BoR (21) 01

Outline BEREC Work Programme 2022

27 January 2021

Content

I.   INTRODUCTION

The Body of European Regulators for Electronic Communications (BEREC) was established in 2009 and now operates under Regulation (EU) 2018/1971[1] with the aim of pursuing the objectives under the EECC and in particular to ensure the consistent implementation of the regulatory framework for electronic communications.

This document is the Outline of the annual work programme of BEREC, which has to be adopted by 31 January of the year preceding that to which the annual work programme relates[2].

The objectives of the Outline BEREC Work Programme 2022 continue to be based on the mandatory tasks falling to BEREC stemming from the European Electronic Communications Code (EECC). Implementing the new EECC in a consistent way is to the forefront of BEREC's work. Furthermore, the objectives of this Outline, and the Work Programme will be aligned with the BEREC Strategy 2021-2025.

The Outline Work Programme 2022 reflects BEREC's commitment to serve as a body for thoughtful and proactive debate that provides advice to the European Parliament, the Council and the European Commission in the field of electronic communications. Furthermore, BEREC's future aims are to play an important role in further improving the consistent and harmonised application of regulatory rules, to enhance its working methods and to engage cooperatively and effectively with stakeholders.

In line with the practice of previous years and in accordance with Article 21 of the BEREC Regulation, the draft BEREC Work Programme 2022 will be consulted to the European Parliament, the Council and the Commission on their priorities and will be subject to a public consultation. The public consultation will run for a 4-week period in October and November 2021. The final BEREC Work Programme 2022 will be adopted at the fourth BEREC Board of Regulators meeting in December 2021. BEREC will publish and transmit the annual work programme to the European Parliament, the Council and the Commission as soon as it is adopted.

II.   BACKGROUND

The four objectives of the EECC (Article 3 (2))[3] remain the foundation of the assignments set out in BEREC's annual work programs and continue to be the guiding force of the Work Programme. These four objectives are:

-        Promoting connectivity and access to very high capacity networks,

---

[1]

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), amending Regulation (EU) 2015/2120 and repealing Regulation (EC) No 1211/2009

[2] According to Article 21 of the BEREC Regulation

[3]

Directive (EU) 2018/1972 of the European Parliament and of the Council of 11 December 2018 establishing the European Electronic Communications Code (Recast)

- Promoting competition and efficient investment,

- Contributing to the development of the internal market,

- Promoting the interests of the citizens of the Union.

While the EECC, the BEREC Regulation and the mandatory tasks stemming from these legislative instruments provide the basis for the Outline BEREC Work Programme 2022, BEREC has adopted a new strategy for the years 2021-2025. The strategy and its high-level strategic priorities will be fundamental to the work that BEREC will undertake in 2022. While the Outline Work Programme 2022 seeks to address current regulatory challenges, it has also been developed to prepare for the new challenges ahead resulting from political, economic and technological developments.

This Outline Work Programme 2022 contains those items from the 2021 Work Programme which will need to be carried over into 2022, in addition to ad-hoc or recurring items, including some preliminary identified potential workstream proposals. BEREC has recently consulted those potential workstreams[4] and will consider the received input for the final version of the 2022 Work Programme.

As required by the BEREC Regulation, when developing its annual Work Programme, BEREC seeks the views and proposals from the NRAs participating in BEREC and BEREC's own Working Groups, the European institutions (Article 21.1 Regulation (EU) 2018/1971), and indeed third parties and stakeholders. Furthermore, BEREC organizes on a yearly basis a forum with stakeholders ('Stakeholder Forum') with the aim to enhance transparency and collect the interested parties' views on BEREC's current and future work and, in particular, for the elaboration of the work programmes. In 2021 BEREC is planning to hold two Stakeholder Forums: the first will be a virtual meeting on 1 April and the second on 28 October in Brussels. The public consultation of the Work Programme 2022 will be launched in the second Stakeholder Forum.

---

[4] Section 'IV. Potential work for 2022 and beyond' of the draft BEREC Work Programme 2021 (BoR (20) 220)

III. BEREC WORK IN 2022

BEREC will execute its work streams around the four strategic objectives of the EECC and in doing so BEREC will take into consideration the BEREC high-level strategic priorities for the period of 2021-2025 that will be identified as most relevant for meeting the objectives as well as the institutional and international cooperation.

