

**BEREC response to the European  
Commission's Exploratory Consultation on the  
future of the electronic communications sector  
and its infrastructure**

**Annex to complement section 4 of the BEREC  
response**

19 May 2023

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## 1. Introduction

This annex provides additional information and clarifications related to the messages outlined in section 4 of *BEREC's Response to the Exploratory Consultation "The future of the electronic communications sector and its infrastructure"*. This document follows the structure of section 4 of the BEREC response.

BEREC is committed to continue the work on the issues raised in this consultation and has a number of relevant projects in its Work Programme 2023, including, a report on the IP-Interconnection (IP-IC) ecosystem<sup>1</sup>, which it will publish in 2024 after collecting relevant data. BEREC also looks forward to the EU Commission sharing the data it receives from this consultation, which will allow BEREC to carry out quantitative assessments that will facilitate a deeper understanding of the topics under discussion and, will use relevant data to substantiate its approach and explore any new options that may arise.

In this document BEREC focuses mainly on the mechanism of mandatory financial contributions from CAPs to ISPs, in the form of a sending party network pays (SPNP) regime and looks into possible impacts that this may have. Moreover, BEREC's analyses the topics mainly via an IP-IC approach, but notes that a more complete analysis could be performed regarding the entire internet ecosystem.

## 2. Gigabit society and the internet ecosystem

The issue of whether content providers should contribute to network costs is not new, and BEREC first examined these issues in 2012<sup>2</sup>. In its first contribution to the recent discussions, BEREC carried out a preliminary assessment on the underlying assumptions of payments from large content and application providers (CAPs) to internet service providers (ISPs)<sup>3</sup>.

In general, the questionnaire used by the Commission for the exploratory consultation is taking stock of the current state of the market for electronic communications and the regulations that apply and is seeking possible ideas to match the technological advances and the economic situation. The EU Digital Decade sets specific connectivity targets, which complements the objectives set out in the European Electronic Communications Code (EECC), which listed

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<sup>1</sup> Ref. project 2.8 in BEREC [Work Programme 2023](#) and other relevant projects impacting the Internet ecosystem, including project 1.2 "*BEREC study on the evolution of the competition dynamics of tower and access infrastructure companies not directly providing retail services*", project 2.5 "*Report on the entry of large content and application providers into the markets for electronic communications networks and services*" and project 2.12 "*External study on the trends and policy/regulatory challenges of cloudification, virtualisation and softwarisation in telecommunication*"

<sup>2</sup> [BoR \(12\) 130](#) An Assessment of interconnection issues in the context of net-neutrality

<sup>3</sup> [BoR \(22\) 137](#) BEREC preliminary assessment of the underlying assumptions of payments from large CAPs to ISPs

connectivity as one objective alongside competition and investment, the internal market and consumer empowerment.

As foreseen in the Digital Decade Policy Program (DDPP)<sup>4</sup>, the objective is to foster the digitalisation of the European economy and society by setting out four overall targets, which relate to deploying high-speed networks, improving the digital skills of the population as well as digitalising businesses and the public administration. The four areas of the DDPP are further complemented by the European Declaration on Digital Rights and Principles (the Declaration) and, Chapter II “Solidarity and inclusion”, states a commitment to “...*developing adequate frameworks so that all market actors benefiting from the digital transformation assume their social responsibilities and make a fair and proportionate contribution to the costs of public goods, services and infrastructures, for the benefit of all Europeans*”. Currently, different players contribute in different ways to the internet ecosystem: for example, some players provide access networks, backbone networks, submarine cables, others digital infrastructures such as content delivery networks (CDNs) or IP transit services, others content, applications and services, and others again provide digital skills, or a combination thereof. All players invest, and thereby partake, in the digitalisation of society and the economy. This should be reflected when considering any policy option.

Moreover, in the Declaration, the fair and proportionate contribution to the costs not only applies to infrastructure but also to other public goods and services. The data requested in the questionnaire seems to focus on investment in connectivity, while also seeking qualitative input on the role of Universal Service, barriers to the single market and the impact of technological developments.

