 3 | Peer group | BEREC Peer Group 2022 comprising 15 companies | Table 3 |
| Chapter 4 | Debt premium,<br>Cost of debt | Debt premium, Cost of debt for each of the 15 companies of the BEREC Peer Group | Table 4 |
| Chapter 5 | Equity beta,<br>Gearing,<br>Asset beta | Equity beta, Gearing, Asset beta for each of the 15 companies of the BEREC Peer Group | Table 6 |
| Chapter 6 | ERP | EU-wide ERP | Table 10 + 11 |
| Chapter 7 | Summary | All WACC parameters as calculated by BEREC | Table 12 + 10 |

The novelty of the Notice and the WACC parameters Report is the calculation of an EU-wide ERP (equity risk premium). Based on the calculations described in Chapter 6 BEREC considers that the appropriate value of the single EU-wide ERP is **5.70% (AM).** As the same methodology as last year was used, the increase from 5.50% (AM 2021) to 5.70% (AM) in 2022 is attributable to factual developments, i.e. the increased value is attributable only to the last year upgrade of the premium that is the seventh most relevant increase of the Equity premium over bond since 1900 and the second most relevant increase since the sixties of the previous century.

Since 2021, BEREC estimates additionally a separate EU/EEA-ERP for exclusive use by Nkom (Norway), ECOI (Iceland) and AK (Liechtenstein)[41].

The BEREC peer group comprises now 15 peers, as DIGI Communications N.V. was included for the first time.

[41] As no data are available for Liechtenstein, the separately estimated EU/EEA-ERP includes only data for Norway and Iceland.

BEREC publishes the estimated WACC parameter values and NRAs are assumed to take into account those parameter values when carrying out their own calculations for their national regulatory decisions, but they do have some flexibility within this framework to take account of national specificities. For reference by NRAs, the Report is to be published before 1 July 2022 when the Commission applies it according to the Notice when reviewing NRA's notifications in the EU electronic communications sector.

BEREC has taken utmost care to develop this report according to the best knowledge and technical expertise of its members. Nevertheless improvements may be necessary in the future yearly update where deemed appropriate.

**Document:**

BoR (22) 70: BEREC WACC parameters Report 2022

### 2.5.23. Report on the monitoring of the termination rates for mobile and fixed voice calls

This BEREC Report reflects on the requirements of Article 75 (3) EECC, which states that NRAs shall annually report to the EC and BEREC with regard to the implementation of the Delegated Regulation (EU) 2021/654 setting a single maximum Union-wide voice termination rate and a single maximum Union-wide fixed voice termination rate ('DR').

The Report, delivered in close collaboration with the EC, establishes a template for the NRAs' annual reporting obligation, so that the reporting is harmonised. The template includes questions regarding the monitoring practices of the NRAs, the compliance with the DR for calls originated form Union-numbers and from third country-numbers, as well as about auxiliary services and the misuse and/or fraudulent use of the calling line identification (CLI). It also enquires about disputes raised with the NRAs in the EU Member States (MS) or any other issues related to the application of the DR which might have occurred during the reporting period.

In order to perform this task, BEREC collected relevant information from NRAs and was made aware that, during the second half of 2021, in the first 6 months of the Regulation's application, there had been no substantive issues identified.

For transparency and accountability reasons, after the completion of the NRAs' yearly reporting to BEREC and the EC, BEREC will publish a new report summarising the main findings and its conclusions.

**Document:**

BoR (22) 73: BEREC Report on the monitoring of the termination rates for mobile and fixed voice calls

### 2.5.24. Report on number-independent interpersonal communication services (NI-ICS) revenue indicators[42]

As a follow-up to BoR (21) 127[43], this report deals with revenue metrics and, separately, reflects on the possibilities that BEREC has to maintain a NI-ICS providers' contact list that could be used by NRAs whenever they need to reach out to fulfil their duties, under the EECC and related regulations.

Its first part considers the business models of NI-ICS providers and argues for the need of revenue indicators to fulfil NRAs' regulatory mandates. Given the complexity of the business models of the NI-ICS providers, BEREC considers the relevance of the NI-ICS to the overall platform/provider's revenues to propose a revenue typology. Then, BEREC discusses the importance of each revenue category for the different tasks an NRA may be engaged in, drawing a correspondence between the main missions envisaged and the particular types of revenues which would be informative in that context.

In order to deliver this part, on 29 June 2022, BEREC held a workshop with stakeholders to discuss its preliminary assessment of the need for revenue information and the revenue taxonomy. The overall conclusion of the workshop pointed to diverging views in the industry, where some of the traditional operators were supportive of the idea of non-discrimination in terms of data collection between NI-ICS and NB-ICS, pointing at the reasons for which data should be collected from NI-ICS, while NI-ICS providers questioned the need for revenue information, stressing their lighter regulatory regime under the EECC.

Finally, the report also studies the legal possibilities that BEREC has to host a NI-ICS providers' contact list, which could be used by NRAs whenever they need to reach out to those providers for the fulfilment of their duties. Two options are presented: one in which the NI-ICS providers share voluntarily their contact details with BEREC, and another in which it is the NRAs that share with BEREC the contact details of the NI-ICS providers that they have. The report only provides preliminary considerations regarding such possibilities, to enable BEREC's judgement on the matter and, if deemed adequate, for future development.

**Document:**

BoR (22) 183: Report on number-independent interpersonal communications services (NI-ICS) revenue indicators

[42] Title by the WP2022: 'Report on the business and revenue models of NI-ICS and update on NRAs data collection practices on NI-ICS''

[43] BEREC Report on harmonised definitions for indicators regarding over-the-top services, relevant to the electronic communications markets: https://www.berec.europa.eu/en/document-categories/berec/reports/berec-report-on-harmonised-definitions-for-indicators-regarding-over-the-top-services-relevant-to-electronic-communications-markets

## 2.6. Stakeholder engagement

### 2.6.1. Stakeholder Forum

On 23 March 2022, BEREC held its annual Stakeholder Forum in Brussels, Belgium, focusing on topics relevant to the telecommunications market. The event kicked off with the 'Meet & Greet' sessions between the stakeholders and the BEREC Working Groups' Co-chairs. It was followed by the conference and concluded with the networking reception. The 'Meet & Greet' sessions, already successfully introduced for the past 2 years, are informal meetings providing the registered stakeholders with the opportunity to exchange ideas and discuss the sector's challenges. During the conference, the incoming BEREC Chair, Prof. Konstantinos Masselos (EETT, Greece), presented the draft BEREC Work Programme 2023. Together with the BEREC Chair, Annemarie Sipkes (ACM, The Netherlands), they engaged with the participants in discussing the current and future challenges in BEREC's work. Roberto Viola (DG CNECT) presented Europe's Digital Decade Policy Programme, which was followed by a Q&A session. The first Panel of the conference was devoted to recent advances and regulatory challenges regarding Artificial Intelligence, while the second one focused on the Digital Platforms Regulation and the way towards the Effective Enforcement of the Digital Markets Act. A presentation of 'BEREC's Study on Evaluation and Impact Assessment of the Effect of Electronic Communications on the Environment' was also made. Both in-person and online participants had the opportunity to follow the discussions, setting questions throughout the event. The incoming BEREC Chair, Prof. Konstantinos Masselos, assisted by the event's moderator, Philippe Defraigne (Cullen International), gave the closing remarks.