1. High-level strategic priorities

The high-level BEREC 2021-2025 strategic priorities are based on the market developments and refer to areas of interest that BEREC should cover under one or several of the strategic objectives of the EECC.

BEREC will also consider the Green Deal and the Agenda 2030 targets to identify how BEREC can contribute to the achievement of the sustainable development goals.

Furthermore, the BEREC 5G Radar will serve as an important source for projects that can be linked to the strategic priorities.

Strategic priority 1: Promoting full connectivity

Promoting connectivity and access to electronic communication networks will be a strategic priority for BEREC in the coming five years. This implies prioritizing work that improves the conditions for the expansion and take-up of secure, competitive and reliant very-high-capacity networks (both fixed and wireless) across Europe.

Strategic priority 2: Supporting sustainable and open digital markets

Under this priority, BEREC will prioritize work that relates to the functioning of the digital markets. This implies focusing on issues that explore regulatory conditions and address issues for digital service providers and end-users in the digital market. One of those issues also arise with regard to legislative proposals, which BEREC typically contributes to - such as for instance for the DMA should the negotiations continue in 2022.

Strategic priority 3: Empowering End-users

Promoting the interests of consumers in the fast-evolving digital ecosystem will require strong consumer protection rules via data driven regulation, consumer transparency and digital skills

BEREC will continue to prioritize work that empowers end-users to make better informed choices in relation to digital services. BEREC will also further support building trust in ICT.

This strategic priority relies on a regular dialogue with consumer and civil society representatives.

2. Cooperation with EU institutions and institutional groups

Institutional cooperation

In 2021 BEREC will explore ways to have closer collaboration and dialogue with other European bodies, by joining forces on certain topics in which synergies can be obtained with other European regulatory cooperation platforms and bodies operating both in adjacent and different economic sectors. BEREC has already established ties with a number of European institutions, such as the European Data Protection Board (EDPB), the European Regulators Group for Audio-visual Media Services (ERGA), the European Union Agency for Cybersecurity (ENISA) and the European Regulators Group for Postal Services (ERGP). BEREC will continue to work together with the Radio Spectrum Policy Group (RSPG), based on the established working arrangement in 2019, with the intention to strengthen the collaboration between the two bodies. BEREC considers it meaningful to further exchange with other regulatory bodies and networks such as the European Competition Network (ECN), Eurostat (Statistical Office of the European Union), the ESA (European Space Agency) and the EEA (European Environment Agency). The involvement of multiple bodies - early in the process - will be increasingly valuable and necessary, especially in the context of regulatory issues with a horizontal impact related to, for example, the internet value chain, digital service providers, the development of 5G, network security, environmental issues and adapting competition rules to a digital platform economy. In addition, while monitoring the sector, it remains crucial to oversee the big picture, which implies expanding knowledge to other terrains. This exploration will result in 2021 in a medium-term Strategy for relations with other bodies. There shall be a focus on connectivity/5G and platform regulation. In 2022 BEREC will implement and follow this medium-term Strategy in its relations with other institutions.

Part of the activities in 2022 will be the collaboration with the RSPG on the implementation of Article 35 of the EECC (the peer review forum). BEREC will also continue to play a supporting role regarding 5G and cybersecurity, as well as continuing the close cooperation with the NIS Cooperation Group and the European Union Agency for Cybersecurity (ENISA).

International cooperation

The increasing volume of electronic communications between the EU and the rest of the world shows the global nature of such services and means that policies, legislation and regulation must be seen from a more global perspective. BEREC benefits from the cooperation with NRAs and with international regulator networks, policymakers and institutions involved in communications matters based beyond the EU. In 2022 BEREC will continue to engage in a dialogue with NRAs based outside the EU, as well as with international regulatory networks, policy makers and institutions in the field of electronic communications. These activities will be based on a medium-term Strategy and a multi-annual Working Programme related to its international activities, developed in 2021.

BEREC international activities complement the policies of the European Union both in terms of the subjects of cooperation and the priority regions to cooperate with.