The questionnaire seeks answers to questions on direct network contributions and alternative funding mechanisms but BEREC would assume that the introduction of any such intervention would be preceded by a finding that the market is failing to generate an efficient outcome (i.e. charging excessive prices, generating excessive profits to the detriment of end-users, lack of investments) and that there is a lack of competition.

Finally, BEREC refers to the findings of its preliminary assessment, that “*fixed access networks costs exhibit a very low traffic-sensitivity, while mobile networks experience some degree of traffic-sensitivity*”.<sup>5</sup> However, using relevant data that the EU Commission might gather through the consultation, BEREC will assess further any relationship between the growth of data traffic volume and the level of investments that must be made to reach a gigabit society.

➤ The whole internet ecosystem should be accounted for when considering policy options, as reflected in the Declaration and the DDPP.

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<sup>4</sup> [https://ec.europa.eu/commission/presscorner/detail/en/ip\\_22\\_4503](https://ec.europa.eu/commission/presscorner/detail/en/ip_22_4503)

<sup>5</sup> BoR (22) 137, preliminary finding nr. 7.

- Currently, actors contribute in different ways to the internet ecosystem: some for example provide access networks, others digital infrastructures or IP transit services, others content, applications and services, and others again provide digital skills, or a combination thereof.
- There is only a limited relationship between data growth and the level of investments that must be made to reach a gigabit society and meet the purported increasing network costs. BEREC is looking forward to receiving the data gathered by the EU Commission through this consultation, which will allow for further quantitative assessment of its positions on the aforementioned matters (cost drivers, etc.)

### 3. Gigabit connectivity for all deserves targeted solutions

BEREC holds that any regulatory intervention requires a proper justification. Currently, (paid) peering is based on commercial negotiations. A refusal to pay interconnection charges *per se* is not considered to be a case of market failure<sup>6</sup>.

As the current debate is related to reaching the connectivity targets, it is worth looking at the situation of gigabit coverage. The national coverage of households with at least 1 Gbps download ranges between 1% and 100% across the countries of the EU27 at the end of 2021, and some countries already register considerable progress. The shares therefore differ to a large extent by country<sup>7</sup>, indicating the relevance of country-specific factors in relation to the deployment of high-speed internet access. Therefore, the following description of important factors for reaching the connectivity targets does not apply equally to each country.

The key for high growth of coverage are private investments. A report for the European Commission (EC) finds, that “*industrial and financial investors have developed a strong appetite for digital infrastructures*”.<sup>8</sup> The report highlights that investment capital has been available, which for a large part has flown into access networks, a situation amplified by the Covid-19 crisis and global savings glut. The increase in access network investments seems to support the idea that these are stable investments with an attractive risk-return ratio.<sup>9</sup> This

<sup>6</sup> A market failure may occur in the case of, for instance, information asymmetries and externalities.

<sup>7</sup> Broadband Coverage in Europe 2021 – Mapping progress towards the coverage objectives of the Digital Decade, [A study prepared for the European Commission DG Communications Networks, Content & Technology](#) by HIS Markit, OMDIA and Point Topic, page 50 of the final report,

<sup>8</sup> “Investing in local and regional Gigabit broadband deployment – Opportunities and challenges for market investors in the EU” (March 2022), [A study prepared for the European Commission](#) DG Communications Networks, Content & Technology by Visionary Analytics, CBO Consulting and IDATE,

<sup>9</sup> “Because of a global saving glut and the Central Banks expansionary policies, financial markets have been fuelled by large market liquidities while at the same time, fibre was increasingly considered as a future-proof technology, turning now digital into a “core infrastructure asset”. In the last 2 years, COVID crisis has even amplified the phenomenon making digital an essential infrastructure, often called the ‘4th utility’ by investors. The large vertically integrated historical players (Telcos) having now to cope in the short term with massive investments (FTTH, 5G and for the incumbents, copper termination), it creates numerous and substantial market opportunities for challengers/startups in a large industry transformation”, p.9, <https://digital->

trend can be observed in some Member States.<sup>10</sup> Therefore, public funding at local, national, or European level is used to trigger (additional) or complement private investments, and promote coverage of underserved areas. In general, crowding out private investment with other investments should be avoided. Independent of the availability of funding, it is clear that network deployment faces a variety of situations across the Member States.