### 2.6.2. BEREC Annual Report

The Annual Report on developments in the electronic communications sector in 2021 had a foreword by Mr Michel Van Bellinghen (BIPT, Belgium), BEREC Chair 2021, who noted that the BEREC Work Programme 2021 emphasised the promotion of full connectivity in Europe, the importance of BEREC being acknowledged as a key partner for the EU institutions with respect to European digital policy and the cultivation and continuous improvement of BEREC for the benefit of Europe and its citizens.

BEREC's activities in 2021 were underpinned by three pivotal pillars of the newly adopted Strategy 2021-2025. In executing our Work Programme, there was a particular emphasis on three aspects: the first – to promote full connectivity and, by doing so, incentivise investments and leadership in Europe in 5G and fibre across the communications sector. The second – to make sure that BEREC is widely acknowledged as a trustworthy partner for the EU institutions in the context of the European digital policy. The third – to upskill the organisation, making Europe fit for the digital age and the related challenges of technological evolution, for the benefit of Europe and its citizens.

It was stated that the 2021 results demonstrated BEREC's ability to deliver on its unwavering commitment to achieving its Strategy 2021-2025, guided by a consistent application of the regulatory framework in electronic communications, as well as its role as an independent advisory body for the co-legislators. The output in Reports, Opinions and Guidelines in 2021 on a broad range of topics in the field of electronic communications confirmed the success of

BEREC's structure, showing the dedication, knowledge and competence of the Working Group Co-Chairs and experts drawn from all NRAs, who strove to achieve the best outcomes, and the commitment of the Contact Network members and members of the Board of Regulators. Moreover, the good working relationship with the BEREC Office was a core value of the cooperation.

**Document:**

BoR (22) 78: BEREC Annual Reports 2021

### 2.6.3. BEREC Communications Plan 2022

The BEREC Communications Plan 2022 included the communications activities and projects planned for the year. The objective was to strengthen the perception of BEREC as an independent, European, forward-looking expert body and support the overall strategic objectives of BEREC – including promoting full connectivity, supporting sustainable and open digital markets, and empowering end-users. This plan complemented the BEREC External Communications Strategy, which sets out BEREC's overall approach to communications. The main activities of the year 2022 included the creation of interactive BEREC website design templates, an essential part of the new BEREC website design. BEREC updated the BEREC and the BEREC Office visual identity, including the logos. To personalise BEREC and its work, a series of video clips was produced about the BEREC Working Groups.

Within the day-to-day communications activities, BEREC continued organising regular BEREC public events, such as public debriefings and the Stakeholder Forum, published press releases and news items, produced audio-visual and digital content, ran social media campaigns, and kept up media relations.

### 2.6.4. Developing the BEREC Work Programme 2023

The BEREC Work Programme 2023 was adopted in December 2022, setting out the priority work areas that the Board of Regulators had identified for 2023. These areas may be complemented by other emerging topics of interest during the year. The objectives of the Work Programme are fully aligned with the BEREC 2021–2025 Strategy, with a close focus on the three high-level priorities (promoting full connectivity, supporting sustainable and open digital markets and empowering end-users) and the priorities set for institutional and international cooperation. In 2023, BEREC is set to support the further implementation of the European Electronic Communications Code (EECC) at national level and start taking stock of the national implementation status throughout the Union.

Promoting full connectivity for consumers and businesses remains a key priority for BEREC in 2023. In line with the European ambition to create a Europe fit for the digital age, BEREC will contribute by facilitating the roll-out of Very High Capacity Networks (VHCNs) and stimulating their contribution to closing the digital divide. Through cooperation with other competent authorities and stakeholders, BEREC will also help ensuring that future network technologies meet their connectivity targets in line with European values and societal needs such as cybersecurity, safety and environmental challenges.

In 2023, BEREC will continue to analyse technological developments and their impact on sustainable competition on telecom markets. Closing the digital divide entails more than just the roll-out of VHCNs. It also requires end-users to have access that fits their needs. BEREC will empower end users by further enhancing transparency and will work on defining an adequate broadband Internet access service and giving guidance about Quality of Service parameters.

Open and sustainable European digital markets are a cornerstone of a Europe fit for the digital age. In line with both BEREC's strategic priority to support sustainable and open digital markets and the role that BEREC will play within the European High-Level Group of Digital Regulators for the enforcement of the Digital Markets Act, BEREC will keep monitoring and analysing developments on the digital markets and the impact and effects of the practices implemented by large online platforms.

**Document:**

BoR (22) 193: BEREC Work Programme 2023

# Annex 1 – Meetings with the European institutions and other European Union bodies

A. Meetings with the European Commission

| Dates/place | Event |
|---|---|
| 4 February 2022, Virtual meeting | Meeting with DC CONNECT |
| 7 March 2022, Virtual meeting | Meeting with DC CONNECT |
| 31 March 2022, Virtual meeting | Meeting with DC CONNECT |
| 31 May 2022, Virtual meeting | Meeting with DC CONNECT |
| 28 September 2022, Virtual meeting | Meeting with DC CONNECT |
| 2 December 2022, Virtual meeting | Meeting with DC CONNECT |

B. Meetings with the European Parliament/European Council

| Dates/place | Event |
|---|---|
| 25 May 2022, Virtual meeting | EESC Hearing on Emergency preparedness: security of supply |
| 31 August 2022, Virtual meeting | Meeting on the BEREC High Level Opinion on the draft Data Act with MEP Garcia del Blanco |
| 5 December 2022, Brussels, Belgium | BEREC Chair 2022 attendance at European Parliament ITRE meeting |

C. Meetings and workshops with other EU bodies

| Dates/place | Event |
|---|---|
| 6 May 2022, Athens, Greece | Meeting with the Executive Director of ENISA, Juhan Lepassaar |
| 20 June 2022, Virtual meeting | Meeting with the ERGA Chair 2022 Karim Ibourki |