In 2022 BEREC will continue to provide support to the European Commission with respect to the Western Balkans initiative, as well as continuing to develop and strengthen its ties with regulatory authorities such as the FCC, TRAI, CRTC and with regional regulatory networks (EMERG, EaPeReg, PRIDA, and Regulatel)[5], in accordance with the BEREC Regulation and in cooperation with the EU external action services.[6]

3. BEREC tasks under the EU legislation

There is also a significant number of tasks that BEREC carries out on an ongoing basis, described hereunder, under the following headings:

- EECC
- Open Internet
- Roaming and intra-EEA communications

3.1 EECC

Delegated act concerning emergency communications

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 public safety answering point (PSAP). The first such delegated act shall be adopted by 21 December 2022.

Ad hoc input to the EU/NRAs

BEREC will remain available to provide *ad hoc* input on request to the EU institutions (EC, Parliament and Council), particularly during the implementation of new legislation. BEREC will also be the forum for its member NRAs to discuss newly emerging questions and issues.

BEREC Opinions under Article 32/33

---

[5] EMERG (European Mediterranean Regulators Group), EaPeReg (Eastern Partnership of Regulators for Electronic Communications Networks and Services), PRIDA (Policy and Regulation Initiative for Digital Africa), and Regulatel (Latin American Forum of Telecommunications Regulators).
[6] FCC (Federal Communications Commission, USA), TRAI (Telecom Regulatory Authority of India), CRTC (Canadian Radio-television and Telecommunications Commission).,

BEREC will continue to issue opinions concerning new Phase II cases when they arise based on the expertise of the market analysis of its NRAs. The aim is to achieve a high degree of consistency regarding measures imposed by NRAs in order to contribute to the development of the internal market for electronic communications.

Guidelines detailing Quality of Service parameters

In accordance with Article 104(2) of the EECC, the present Guidelines are issued to provide guidance to National Regulatory Authorities (NRAs) in respect to Article 104 of the EECC and to contribute to the consistent application of Article 104(2) and Annex X, with the aim of defining:

- the relevant Quality of Service (QoS) parameters, including the parameters relevant for end-users with disabilities;

- the applicable measurement methods for these QoS parameters, including, where appropriate, the ETSI and ITU standards set out in Annex X of the EECC in relation to Interpersonal Communications Services ("ICS") and Internet Access Services ("IAS"), respectively;

- the content and format of publication of the QoS information;

- the quality certification mechanisms.

These Guidelines are expected to be reviewed by 2023. BEREC will have to start the procedure in 2022.

Report on best practices to support the defining of adequate broadband Internet Access Service (IAS)

Based on Article 84(3) of the EECC, this report offers an insight into the practices of the Member States, as broadband has been introduced under a Universal Service Obligation. This report is envisaged to be updated by the end of 2024. The process, which includes a public consultation, will start in 2022.

End user rights – review by the Commission

According to Article 123 of the EECC, BEREC will monitor the rights of end-users, by analysing the technological and market developments in the use of the different types of electronic communications services and on their impact on the application of the end-user rights.

Peer review process

According to the EECC (Article 35), when an NRA and/or competent authority intends to undertake a selection procedure in relation to radio spectrum bands for which technical conditions have been harmonised in order to enable their use for wireless broadband electronic communications networks and services, it shall inform the RSPG about any such

draft measures and indicate whether and when it will request the RSPG to convene a Peer Review Forum. The Peer Review forum shall be open to experts from BEREC.

3.2   Open internet

Implementation of the Regulation (EU) 2015/2120 and BEREC Guidelines on the Implementation of the Open Internet (OI) Regulation

Regulation 2015/2120 prescribes that NRAs shall "closely monitor and ensure compliance" with the Regulation, and that NRAs shall "publish reports on an annual basis regarding their monitoring and findings". BEREC will publish a report on the implementation of the Regulation, based on the NRAs' annual reports and NRAs' answers to internal questionnaires. In addition to the implementation report, it will also be about exchanging practices concerning the supervision of the implementation of the OI regulation. The adoption of the final report is foreseen in October 2022.