The report for the EC furthermore identifies the administrative processes (e.g., for building permits, roadwork authorisations and subsidy granting) and the availability of information (e.g., to municipalities, investors, and operators) as major bottlenecks for the deployment of VHCN.

Further bottlenecks could arise in the form of a scarcity of construction capacity and required real estate (e.g., access to suitable sites for mobile deployment), as well as lack of consumer demand (e.g., when current infrastructure suffices to meet the needs of consumers). Such bottlenecks are addressed in the Broadband Cost Reduction Directive<sup>11</sup>, which is being currently revised in the proposal of the Gigabit Infrastructure Act<sup>12</sup>.

To this end, it is questionable that mandatory payments from CAPs to ISPs would lead to Member States meeting the connectivity targets. In this context, BEREC points out that mandatory payments from CAPs to ISPs could not ensure that additional funds (if needed) go to countries/areas which are currently undersupplied. On the contrary, it is rather likely that ISPs in already well supplied areas would benefit the most.<sup>13</sup> In areas where the rollout of VHCN is not profitable, the availability of private capital to invest and its cost will not be a determining factor for the achievement of the rollout. In these areas, other sources of funding, notably public funds, are mobilised to achieve the connectivity targets.

Recent reports by WIK<sup>14</sup> and ACM<sup>15</sup> find generally competitive conditions in the IP-interconnection markets. Interconnection data collections conducted by some NRAs at national level show the same findings.<sup>16</sup> BEREC is currently not aware of structural

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[strategy.ec.europa.eu/en/library/study-investing-local-and-regional-gigabit-broadband-deployment-opportunities-and-challenges-market](https://strategy.ec.europa.eu/en/library/study-investing-local-and-regional-gigabit-broadband-deployment-opportunities-and-challenges-market)

<sup>10</sup> For example, in France, 57% of the population are attributed to areas, which are covered by strictly private investments where investments are intended to be economically sustainable. For the remaining 43% of the population, connections are intended to be provided by public initiative networks financed through public and private investments (public/private partnerships in the form of public service outsourcing or partnership agreements). See

[https://www.strategie.gouv.fr/sites/strategie.gouv.fr/files/atoms/files/synthese\\_thd\\_2023\\_eng.pdf](https://www.strategie.gouv.fr/sites/strategie.gouv.fr/files/atoms/files/synthese_thd_2023_eng.pdf), p.18.

In Germany, 90% of fibre deployment was financed by BREKO members as commercially viable projects and 10% required state aid. See [Contribution of BREKO to the public consultation on the draft BEREC Guidelines on the Implementation of the Open Internet Regulation](#).

<sup>11</sup> [Directive 2014/61/EU of the European Parliament and of the Council of 15 May 2014 on measures to reduce the cost of deploying high-speed electronic communications networks](#)

<sup>12</sup> <https://digital-strategy.ec.europa.eu/en/library/gigabit-infrastructure-act-proposal-and-impact-assessment>

<sup>13</sup> This holds as a mandatory payment will not turn an unprofitable area into a profitable area.

<sup>14</sup> Competitive conditions on transit and peering markets,

<https://www.wik.org/en/veroeffentlichungen/studien/weitere-seiten/transit-and-peering-markets>

<sup>15</sup> ACM (2021): [Study into the Market for IP interconnections 2021](#)

<sup>16</sup> ARCEP (2022): [Barometer of data interconnection in France](#)

interconnection problems in relation to growing volumes of traffic attributed to the CAPs.<sup>17</sup> In the past, BEREC found that interconnection agreements were typically concluded without regulatory intervention, and called for a careful approach when considering whether regulatory intervention is actually warranted.<sup>18</sup> BEREC also considers that the Internet ecosystem has managed to adapt IP-interconnection arrangements to changing conditions, such as the increasing traffic volume.<sup>19</sup>

Furthermore, BEREC is currently carrying out an assessment of the IP-interconnection ecosystem<sup>20</sup> and will have regard for factors that drive traffic volumes, such as real time events (sports, concerts). BEREC will also conduct further and deeper analysis, when it has access to any relevant data gathered through the exploratory consultation.