# Annex 2 – Public debriefings and BEREC engagement with stakeholders

| Dates/place | Event |
|---|---|
| 19 January 2022, Virtual meeting | BEREC Workshop – CMA presentation @ BEREC on mobile ecosystems |
| 8 February 2022, Virtual meeting | Workshop on Sustainability |
| 16 March 2022, Virtual meeting | Public debriefing on the outcomes of the 50th BEREC ordinary meetings |
| 23 March 2022, Belgium, Brussels | BEREC Stakeholder Forum |
| 4 April 2022, Virtual meeting | BEREC Stakeholder Workshop on ICT Sustainability |
| 24 May 2022, Virtual meeting | BEREC Workshop on Open RAN |
| 15 June 2022, Belgium, Brussels | Public debriefing on the outcomes of the 51st BEREC ordinary meetings |
| 29 June 2022, Virtual meeting | Workshop regarding BEREC's Report on NI-ICS indicators |
| 15 September 2022, Belgium, Brussels | BEREC Workshop – experience sharing on the implementation of Article 22 EECC – Geographical surveys of network deployments |
| 12 October 2022, Belgium, Brussels | Public debriefing on the outcomes of the 52nd BEREC ordinary meetings |
| 14 December 2022, Belgium, Brussels | Public debriefing on the outcomes of the 53rd BEREC ordinary meetings |

# Annex 3 – International events[44]

| Dates/place | Event |
|---|---|
| 25 January 2022, Virtual meeting | The European 5G Conference |
| 26 January 2022, Virtual meeting | CERRE discussion 'Guidelines on State aid for broadband network' |
| 27 February 2022, Barcelona, Spain | GSMA-EIF roundtable (GSMA Mobile World Congress) |
| 28 February 2022, Barcelona, Spain | BEREC-GSMA Ministerial roundtable (GSMA Mobile World Congress) |
| 1 March 2022, Barcelona, Spain | GSMA Ministerial Programme, session 'Ask the Regulator: COVID Learnings, New Approaches' (GSMA Mobile World Congress) |
| 8 March 2022, Paris/Nevers, France | Informal Meeting of Ministers in Charge of Telecommunications |
| 21 March 2022, Virtual meeting | ETNO/ French Presidency of the Council of the EU event 'EU Digital Decade: From Targets to Enforcement' |

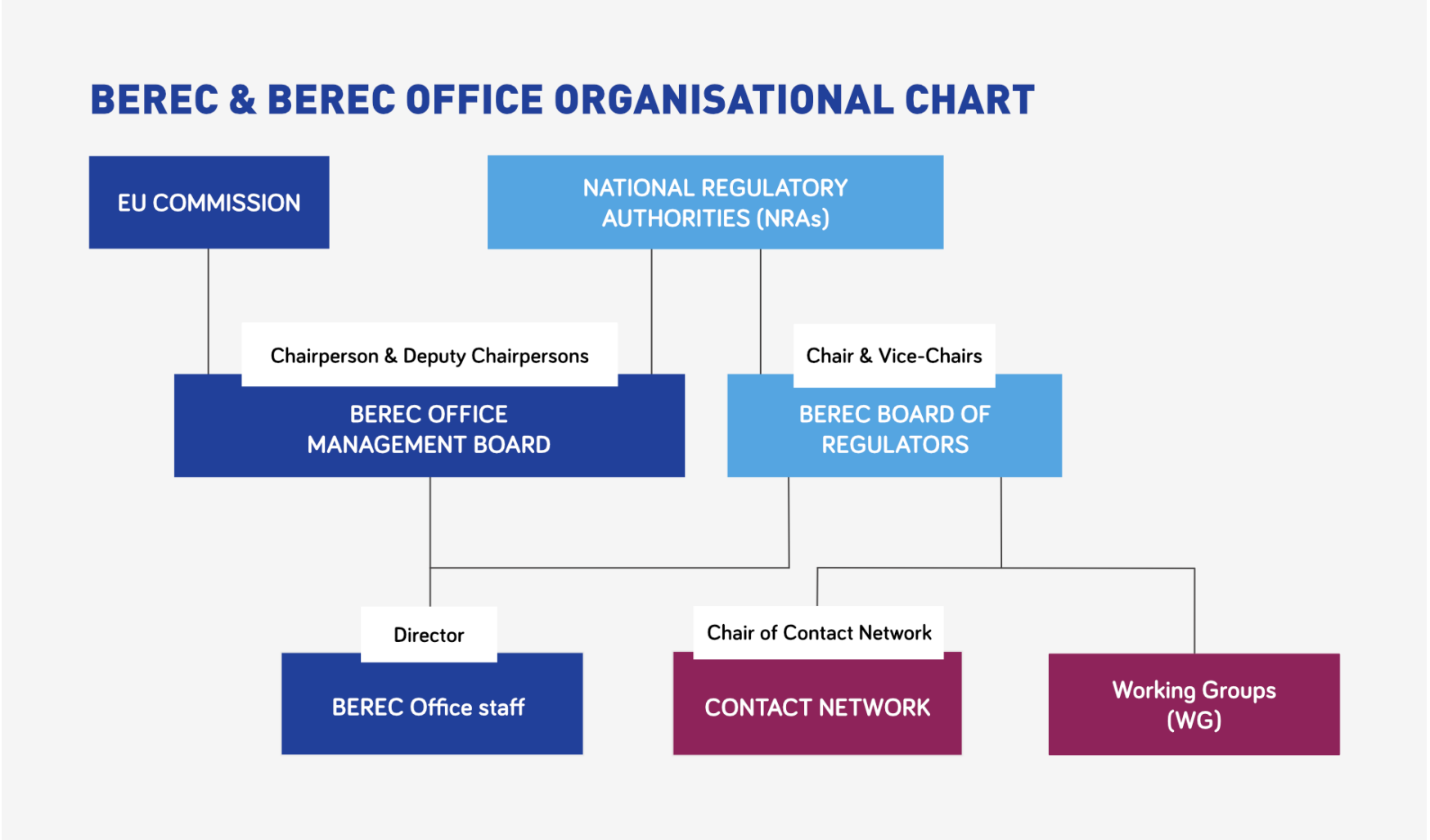
[44] More information: https://berec.europa.eu/en/berec/external-meetings-of-the-berec-chair-2022