3.3   Roaming and intra-EEA communications

International Roaming benchmark data report

According to the Roaming Regulation, BEREC must produce two benchmark reports on the evolution of prices and volumes on an annual basis. For 2021 it is planned to publish the:

28th benchmark report (including the 2nd and 3rd quarter 2021)

29th benchmark report (including the 4th quarter 2020 and the 1st quarter 2022)

According to Article 4.1 of the BEREC Regulation[7], BEREC will report on technical matters within its competence, in particular on (among others) the evolution of pricing and consumer patterns both for domestic and roaming services, the evolution of actual wholesale roaming rates for unbalanced traffic, the relationship between retail prices, and wholesale charges and wholesale costs for roaming services.

The data to be collected by BEREC shall be notified to the EC at least twice a year. Based on the collected data, BEREC shall also report regularly on the evolution of pricing and consumption patterns in the Member States, both for domestic and roaming services and the evolution of actual wholesale roaming rates for balanced and unbalanced traffic.

Transparency and comparability of international roaming tariffs

According to Article 19 (4) of the Roaming Regulation, BEREC is obliged to collect information from NRAs annually on the transparency and comparability of different roaming

---

[7] BEREC regulatory tasks in accordance with Regulation (EU) No 531/2012 on roaming on public mobile communications networks within the Union

tariffs offered by operators to their customers. The tenth of these reports is due at Plenary 4 2022.

Input on the weighted average of maximum mobile termination rates across the EU

According to Article 6e (2) of the Roaming Regulation as amended by Regulation 2015/2120, the European Commission must review the Implementing Acts setting out the weighted average of maximum mobile termination rates every year, using the same procedure. BEREC needs to provide an annual input to the European Commission on this matter. The input to the Commission will be drafted based on the data collected as of 1 July 2022. This work is subject to the single maximum Union-wide mobile voice and fixed voice termination rates set in the delegated act.

Intra-EU communications Benchmark Report

According to Article 5a (6) of the TSM Regulation as amended by Regulation (EU) 2018/1971, NRAs shall monitor the price developments of regulated intra-EU communications services. For this purpose, BEREC provides a template to contribute to a harmonised data collection in the EU/EEA. NRAs are therefore collecting data from both fixed and mobile operators on a yearly basis and will submit the data to BEREC. In 2022 BEREC is planning to publish the 3rd Benchmark Report on the findings, based on data collection.

4. Quality and efficiency

An important role of BEREC is the establishment of best practices and share learnings among its members. BEREC carries out a number of tasks to increase quality and efficiency in regulation in Europe.

Article 32/33 Phase II process

Since 2014 BEREC has undertaken an annual analysis of Article 32/33 EECC Phase II cases, aimed at gaining a better understanding of both the procedural and substantive aspects of these cases and at informing the prospective review of the BEREC Common Positions. In 2015, a comprehensive database of Phase II cases was developed, including the main elements of the cases, in particular the reasoning put forward by the EC, the analyses in the BEREC Opinions, and the final outcomes of the cases.

BEREC will continue to add new Phase II cases to this database as and when they arise. The objective is that the database can be consulted by BEREC members, in particular experts of Phase II cases, both for referencing a particular case and to analyse key themes amongst the cases over time.

WACC parameters' calculation according to the EC Notice

Following the Commission's Notice on the WACC of 7 November 2019, BEREC's task is to calculate various parameters of the WACC formula according to the methodology laid down in the EU WACC Notice. BEREC in close collaboration with the EC will identify a peer group of EU SMP operators for the calculation of some of these parameters.

In order for NRAs to be able to take the parameters into account when calculating the WACC for the national markets BEREC will calculate the parameters at the beginning of the year.

Report on regulatory accounting in practice

The Regulatory Accounting in practice Report will provide an up-to-date factual overview of the regulatory accounting frameworks used in Europe and an assessment of the level of consistency achieved by NRAs. The Report is prepared annually and updates the previous versions published since 2005. In 2022, emphasis will continue to be placed on consistency in regulatory accounting with respect to key access products (including e.g. fibre) and will seek to maintain the detail and the in-depth analysis of the methods covered to identify commonalities and reasons for differences. The Report will continue to collect data on the methodology and input parameters used to calculate the rate of return on capital employed and look into the impact of both on the result.

Collaboration on the Net Neutrality Measurement tools

In 2022 and beyond, BEREC will continue to work towards a harmonised measurement framework and to support NRAs in their national measurement tool deployments. This could include for example providing a forum for NRAs to share information and exchange experiences and best practices and by working together to improve the measurements and by sharing code or components between NRAs.