BEREC notes that the exploratory consultation may provide insights on the data flows between CAPs distribution networks and ISPs electronic communication networks and services, which may suggest a possible dispute-resolution role for NRAs between CAPs and ISP as well as the need for regular and long-term market monitoring through relevant data collection (e.g., environmental impacts of the digital sector, investments in digital infrastructures, IP traffic volumes).

- BEREC holds that any regulatory intervention requires a proper justification.
- Private investment is key for network deployment, providing for the value of market-driven solutions. In addition, public funding at local, national, or European level is used where necessary to trigger (additional) or complement private investments and promote coverage of underserved areas. While there is no general lack of funds regarding network deployment, the situation may vary across the Member States.
- It is uncertain whether mandatory payments would be utilised by ISPs to specifically target areas which are currently lagging behind.
- Administrative processes (e.g. for building permits, roadwork authorisations and subsidy granting), the availability of information (e.g. to municipalities, investors and operators), lack of consumer demand (e.g. when current infrastructure suffices the needs of consumers), scarcity of construction capacity, and required real estate are important (if not the most important in many Member States) obstacles hampering the rollout of VHCN.
- In the past, BEREC found that interconnection agreements were typically reached without regulatory intervention and called for a careful approach when considering whether regulatory intervention is actually warranted. Also, recent reports find

<sup>17</sup> [BoR \(22\) 137](#), chapter 5.

<sup>18</sup> [BoR \(17\) 184](#) BEREC Report on IP-Interconnection practices in the Context of Net Neutrality (), chapter 7, conclusion (i).

<sup>19</sup> [BoR \(22\) 137](#), chapter 1.

<sup>20</sup> See also the [BEREC Work Programme 2023](#), Section 2.8.

generally competitive conditions in IP-interconnection markets. There is no evidence of a competition problem or a market failure to the detriment of end-users regarding IP-interconnection.

- BEREC recognises a potential dispute-resolution role for NRAs between CAPs and ISPs as well as the need for regular long-term market monitoring through relevant data collection and remains ready to contribute to this regard.

## 4. Points of attention related to mandatory financial contributions from CAPs to ISPs

BEREC has expressed reservations about mandatory financial contributions from CAPs to ISPs in the form of a sending party network pays (SPNP) regime and looks into possible impacts that this may have. Regarding other forms of contribution mechanisms (e.g., funding mechanism), concerns may arise, but any proposed functioning would have to be assessed in detail and BEREC remains available to contribute to the evaluation of any material proposal that may arise. BEREC notes that such other contribution mechanism would also need to be objectively justified, with clearly defined targets. BEREC describes below the issues that should be included in the analysis of possible regulatory interventions (in the event that a need to intervene is identified).

### 4.1. Competition

A mandatory financial contribution from CAPs to ISPs may have a number of impacts on competition.

A mandatory payment from CAPs towards network operators might be disadvantageous for small ISPs (versus larger ISPs) due to them having less economies of scale and bargaining power. Transaction costs for ISPs and CAPs in negotiations of peering conditions can lead to an advantage for large ISPs (e.g., when content is placed on their network) and CAPs. Additionally, the size and value of the termination monopoly of ISPs can increase (*ceteris paribus*) with the number of end-users the ISPs have on their network, resulting in a weaker position of small ISPs compared to large ISPs. Small ISPs may not be able to negotiate fees and conditions towards CAPs or other networks which are as favourable as large ISPs, distorting competition. If smaller ISPs have little option other than to peer with large ISPs (e.g. because CAPs do not peer directly with smaller ISPs or because internet exchange points (IXPs) lose relevance due to restrictive peering policies), the quality of the termination monopoly of large ISPs may change: large ISPs may charge smaller ISPs for access to content via paid peering or transit, requiring small ISPs to pay large ISPs to *receive* traffic.