| | |
|---|---|
| 30 March 2022, Virtual meeting | Telecommunications & Media Forum (TMF)<br>Panel on Europe's Digital Decade – 'Spending and investing for the future. How will Green and Digital targets be achieved in parallel?' |
| 7 April 2022, Virtual meeting | The18th Meeting of the OECD Network of Economic Regulators. Session 'Agile Regulatory Governance to Harness Innovation' |
| 22 April 2022, Virtual meeting | 12th CPLP Communications Forum, Panel on Cybersecurity – Public and regulatory policies |
| 26 April 2022, Brussels, Belgium | FWA (Fixed Wireless Access) – IDATE DigiWorld event |
| 6 May 2022, Athens, Greece | ENISA conference: THREATHUNT 2030, Panel: Foresight as a strategic priority for cybersecurity |
| 16 May 2022, Brussels, Belgium | ETNO conference 'Europe's Internet Ecosystem: Is Everybody Contributing Their Fair Share?' |
| 18 May 2022, Brussels, Belgium | GSMA event 'The Internet Value Chain: latest numbers, current dynamics, and future trends' |
| 19 May 2022, Virtual meeting | Forum Europe webinar: 'Releasing the potential of Fixed Wireless Access in Europe' |
| 19-20 May 2022, Brussels, Belgium | 15th Seminar for National Judges: Contribution of the Electronic Communications Regulation to EU's Digital Future |
| 23-25 May 2022, Vienna, Austria | FTTH Conference 2022 |
| 24 May 2022, Virtual meeting | 6GSymposium Spring 2022. Panel: The Problem of Universal Access: Who Needs to Act? |
| 24 May 2022, Virtual meeting | 6GSymposium Spring 2022. Panel: Why do we need a regulation evolution? |
| 25 May 2022, Virtual meeting | EESC Hearing on Emergency preparedness: security of supply |
| 1June 2022, Virtual meeting | IRG Global Gateway Webinar |
| 1June 2022, Geneva, Switzerland | ITU World Summit on the Information Society Forum 2022<br>High-level policy session: 'Climate change and bridging digital divides' |
| 13 June 2022, Brussels, Belgium | OVH Cloud event. High-level panel discussion on Digital & Environment |
| 13 June 2022, Brussels, Belgium | Bilateral meeting with CCIA |
| 14 June 2022, Virtual meeting | EURACTIV Virtual Conference 'Green ICT – How can the digital sector accelerate the green transition?' |
| 15 June 2022, Brussels, Belgium | Bilateral meeting with ECTA |
| 15 June 2022, Brussels, Belgium | GSMA Summer Reception |
| 16 June 2022, Virtual meeting | EaPeReg Plenary meeting |
| 21 June 2022, Virtual meeting | IIC webinar: Enforcement challenges in Digital Markets' regulation |
| 21-22 June 2022, Toulouse, France | Digital Assembly 2022 |
| 23 June 2022, Virtual meeting | BEREC-Regulatel summit |

| | |
|---|---|
| 27-28 June 2022, Stockholm, Sweden | Ericsson PTS conference ‘Broadband for all’ |
| 27 June 2022, Stockholm, Sweden | Bilateral meeting with Telecom Regulatory Authority of India (TRAI) |
| 27 June 2022, Stockholm, Sweden | Bilateral meeting with Ministry of Internal Affairs and Communications of Japan |
| 27 June 2022, Stockholm, Sweden | Bilateral meeting with Malaysian Communications and Multimedia Commission |
| 27 June 2022, Stockholm, Sweden | Singing MoU with Canadian Radio-television and Telecommunications Commission (CRTC) |
| 29 June 2022, Brussels, Belgium | DigiWorld Institute event: Greening of digital/networks and the circular economy |
| 5 September 2022, Brussels, Belgium | Meeting with Microsoft |
| 5 September 2022, Brussels, Belgium | Meeting with CCIA |
| 5 September 2022, Brussels, Belgium | Meeting with Google |
| 6 September 2022, Brussels, Belgium | Meeting with Meta |
| 6-7 September 2022, Brussels, Belgium | WIK conference 2022 ‘New rules for the Digital Decade’ |
| 12 September 2022, Washington, D.C., USA | Singing MoU with the United States Federal Communications Commission (FCC) |
| 12-16 September 2022, Washington, D.C. and Boston, MA, USA | Study trip |
| 26 September 2022, Brussels, Belgium | Financial Times Tech & Politics Forum |
| 26 September 2022, Brussels, Belgium | Meeting with Commissioner Brendan Carr, FCC |
| 27 September 2022, Brussels, Belgium | High-Level Roundtable on Telco Investment and Digital Decade 2030 |
| 18-20 October 2022, Amsterdam, the Netherlands | NetworkX Conference |
| 19 October 2022, Brussels, Belgium | Meeting with Sky |
| 25 October 2022, Brussels, Belgium | ETNO workshop ‘Study on the impact of the Data Act proposal on European telecom operators’ offerings’ |
| 1-2November 2022, Ottawa, Canada | IICOM International Regulators’ Forum |
| 3-4 November 2022, Ottawa, Canada | IICOM Annual Conference 2022 |
| 3-4 November 2022, Prague, Czech Republic | High-level ministerial conference EU Secure and Innovative Digital Future |
| 10 November 2022, Riga, Latvia | EaPeReg – BEREC summit on future perspectives of cooperation |
| 21 November 2022, Amsterdam, the Netherlands | W@CompetitionNL 'Competition Compliance: a Future-Proof Policy' |
| 29-30 November 2022, Riga, Latvia | 5G Techritory |
| 30 November 2022, Brussels, Belgium | Meeting with the representatives of the Korean Mission to the EU |
| 5 December 2022, Brussels, Belgium | GSMA Winter reception |

| | |
|---|---|
| 07 December 2022, Prague, Czech Republic | EaPeReg Plenary meeting |
| 14-15 December 2022, Peru | REGULATEL Plenary Assembly |
| 13-14 December 2022, Gran Canaria | OECD Digital Economy Ministerial Meeting |
| 13-14 December 2022, Gran Canaria | Bilateral meetings with MPA, Meta, Amazon Web Services |
| 14 December 2022, Virtual meeting | CCIA roundtable ‘Network usage fees: What's next?’ |

## Annex 4 – BEREC and BEREC Office organisational structure



The work of BEREC is organised into Working Groups (WGs), which work on specific topics that are included in the BEREC Work Programme or that arise on an *ad hoc* basis, following requests for advice or opinions from the EU Institutions. The WGs are led by two Co-Chairs from different NRAs and include their respective experts.