Stock-taking on national experiences of the implementation of the EECC

The national implementation process of the EECC was due to be finalised by the end of 2020. By 2022, NRAs would have early experiences of applying the new regulatory framework and could give assessments on how the new electronic communication framework contributes to achieving the objectives of the EECC.

The internal workshop in Q4 2021, where NRAs share their experiences, could lead to further work with the need for more detailed national assessments of the EECC, and of the application of the BEREC Guidelines. The outcome of this workshop can also be used for further work feeding into a more general monitoring of the key elements of the functioning of the EECC.

5. Communication and engagement

BEREC will continue to engage with stakeholders, with the goal of focusing its work on issues that are relevant to them. The Outline Work Programme 2022 therefore includes the following activities that contribute to BEREC's objective with respect to these principles.

BEREC Annual reports

According to the BEREC Regulation, BEREC shall provide its annual activity report to the European Parliament, the Council, the EC and the European Economic and Social Committee by 15 June of the year subsequent to the year reported on in the annual activity report. BEREC shall report annually on technical matters within its competence, in particular on the market developments in the electronic communications sector.

BEREC will continue to publish its annual report on its activities and an annual report on developments in the sector as part of a single document. Whereas the Annual Report on BEREC activities focuses on the outcome of the work of its Expert Working Groups and ad-hoc teams based on the Work Programme, the Annual Report on developments in the electronic communications sector summarises BEREC's view on the past year as well as a perspective of future developments and challenges in the sector.

Stakeholder Forum

The focus of the Stakeholder Forum in 2022 will be the BEREC Work Programme for the following year (i.e. 2023), and it will provide a platform for stakeholders and BEREC to engage in a dialogue for BEREC's future work. The feedback received at the Stakeholder Forum will continue to be an important complement to the written inputs received during the public consultation for the BEREC Work Programme.

BEREC Communications Plan 2022

The overall framework of BEREC communications is presented in the multiannual BEREC External Communications Strategy. Every annual communications plan sets out the exact activities that BEREC is performing to deliver on these objectives. In addition to the objectives set out in the Communications Plan, BEREC will continue to communicate around the day-to-day activities of BEREC's work, especially regarding the most relevant topics for BEREC and its members. The projects are normally linked to the regular BEREC events, such as public debriefings and the Stakeholder Forum, and include several specific communications activities, for example the organisation of events, the production of a video, press releases, information for the website, a social media campaign, press interviews etc.

Outline of the BEREC Work Programme 2023

The BEREC Regulation sets out a new process for developing the Work Programme. According to the Regulation the Board of Regulators shall adopt the outline of its annual work programme by 31 January of the year preceding that to which the annual work

programme relates. After consulting the European Parliament, the Council and the Commission on their priorities, as well as consulting other interested parties, the Board of Regulators shall adopt the final annual work programme by 31 December of the same year. The Board of Regulators shall transmit the annual work programme to the European Parliament, the Council and the Commission as soon as it is adopted. BEREC will provide a draft/provisional Work Programme outline by the end of January 2022, and then work through the year to finalise the Work Programme for 2023 by the end of the year.

6. Carry-over projects from 2021

This chapter contains items that are continuations or follow up projects of work started in previous years. In some cases the second phase of a project is the finalization of a report after processing the stakeholder input from a public consultation.

Report on a consistent approach to migration and copper switch-off

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 user. Therefore, the importance of the copper-based access network decreases and NRAs are increasingly confronted with the situation wherein the SMP operator wants to decommission its legacy copper-based access network and to close MDFs.

According to Art. 81 of the EECC, SMP operators must notify the NRA in advance and in a timely manner when they plan to decommission parts of the network. The NRA has to ensure that the decommissioning process includes a transparent timetable and conditions, including an appropriate notice period for transition and the NRA also has to establish the availability of alternative products of at least comparable quality if necessary to safeguard competition and the rights of end-users.

Building further upon the experiences shared in an internal workshop, BEREC will issue a Report aiming to develop a consistent approach to migration and copper switch-off. Based on detailed data collected from the respective NRAs which will include also the stakeholders' view on migration and their involvement at national level, the aim of the Report is to identify a consistent approach to migration and copper switch-off.