Such payments might also be disadvantageous for small CAPs due to differences in bargaining power. Their bargaining power relative to ISPs with a certain termination monopoly is very little, as they have fewer levers than bigger CAPs (e.g., must-have products, possibility of commercial partnerships on their services). Moreover, smaller CAPs face comparatively high transaction costs to negotiate with every possible ISP on the market.

Furthermore, in the case of such payments, the termination monopoly of the ISPs is reinforced, therefore increasing the bargaining power for ISPs. ISPs may be in a position to discriminate and self-preference own services, if they are able to set or change the level of the termination fee, and the fee is not applied to their own services, for example the ISPs' own streaming or cloud services.

As in the South Korean case, a system that charges all CAPs with interconnection links within the country could create incentives for international CAPs to withdraw from interconnection points within the EU.<sup>21</sup> However, in some scenarios, even local CAPs would have the ability to relocate or establish new interconnections outside of the EU to avoid a payment.

In general, it is unclear how a mandatory payment from CAPs to ISPs affects (i) mobile virtual network operators (MVNOs), (ii) mobile operators with extensive sharing agreements, (iii) fixed operators which utilise wholesale agreements for parts of their access network, or (iv) ISPs which provide internet access via a provider of passive infrastructure. Channelling of the payment might be complex, as the ISP dealing with the incoming traffic at interconnection level might be different to the ISP terminating the traffic to the customer. Such a situation would require wholesale agreements to be re-evaluated, such as MVNO access offers or regulated wholesale reference offers. The implications for the various operators and providers are different, reflecting the diverse positions, business models and roles of the actors in the provision of internet access. In particular, firms or communities only investing in physical (fibre) infrastructure (leaving the operation of the network to other parties) will not benefit from interconnection charges paid by CAPs to ISPs. Therefore, in this case, the payment does not seem to incentivise deploying new infrastructure.

- A mandatory payment from CAPs to ISPs is likely to lead to competitive disadvantages for small ISPs and small CAPs.
- A mandatory payment from CAPs to ISPs is likely to increase the bargaining power of ISPs due to their market position regarding termination monopoly of traffic.
- With a mandatory payment from CAPs to ISPs, ISPs are likely to be able to discriminate and self-preference their own services (e.g., related to streaming or cloud).

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<sup>21</sup> WIK (2022): Competitive conditions on transit and peering markets, p. 36  
<https://www.wik.org/en/veroeffentlichungen/studien/weitere-seiten/transit-and-peering-markets>

- Considering the complex business models of operators and providers of internet access (e.g., MVNOs and providers of passive infrastructure), the payment may not incentivise the deployment of new infrastructure.

## 4.2. End-users

A mandatory financial contribution from CAPs towards network investments may impact on end-users<sup>22</sup> in different ways.

- *Possible effects on the price of content subscriptions*

CAPs may pass on higher costs to their customers via higher prices for content subscriptions. This would be similar to how companies pass on higher costs to their customers in times of high inflation. Thus, to the extent that costs are passed on following the introduction of such a financial contribution, this works against the aim of protecting end-users from paying more, in particular in times of high inflation. While end-users may react to such a price increase by terminating the content subscription or switching to a smaller CAP, which does not have to pay the contribution, this would imply (*ceteris paribus*) that the end-users' decision would differ from their welfare-maximising decision in a situation without a financial contribution.

- *Possible effects on the price of the internet access services (IAS)*

Assuming that the costs of IAS are fully covered by the customer payments, an additional payment from CAPs to ISPs would imply that costs are over-recovered. In that case, a financial contribution, especially via a "sending party network pays (SPNP)" regime, needs a thorough assessment in economic terms. A contribution might for instance be used for investment, but its utilisation would be uncertain. Furthermore, a non-profitable investment would remain non-profitable, even if a network operator/ISP had more financial means. It might also be possible that – depending on the degree of competition among ISPs – an excessive cost recovery is competed away, as prices for IAS might decrease (which would be beneficial for end-users). To the extent that the latter scenario would occur, it might turn out that the ISPs' revenue generated from a mandatory payment from CAPs are offset by corresponding revenue shortfalls due to a decrease of prices for IAS. The more pronounced such an offsetting effect would be, the less revenues would be generated to meet the connectivity targets.