# Annex 5 – BEREC Members and Observers of the Board of Regulators by end 2022

List of the members and observers of the Board of Regulators established pursuant to Article 7(1) of Regulation (EU) 2018/1971 of the European Parliament and of the Council of 11 December 2018 establishing the Body of European Regulators for Electronic Communications (BEREC) and the Agency for Support for BEREC (BEREC Office)[45]

| No | Country (if applicable) | Title | Name(s) | Surname(s) | Name of organisation | Member or observer |
|---|---|---|---|---|---|---|
| 1. | Albania | Mr | Tomi | **Frasheri** | Electronic and Postal Communications Authority of Albania, AKEP | Observer |
| 2. | Austria | Mr | Klaus | **Steinmaurer** | Austrian Regulatory Authority for Broadcasting and Telecommunications (RTR-GmbH) | Member |
| 3. | Belgium | Mr | Michel | **Van Bellinghen** | Institut Belge des Postes et Télécommunications (IBPT / BIPT) | Member |
| 4. | Bosnia and Herzegovina | Mr | Draško | **Milinović** | Communications Regulatory Agency of Bosnia and Herzegovina (RAK) | Observer |
| 5. | Bulgaria | Mr | Ivan | **Dimitrov** | Communications Regulation Commission (CRC) | Member |

[45] Composition of the Board of Regulators pursuant to Article 7 and Article 35(2) of Regulation (EU) 2018/1971 https://www.berec.europa.eu/en/berec/composition-of-the-board-of-regulators-pursuant-to-article-7-and-352-of-regulation-eu-20181971-1

| | | | | | | |
|---|---|---|---|---|---|---|
| 6. | Croatia | Mr | Tonko | **Obuljen** | Croatian Regulatory Authority for Network Industries (HAKOM) | Member |
| 7. | Cyprus | Mr | George | **Michaelides** | Office of the Commissioner of Telecommunications and Postal Regulation (OCECPR) | Member |
| 8. | Czech Republic | Ms | Hana | **Továrková** | Czech Telecommunication Office (CTU) | Member |
| 9. | Denmark | Ms | Katrine | **Windning** | Danish Business Authority (DBA) | Member |
| 10. | Estonia | Ms | Kristi | **Talving** | Consumer Protection and Technical Regulatory Authority (ECPTRA) | Member |
| 11. | Finland | Ms | Kirsi | **Karlamaa** | Finnish Communications Regulatory Authority (FICORA) | Member |
| 12. | France | Mr | Emmanuel | **Gabla** | Autorité de régulation des communications électroniques, des postes et de la distribution de la presse (ARCEP) | Member |
| 13. | Germany | Mr | Wilhelm | **Eschweiler** | Federal Network Agency (BNetzA) | Member |
| 14. | Greece | Mr | Konstantinos | **Masselos** | Hellenic Telecommunications and Post Commission (EETT) | Member |
| 15. | Hungary | Mr | András | **Koltay** | National Media and Infocommunications Authority (NMHH) | Member |
| 16. | Iceland | Mr | Hrafnkell | **Gislason** | Electronic Communications Office of Iceland (ECOI) | Observer |
| 17. | Ireland | Mr | Robert | **Mourik** | Commission for Communications Regulation (COMREG) | Member |
| 18. | Italy | Mr | Giacomo | **Lasorella** | Autorità per le Garanzie nelle Comunicazioni (AGCOM) | Member |

| | | | | | | |
|---|---|---|---|---|---|---|
| 19. | Kosovo | Mr | Nazim | **Rahimi** | Regulatory Authority of Electronic and Postal Communications (ARKEP) | Observer |
| 20. | Latvia | Ms | Alda | **Ozola** | Public Utilities Commission (SPRK) | Member |
| 21. | Liechtenstein | Mr | Rainer | **Schnepfleitner** | Office for Communications / Amt für Kommunikation (AK) | Observer |
| 22. | Lithuania | Ms | Jūratė | **Šovienė** | Communications Regulatory Authority (RRT) | Member |
| 23. | Luxembourg | Mr | Luc | **Tapella** | Institut Luxembourgeois de Régulation (ILR) | Member |
| 24. | Malta | Mr | Jesmond | **Bugeja** | Malta Communications Authority (MCA) | Member |
| 25. | Montenegro | Mr | Branko | **Kovijanic** | Montenegro Agency for Electronic Communications and Postal Services (EKIP) | Observer |
| 26. | North Macedonia | Mr | Jeton | **Akiku** | Agency for Electronic Communications (AEC) | Observer |
| 27. | Norway | Mr | Pål Wien | **Espen** | Norwegian Communications Authority (NKOM) | Observer |
| 28. | Poland | Mr | Jacek | **Oko** | Office of Electronic Communications (UKE) | Member |
| 29. | Portugal | Mr | Joao Antonio | **Cadete de Matos** | Autoridade Nacional de Comunicações (ANACOM) | Member |
| 30. | Romania | Mr | Vlad | **Stoica** | National Authority for Management and Regulation in Communications (ANCOM) | Member |
| 31. | Serbia | Mr | Dragan | **Pejovic** | Regulatory Agency for Electronic Communications and Postal Services (RATEL) | Observer |
| 32. | Slovak Republic | Mr | Ivan | **Martak** | Regulatory Authority for Electronic Communications and Postal Services (RÚ) | Member |

| | | | | | | |
|---|---|---|---|---|---|---|
| 33. | Slovenia | Ms | Tanja | **Muha** | Agency for Communication Networks and Services of the Republic of Slovenia (AKOS) | Member |
| 34. | Spain | Ms | Alejandra | **Iturriaga de Gandini** | Comisión Nacional de los Mercados y la Competencia **(**CNMC) | Member |
| 35. | Sweden | Mr | Dan | **Sjöblom** | National Post and Telecommunications Agency (PTS) | Member |
| 36. | The Netherlands | Ms | Annemarie | **Sipkes** | Authority for Consumers and Markets (ACM) | Member |
| 37. | Ukraine | Ms | Liliia | **Malon** | National Commission for the State Regulation of Electronic Communications, Radio Frequency Spectrum and the Provision of Postal Services (NCEC) | Observer |
| 38. | | Mr | Roberto | **Viola** | European Commission | Observer |

# Annex 6 – Plenary meetings of the Board of Regulators (BoR) in 2022

| Dates/place | Event | Agenda and Conclusions |
|---|---|---|
| 10-11 March 2022, Virtual meeting | 50th BEREC ordinary meetings | 50th Plenary |
| 8-9 June 2022, Ayia Napa, Cyprus | 51st BEREC ordinary meetings and high-level workshop | 51st Plenary |
| 5-6 October 2022, Salzburg, Austria | 52nd BEREC ordinary meetings and high-level workshop | 52nd Plenary |
| 8-9 December 2022, Prague, Czech Republic | 53rd BEREC ordinary meetings | 53rd Plenary |