Report on regulatory treatment for backhaul

Backhaul infrastructure is key for enabling 5G and facilitating the deployment of very high-speed networks. Moreover, the new Recommendation on relevant markets[8] addresses the issue of how to take account of backhaul in the process of relevant markets.

---

[8] Commission recommendation of 18.12.2020 on relevant product and service markets within the electronic communications sector susceptible to ex ante regulation

BEREC plans to 1) review how backhaul is addressed in market analysis by NRAs, preparing a snapshot on how backhaul is regulated (if so) in each country and 2) provide guidance on how to apply in the market analysis process any relevant provision regarding backhaul in the EECC and related recommendations. Given the revised Recommendation on relevant markets by the European Commission the provisions on backhaul will be especially analysed. BEREC will also assess the need of preparing a common position on the regulatory treatment of backhaul.

Report assessing BEREC's contribution to limiting the impact on the environment

In line with the political guidelines[9] of Commission President von der Leyen, setting out the need for a green and digital transformation of Europe, BEREC will continue engaging in working on the sustainability of the ICT-related parts of the upcoming Green Deal, and the Agenda 2030 targets. BEREC will continue working for sustainability in the digital sector under the EECC, to position itself in relation to the Commission's expectations in this area.

In December 2020, BEREC contracted a consultant to provide a study, identifying key information that may become a decision support tool in the field of sustainability. The study will provide BEREC with information regarding the impact on the environment of the digital sector in general and of the electronic communications sector in particular. The central question of the study should address whether there is scope within the regulatory actions of NRAs under the EECC to positively impact or minimise the negative impact of the sector on the environment. The study will compile factual knowledge to support BEREC and its members to identify and develop initiatives that could best contribute to limiting the adverse environmental effects of the sector, taking into account current regulatory objectives.

The conclusions of the study will be integrated in a BEREC Report that will include an overview of NRA initiatives with positive impacts on the environment. This report will be subject to a public consultation and will be adopted at Plenary 2 2022.

Update of the Net Neutrality regulatory assessment methodology

In 2017, BEREC published the BEREC Net Neutrality Regulatory Assessment Methodology[10] (BoR (17) 178), which was part of the groundwork for BEREC to work towards a harmonised measurement framework. This work item is linked to strategic priorities 2 (Supporting sustainable and open digital markets) and 3 (Empowering end-users), as reliable internet access quality measurement systems serve both purposes.

In 2021 BEREC intends to work towards a common, harmonised measurement framework potentially including an update to the 2017 BEREC Net Neutrality Regulatory Assessment Methodology and based on learnings from national and European measurement tool development and benchmarking. This work is expected to include a revision of the internet

---

[9] See https://ec.europa.eu/commission/sites/beta-political/files/political-guidelines-next-commission_en.pdf
[10] See https://berec.europa.eu/eng/document_register/subject_matter/berec/regulatory_best_practices/methodologies/7295-berec-net-neutrality-regulatory-assessment-methodology

access service QoS measurement methodology, by considering topics such as how to calibrate the tool; how to measure higher bit rates on 5G and fibre networks more accurately, etc.

The update may also include a review of best practices for the certified monitoring mechanism, as defined in the Open Internet Regulation, and how to best utilise the measurement tools in terms of the NRAs' supervisory roles.

Report on the internet value chain

BEREC has traditionally focused its work on the part of the Internet value chain directly related to electronic communication networks, internet access services and end-user equipment. These regulated components are essential for end-users to use the applications provided via the Internet. However, ECSs and telecommunication networks are just a part of a vast and complex ecosystem that allows end-users and the whole society to benefit from the extraordinary potential of a vast variety of services provided via the Internet.

In this line, Internet experience for users is affected by many other elements, such as devices, operating systems, applications, app stores, or content that condition in some way or other user experience when accessing the Internet.

The aim of this report is to identify how the complete Internet value chain (both on the network layers and electronic communication services supporting Internet access, and beyond these layers) is affected by some players on multiple levels (competition, innovation, investments, open internet, users' choice and experience). BEREC will aim to identify these key players on different levels, perform an initial analysis on the role played by these players and analyse the effects of their practices. As a result, BEREC will also identify potential bottlenecks and parts of the value chain affecting each other economically and technically (and especially, but not only, those affecting the elements of the chain in the regulatory scope for BEREC).