Assuming, however, that the costs of IAS are not fully covered, would imply that there is a free-riding issue. However, BEREC notes in its preliminary assessment<sup>23</sup> that at present, BEREC is unaware of any evidence of free-riding.

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<sup>22</sup> According to the EECC, "end-user" means a user not providing public electronic communications networks or publicly available electronic communications services. In turn, "user" means a natural or legal person using or requesting a publicly available electronic communications service. On that basis, BEREC understands "end-user" to encompass individuals and businesses, including consumers as well as CAPs.

<sup>23</sup> [BoR \(22\) 137](#)

- *Possible effects on business end-users (in particular small and medium enterprises (SMEs))*

The introduction of a mandatory payment from CAPs to network operators could also impact business end-users, in particular SMEs. This may happen when large cloud or CDN providers have to pay a financial contribution to network operators. Many business end-users employ services from CDN or cloud service providers. This holds in particular for SMEs.<sup>24</sup> But also content providers (streaming or gaming providers) or public services use cloud services.

Large cloud or CDN providers might pass-on their higher cost to their customers (be they SMEs, enterprises, gaming providers, public service providers etc.). This would affect all customers regardless of their size, which would contradict a possible limitation of a contribution to large CAPs only. Such a cost pass-on negatively impacts the competitiveness and commercial viability of all these customers.

SMEs may find it difficult to migrate from one cloud provider to another, especially when the services used are tailor-made for a customer or are not offered by smaller cloud providers. When SMEs and others are exposed to the risk of a cost pass-on, this may jeopardise the EU Digital Decade targets, which are to digitise European businesses by increasing the usage of cloud services, big data, and artificial intelligence (AI). Such issues however are meant to be addressed with the proposed Data Act regulation.

If a contribution only from large CAPs were to be considered, as set out below, this might either not be possible in practice, or may lead to issues of unequal treatment, and distort decisions stakeholders would have taken otherwise.

It may not be possible to limit the contribution to large CAPs only by excluding content from third parties, if it is not possible to distinguish whether content originally stems from a large CAP or not. This holds true, in particular, in cases where the traffic passed-on from CDNs to ISPs is encrypted. Even if such a distinction were possible, it would imply that a large cloud service/CDN provider's content is treated differently than third party content (also see section 4.4).

Additionally, exempting third party CDNs/cloud services (other than large CAPs) does not seem to be a viable option for several reasons. It would not only imply that CDNs or cloud services are treated (billed) differently depending on who provides them. Given that large CAPs may employ a multi-CDN strategy in practice – i.e., using their own CDN and also third party CDNs – in order to provide their own services, such a distinction would imply that the large CAPs' traffic is treated differently. Also, it would provide an incentive for large CAPs to use third party CDNs/cloud services instead of in-house CDNs/cloud services, to avoid the risk of a cost pass-on. This type of exemption would distort the competitive level playing field between CDN/cloud services provision by large CAPs vs. third parties.

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<sup>24</sup> [SAP](#) states that more than 250,000 of its customers are SMEs.

Furthermore, a mandatory contribution targeting large CAPs would require a clear and non-discriminatory distinction between these and all other CAPs. Depending on the Member State, the customers of public broadcasters, football streaming providers or others may also generate high traffic volumes. Moreover, defining a traffic volume to distinguish large CAPs from all others creates (*ceteris paribus*) misaligned incentives not to grow in order to avoid becoming a large CAP, thus having to pay a contribution.