# Annex 7 – Meetings of the Contact Network (CN) established prior to the Board of Regulators (BoR)

| Dates/place | Event | Agenda and Conclusions |
|---|---|---|
| 17-18 February 2022, Virtual meeting | 1st BEREC Contact Network meeting | CN1 |
| 19-20 May 2022, Dublin, Ireland | 2nd BEREC Contact Network meeting | CN2 |
| 15-16 September 2022, Riga, Latvia | 3rd BEREC Contact Network meeting | CN3 |
| 17-18 November 2022, Budapest, Hungary | 4th BEREC Contact Network meeting | CN4 |

# Annex 8 – Publicly available documents approved by the BoR in 2022

A. BEREC Opinions

| Document number | Description | Date |
|---|---|---|
| BoR (22) 54 | BEREC's statement on the draft Data Act | 12 May 2022 |
| BoR (22) 108 | BEREC Opinion on Phase II investigation pursuant to Article 33 of Directive (EU) 2018/1972: Cases PL/2022/2370-2371 Market 3a/2014 and Market 3b/2014 – update of WACC parameters in Poland | 29 June 2022 |
| BoR (22) 117 | BEREC Opinion on Phase II investigation pursuant to Article 32 of Directive (EU) 2018/1972: Cases CZ/2022/2372 and 2373 – Wholesale local access provided at a fixed location in the Czech Republic, Wholesale central access provided at a fixed location for mass-market products in the Czech Republic | 12 July 2022 |
| BoR (22) 118 | BEREC High-Level Opinion on the ECs proposal for a Data Act | 15 July 2022 |
| BoR (22) 141 | BEREC opinion on the Draft Commission implementing decision amending Decision 2007/116/EC as regards the introduction of an additional reserved number beginning with 116 – new helpline for victims of violence against women | 6 October 2022 |
| BoR (22) 142 | BEREC Opinion on the draft Commission Delegated Regulation supplementing Directive (EU) 2018/1972 of the European Parliament and of the Council with measures to ensure effective access to emergency services through emergency communications to the single European emergency number '112' | 14 October 2022 |
| BoR (22) 163 | BEREC Opinion for the evaluation of the application of Regulation (EU) 2015-2120 | 12 December 2022 |

B. BEREC Reports

| Document number | Description | Date |
|---|---|---|
| BoR (22) 83 | Draft BEREC Report on Satellite Connectivity for Universal Service | 9 June 2022 |
| BoR (22) 87 | Draft BEREC Report on the Internet Ecosystem | 9 June 2022 |
| BoR (22) 90 | Draft BEREC Report on measures for ensuring equivalence of access and choice for disabled end-users | 9 June 2022 |
| BoR (22) 68 | Report on the outcome of the public consultation on the draft BEREC Report on a consistent approach to migration and copper switch-off | 9 June 2022 |
| BoR (22) 69 | BEREC Report on a consistent approach to migration and copper switch-off | 9 June 2022 |
| BoR (22) 70 | BEREC Report on WACC parameter calculations according to the European Commission's WACC Notice (WACC parameters Report 2022) | 14 June 2022 |
| BoR (22) 73 | BoR (22) 73 Report on the monitoring of the termination rates for mobile and fixed voice calls.pdf | 9 June 2022 |
| BoR (22) 80 | BoR (22) 80 BEREC Report on the outcome of the public consultation on the draft BEREC Guidelines on the Implementation of the Open Internet Regulation | 14 June 2022 |
| BoR (22) 92 | BEREC Report on the outcomes of Public Consultation on the Draft BEREC Report on Sustainability Assessing BEREC's contribution to limiting the impact on the environment | 9 June 2022 |
| BoR (22) 99 | Draft Report on Satellite Connectivity for Universal Service | 15 June 2022 |
| BoR (22) 71 | BEREC Report on the outcome of the public consultation on the draft Net Neutrality Regulatory Assessment Methodology | 14 June 2022 |
| BoR (22) 93 | BEREC Report on Sustainability Assessing BEREC's contribution to limiting the impact of the digital sector on the environment | 9 June 2022 |
| BoR (22) 146 | BEREC Report on the outcome of the public consultation on the BEREC Guidelines on the Wholesale Roaming Guidelines | 30 September 2022 |
| BoR (22) 128 | BEREC Report on the implementation of the Open Internet Regulation 2022 | 6 October 2022 |
| BoR (22) 129 | Summary Report on the BEREC Workshop on Digital Divide, 8 June 2022 | 6 October 2022 |
| BoR (22) 130 | Intra-EU communications BEREC Benchmark Report, April 2021 – March 2022 | 6 October 2022 |
| BoR (22) 131 | Annex I – BEREC Benchmark Intra-EU communication | 6 October 2022 |
| BoR (22) 132 | BEREC Report on Western Balkan Roaming, October 2021 – March 2022 | 6 October 2022 |
| BoR (22) 138 | Summary Report: BEREC Open RAN workshop, 24 May 2022 | 6 October 2022 |

| | | |
|---|---|---|
| BoR (22) 144 | BEREC Report on the 5G Ecosystem | 6 October 2022 |
| BoR (22) 139 | Draft BEREC Report on comparison tools and accreditation | 6 October 2022 |
| BoR (22) 165 | BEREC Report about the Study Visit to the East Coast of the United States of America | 12 December 2022 |
| BoR (22) 167 | BEREC Report on the Internet Ecosystem | 12 December 2022 |
| BoR (22) 183 | Report on number-independent interpersonal communication services (NI-ICS) revenue indicators | 12 December 2022 |
| BoR (22) 175 | BEREC Report on the participation of NRAs in different cybersecurity fora at EU level | 12 December 2022 |
| BoR (22) 173 | Report on the outcomes of public consultation on the BEREC Guidelines on Regulation (EU) 2022/612 and Commission Implementing Regulation (EU) 2016/2286 | 12 December 2022 |
| BoR (22) 169 | Report on satellite connectivity for universal service | 12 December 2022 |
| BoR (22) 168 | Report on the outcomes of public consultation on the Report on satellite connectivity for universal service | 12 December 2022 |
| BoR (22) 172 | Report on best practices for ensuring equivalence of access and choice for disabled end-users | 12 December 2022 |
| BoR (22) 197 | BEREC Report on ECA Audit recommendations for 5G cybersecurity | 12 December 2022 |
| BoR (22) 194 | Report of the outcomes of the Public Consultation on the BEREC Work Programme 2023 | 12 December 2022 |
| BoR (22) 164 | BEREC Report Regulatory Accounting in Practice 2022 | 12 December 2022 |
| BoR (22) 188 | Draft BEREC Report on Competition amongst multiple operators of NGA-networks in the same geographical region | 12 December 2022 |
| BoR (22) 187 | Draft BEREC Report on Interoperability of Number-Independent Interpersonal Communication Services (NI-ICS) | 12 December 2022 |
| BoR (22) 191 | Draft Report on challenges and benefits of Artificial Intelligence (AI) solutions in the telecommunications sector (including use cases) | 12 December 2022 |
| BoR (22) 185 | Draft BEREC Report on the regulatory treatment for business services | 12 December 2022 |
| BoR (22) 166 | BEREC Report on the outcome of the public consultation on the BEREC Report on the internet ecosystem | 12 December 2022 |
| BoR (22) 189 | Study on NRA Independence- Final report | 12 December 2022 |
| BoR (22) 171 | BEREC Report on the outcomes of public consultation on the draft BEREC Report on best practices for ensuring equivalence of access and choice for disabled end-users | 12 December 2022 |