The work to be done will build on previous reports and will feed into further BEREC work on digital environments, including the implementation of the Digital Services Act package.

7. Potential work for 2022 and beyond

In addition to the items described above the items in this section will be considered for the Work Programme 2022 and beyond in future work programmes. The list of items mentioned below is exemplary and is not a final list. BEREC will also consider other new workstreams for 2022, including those that will be brought forward by stakeholders in the different consultation phases. The list of project deliverables will be defined during the preparation of the 2022 work programme over the course of 2021.

Multiple regional operators of NGA-networks

A factual investigation of the level of competition between multiple VHCN/NGA regional operators' dependent on degree of network overlap, business strategies and other relevant factors for competition. Regional operators of NGA-networks play an increasingly important role on the broadband market in many countries. This factual investigation will look into how competition play out dependent on different market characteristics.

Operators may partly overlap. In areas where operators do not overlap but they could still be very close to each other (within same region, area, city, neighbourhood) and could maybe more easily start to cover each other's coverage area. Some operators might have "scattered" networks across the country and compete with many other operators throughout the country (e.g. coax vs. fiber). Operators might use different business strategies – to differentiate prices across their networks dependent on presence of other operators or not to differentiate prices.

The factual investigation could be the starting point of how this is handled in the context of SMP-analysis.

Compensation in the case of early termination of contracts

Compensation in the case of early termination of contracts with a specific focus on the recoverable costs, and invoicing methods prescribed domestically for retail pricing (such as the possibility for the customer to pay one-off fees e.g. activation fees, split over different monthly invoices).

Workshop BEUC and BEREC implementation end-user provisions

According to Article 123 of the EECC, BEREC must publish an Opinion by 21 December 2021 on the market and technological developments and on their impact on the application of rights of end-users in the EECC (Title III of Part III). This will serve as an important input for the Commission's Report on the application of Title III of Part III ('End-user rights') and its legislative proposal to amend that Title.

A joint workshop could be based on the implications of the possible outcome of the review of the end-user provisions.

Non-discrimination on quality of service (QoS)

Alternative operators that rely on wholesale access do not control most of the essential elements of the quality of the service provided. Ensuring non-discrimination with regard to quality of service (QoS) between wholesale access providers and access takers is therefore an interesting topic.

Monitoring and encouraging the transition to IPv6

With the current exhaustion of IPv4 addresses, it is becoming crucial for the future of IP communications that a fast and efficient transition to IPv6 is achieved. BEREC will continue to encourage and monitor the roll-out of this future-proof protocol.

Report on key elements of the functioning of the EECC

In line with BEREC's responsibility for monitoring the functioning of the EECC, one additional element would be to monitor the impact and effectiveness of the newly inserted provisions, with a view to collecting enough quantitative and qualitative data for future EECC reviews (as required under Articles 122-123).

Experience sharing on Implementation of Guidelines

The BEREC Guidelines stemming from the EECC need to be taken into utmost account by NRAs and Competent Authorities. There could be a specific workstream for dealing with experience sharing on the implementation of Guidelines.

Exchange on the impact of the Open Data and Public Sector Information Directive

In light of the adoption of the Open Data and Public Sector Information (PSI) Directive in June 2019, BEREC will consider to what extent it can support the goals of the Directive to support the provision of data for general business opportunities and other purposes, such as algorithm training.

State of Mobile roaming: 5G including cross network slicing

This request could be addressed by including specific questions on 5G in the benchmarking delivered by the roaming WG and the BEREC Opinions on the roaming review. Nevertheless, we would have to wait until the deployment of 5G is more advanced to be able to gather significant data.

Workshops on wholesale replicability test, IP peering

Workshop or exchange of experiences relating to wholesale replicability tests in order to compare and share European practices or proposals.

Workshop and exchange of information on NRAs' first experiences with regard to 5G city networks.

Workshop in cooperation with the Organisation for Economic Co-operation and Development (OECD) to examine ongoing trends in IP interconnection policies and practices.