C. BEREC public consultations

| Document number | Description | Date |
|---|---|---|
| BoR (22) 64 | Notice for the launch of the public consultation on the draft BEREC guidelines on the application of Article 3 of Regulation (EU) 2022/612 of 6 April 2022 on roaming on public communications networks within the Union (Wholesale Roaming Guidelines) | 24 May 2022 |
| BoR (22) 100 | Notice to launch public consultation on the draft BEREC Report on the Internet Ecosystem | 15 June 2022 |
| BoR (22) 101 | Notice to launch public consultation on the draft BEREC Report on measure for Ensuring Equivalence of Access and Choice for Disabled end-users | 15 June 2022 |
| BoR (22) 156 | Press Release – BEREC launches its Work Programme 2023 for public consultation | 12 October 2022 |

D. Strategies, annual work programme and annual reports

| Document number | Description | Date |
|---|---|---|
| BoR (22) 78 | BEREC Annual Reports 2021 | 9 June 2022 |
| BoR (22) 143 | Draft BEREC Work Programme 2023 | 7 October 2022 |
| BoR (22) 193 | BEREC Work Programme 2023 | 12 December 2022 |

E. Regulatory best practices (Common approaches/positions, Guidelines, Methodologies)

| Document number | Description | Date |
|---|---|---|
| BoR (22) 55 | Draft BEREC Guidelines on the application of Article 3 of Regulation (EU) 2022/612 of 6 April 2022 on roaming on public communications networks within the Union (Wholesale Roaming Guidelines) | 24 May 2022 |
| BoR (22) 88 | Draft BEREC guidelines on Regulation (EU) 2022/612 and Commission Implementing Regulation (EU) 2016/2286 (Retail Roaming Guidelines) | 9 June 2022 |
| BoR (22) 81 | BEREC Guidelines on the Implementation of the Open Internet Regulation | 9 June 2022 |
| BoR (22) 81 | BEREC Guidelines on the Implementation of the Open Internet Regulation – Comparison document 2022 vs 2020 | 14 June 2022 |

| | | |
|---|---|---|
| BoR (22) 72 | BEREC Net Neutrality Regulatory Assessment Methodology | 15 June 2022 |
| BoR(22) 147 | BEREC Guidelines on the application of Article 3 of Regulation (EU) 2022/612 of 6 April 2022 on roaming on public communications networks within the Union (Wholesale Roaming Guidelines | 30 September 2022 |
| BoR (22) 137 | BEREC preliminary assessment of the underlying assumptions of payments from large CAPs to ISPs | 7 October 2022 |
| BoR (22) 174 | BEREC Guidelines on Regulation (EU) 2022/612 and Commission Implementing Regulation (EU) 2016/2286 (Retail Roaming Guidelines) | 12 December 2022 |
| BoR (22) 170 | Procedures for the BEREC Databases of numbering ranges for value-added services and means of access to emergency services for roaming users | 12 December 2022 |

F. Other documents

| Document number | Description | Date |
|---|---|---|
| BoR (22) 39 | BEREC calendar of international activities and events in 2022 | 10 March 2022 |
| BoR (22) 47 | Conclusions of the 50th Ordinary Plenary Meeting of the BEREC Board of Regulators | 10 March 2022 |
| BoR (22) 52 | Nomination concerning a new Member of the Board of Regulators from the Hungarian regulator NMHH | 4 April 2022 |
| BoR (22) 59 | Voting report on the draft BoR decision on the appointment of the co-Chair for End-User EWG | 10 May 2022 |
| BoR (22) 62 | Voting report on the draft BEREC statement on the draft Data Act | 13 May 2022 |
| BoR (22) 66 | Voting report on the draft BEREC Wholesale Roaming Guidelines | 24 May 2022 |
| BoR (22) 67 | Draft Agenda for 51st Board of Regulators (BoR) hybrid meeting in 2022 | 27 May 2022 |
| BoR (22) 39 | Conclusions of the 51st Ordinary Plenary Meeting of the BEREC Office Management Board | 10 June 2022 |
| BoR (22) 98 | Nomination concerning a new Alternate to a Member of the Board of Regulators from the Latvian regulator SPRK | 14 June 2022 |
| BoR (22) 97 | Nomination concerning a new Member of the Board of Regulators from the Estonian regulator ECPTRA | 14 June 2022 |
| BoR (22) 89 | An overview of the BEREC work on the national resilience of network operations | 14 June 2022 |
| BoR (22) 96 | Press release – BEREC identifies new dynamics on connectivity issues and competition in draft report on internet ecosystem | 15 June 2022 |

| | | |
|---|---|---|
| BoR (22) 103 | Conclusions of the 51st Ordinary Plenary Meeting of the BEREC Board of Regulators | 9 June 2022 |
| BoR (22) 109 | Memorandum of Understanding between BEREC and CRTC | 27 June 2022 |
| BoR (22) 106 | Voting report on the draft BEREC Opinion on Article 33 Phase II Case PL/2022/2370-2371 | 29 June 2022 |
| BoR (22) 95 | BEREC Analysis Monitoring of measures in relation to the war in Ukraine | 4 July 2022 |
| BoR (22) 110 | Decision No BoR/2022/02 of the Board of Regulators on the appointment of the Planning and Future Trends Working Group Co-Chair | 7 July 2022 |
| BoR (22) 116 | Voting report on the draft Decision of the Board of Regulators on the appointment of the Planning and Future Trends Working Group (PFT WG) Co-Chair | 7 July 2022 |
| BoR (22) 113 | Voting report on the draft BEREC Opinion on Article 32 Phase II cases CZ/2022/2372 & 2373 | 13 July 2022 |
| BoR (22) 119 | Nomination concerning a new Member of the Board of Regulators from the Lithuanian regulator RRT | 13 July 2022 |
| BoR (22) 122 | Voting report on the BEREC High-Level Opinion on the European Commission's proposal for a Data Act | 15 July 2022 |
| BoR (22) 123 | Memorandum of Understanding between the Body of European Regulators for Electronic Communications (BEREC) and the United States Federal Communications Commission (FCC) | 12 September 2022 |
| BoR (22) 126 | Voting report on the Draft BoR Decision to establish a MoU between BEREC and FCC | 13 September 2022 |
| BoR (22) 148 | Nomination concerning a new Participant of the Board of Regulators from the Ukrainian regulator NCEC | 29 August 2022 |
| BoR (22) 149 | Nomination concerning a new Alternate to a Participant of the Board of Regulators from the Ukrainian regulator NCEC | 29 August 2022 |
| BoR (22) 127 | Draft Agenda for 52nd Board of Regulators (BoR) hybrid meeting in 2022 | 30 September 2022 |
| BoR(22)152 | Voting report on the e-voting procedure on the draft BEREC Guidelines on the new Roaming Regulation (EU) 2022/612 and Commission Implementing Regulation (EU) 2016/2286 (Wholesale Roaming Guidelines) | 30 September 2022 |
| BoR (22) 161 | Voting report on the e-voting procedure on the draft BEREC Opinion on EC's Delegated Regulation with measures to ensure effective access to emergency services through emergency communications through emergency communications to the single European emergency number '112' | 14 October 2022 |

| | | |
|---|---|---|
| BoR (22) 184 | External Study on Communication Services for Businesses in Europe: Status Quo and Future Trends | 12 December 2022 |
| BoR (22) 201 | Press release – BEREC 2023 chairmanship handed over to Greek regulator | 14 December 2022 |
| BoR (22) 205 | Nomination concerning a new Alternate to a Participant of the Board of Regulators from the Liechtenstein regulator AK | 21 December 2022 |

# Annex 9 – Board of Regulators electronic voting procedures

| No. | Subject | Comments round Date/link to documents | Voting round Date/link to documents |
|---|---|---|---|
| 1. | Outline BEREC Work Programme 2023 | 12 January 2022 | 20 January 2022 |
| 2. | Draft BEREC Opinion on Article 32 Phase II Case CZ/2021/2351 | 14 January 2022 | 21 January 2022 |
| 3. | Draft BEREC response to the public consultation on the draft revised EC Guidelines on State aid for broadband networks – Part I: Draft revised EC Guidelines on State aid for broadband networks except Annex I 'Mapping' and Part II: Annex I 'Mapping' of the draft revised EC Guidelines on State aid for broadband networks | 7 February 2022 | 9 February 2022 |
| 4. | BoR decision on the appointment of the co-Chair for End-User EWG | 4 May 2022 | 5 May 2022 |
| 5. | BEREC statement on the draft Data Act | 5 May 2022 | 11 May 2022 |
| 6. | Draft BEREC Wholesale Roaming Guidelines | 9 May 2022 | 24 May 2022 |
| 7. | Article 33 PL 2370-2371/2022 | 17 June 2022 | 27 June 2022 |
| 8. | Article 32 Phase II case: CZ/202/2372-2373 | 1 July 2022 | 8 July 2022 |
| 9. | BoR decision on the appointment of the co-Chair for PFT EWG | 1 July 2022 | 5 July 2022 |
| 10. | BEREC High-Level Opinion on the European Commission's proposal for a Data Act | 11 July 2022 | 13 July 2022 |
| 11. | Draft MoU BEREC-FCC | 8 September 2022 | 9 September 2022 |
| 12. | Wholesale Roaming Guidelines | 23 September 2022 | 28 September 2022 |
| 13. | BEREC Opinion on the draft Commission Delegated Regulation – 112 | 10 October 2022 | 12 October 2022 |

# Annex 10 – List of acronyms

ANO: Alternative Network Operator

BEREC: Body of European Regulators for Electronic Communications

BoR: Board of Regulators

BU-LRIC: Bottom Up Long Run Incremental Cost

CAPs: Content and Application Providers

CAPM: Capital Asset Pricing Model

CJEU: Court of Justice of the European Union

CRTC: Canadian Radio-television and Telecommunication Commission

DA: Digital Act

DESI: Digital Economy and Society Index

DMA: Digital Markets Act

DOCSIS: Data Over Cable Service Interface Specification

DSA: Digital Service Act

EaPeReg: Eastern Partnership Electronic Communications Regulators Network

ECS: Electronic Communications Services

ECN: Electronic Communication Networks

EEA: European Economic Area

EECC: European Electronic Communications Code

ENISA: European Union Agency for Network and Information Security

ERP: Equity Risk Premium

ERGA: European Regulators Group for Audiovisual Media Services

EU: European Union

FCC: Federal Communications Commission (United States of America)

FDC: Fully-Distributed Costs

FTTB: Fibre-To-The-Building

FTTC: Fibre-To-The-Cabinet

FTTdp: Fibre-To-The-Distribution-Point

FTTH: Fibre-To-The-Home

FTTN: Fibre-To-The-Node

FTTP: Fibre-To-The-Premises

IAS: Internet Access Services

ITRE: European Parliamentary Committee on Industry, Research and Energy

ITU: International Telecommunications Union

LLU: Local Loop Unbundling

LRAIC: Long-Run (Average) Incremental Costs

LRIC: Long-Run Incremental Costs

LTE: Long-Term Evolution

MNO: Mobile Network Operator

MoU: Memorandum of Understanding

MVNO: Mobile Virtual Network Operator

NCA: National Competition Authority

NGA: Next Generation Access

NIS: Network and Information Systems

NRA: National Regulatory Authority

NTP: Network Termination Point

OCA: Other Competent Authority

QoS: Quality of Service

REGULATEL: Latin American Forum of Telecommunications Regulators

RFR: Risk Free Rate

RLAH: Roam Like At Home

RSPG: Radio Spectrum Policy Group

SMP: Significant Market Power

SMS: Short Message Service

TRAI: Telecom Regulatory Authority of India

ULL: Unbundled Local Loop

VDSL: Very-High-Bit-Rate Digital Subscriber Line

VHCN: Very High Capacity Network

VULA: Virtual Unbundled Local Access

WACC: Weighted Average Cost of Capital