- *Possible effect on QoS*

The length of the communication link is a key factor on the network performance. To reduce the length of this link, and thereby optimise performance (particularly latency), strategies such as edge computing, CDNs or on-net caches have evolved. The introduction of a regulatory regime on IP-interconnection might lower the incentive, e.g., to establish settlement free peering agreements<sup>25</sup>, direct interconnections or to use IXPs. The introduction of such a regulatory regime or economic incentives to not serve content from geographical locations near end-users might lead to *higher* latency and thus a degradation of the quality for end-users, in particular if content was moved outside the EU. Evidence can already be found in South Korea, where “*many Korean content providers cannot handle the higher cost for hosting their content in Korea and have either moved overseas or were outcompeted by foreign content providers because Korean firms cannot provide speed-intensive content, such as 4K video. As a result, Korean consumers are shifting to foreign content providers.*”<sup>26</sup>

While latency also puts a maximum on the bandwidth available to services<sup>27</sup>, its impact depends on the applications used. While e.g., video-streaming services are still working at good quality even with higher delays, due to the possibility of pre-fetching and buffering, the experience of real-time-applications, such as gaming, live-streaming or real-time voice/video applications, is greatly dependent on a low latency. Also, some innovative future applications might be affected, such as person-to-person-communication within virtual reality, or time-sensitive services requiring a high bandwidth. Besides real-time applications, even browsing the web is dependent on latency, as resources for accessing pages during browsing are transmitted at the time of request, leading to an increase of latency which has direct impacts on the browsing experience.

Even if CAPs are still operating services from within the EU, establishing an even stronger economic incentive to reduce the data volume used by services, might lower the quality of their content.

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<sup>25</sup> Viewed differently such a regulatory regime might increase the incentive for IAS providers to sell transit services rather than establishing a settlement free peering agreements. Given that transit involves connectivity to the whole internet (different from peering) the CAP would ultimately by a more comprehensive service (the CAPs want to reach the ISPs' customers rather than buying connectivity to the whole internet).

<sup>26</sup> <https://carnegieendowment.org/2021/08/17/afterword-korea-s-challenge-to-standard-internet-interconnection-model-pub-85166>

<sup>27</sup> The maximum bandwidth available for the widely-used Transmission Control Protocol (TCP) is determined by the Bandwidth-Delay-Product (BDP) that is influenced by the delay and packet-loss of the connection.

- A mandatory payment towards network providers may lead to higher prices for content subscriptions, when CAPs pass on higher costs to their customers.
- A mandatory payment, especially via a “sending party network pays (SPNP)” regime, from large CAPs could advantage network operators/ISPs, and its utilisation is uncertain.
- A mandatory payment could affect (*inter alia*) SMEs, if large CDNs and cloud services also had to pay and would pass-on higher costs to their customers.
- Trying to limit contributions to content from large CAPs only might either not be possible in practice or may violate the general non-discrimination principle and distort decisions and incentives not to grow (also see section 4.4).

### 4.3. Innovation

The basis for today’s diversity of internet-based applications and services lies in the end-to-end-principle, giving a neutral internet architecture. For the transmitters of traffic at the network layer, it is not possible to exclude applications provided at the endpoints of the network. The principle of net neutrality, which preserves this situation, fosters innovation since *any end-user* can implement content and applications in computers connected to the internet without asking ISPs for permission.

On the internet, every CAP can reach every user, and every user can at the same time provide content and applications. Changing the mechanisms for interconnection agreements may harm the current status of the internet in Europe. With an implementation of direct compensation for IP interconnection, the termination monopoly of ISPs gets reinforced and manifested. This could lead to a situation where the end-users do not decide about the content and the quality anymore. However, in such a situation, given the ISP’s termination monopoly, there would be a negative effect on the incentive for innovation by CAPs, which provide the services and applications for the use, management, or analysis of large amounts of data.

The introduction of regulated IP-interconnections may slow down this *innovation without permission* in many different sectors and in various ways. Digital economy can lead to an open and sustainable society, as is recognised by the DDPP.<sup>28</sup> To meet the four targets of the DDPP (outlined in chapter 2 above), the digital services should be encouraged in general. These targets would imply the development of new applications, which can create new opportunities for stakeholders and users. The draft AI Act<sup>29</sup> and draft Data Act<sup>30</sup> indicate the need to have

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<sup>28</sup> Proposal for a DECISION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing the 2030 Policy Programme “Path to the Digital Decade” ([COM/2021/574 final](#))

<sup>29</sup> Proposal for a Regulation of the European Parliament and of the Council laying down harmonised rules on artificial intelligence (Artificial Intelligence Act) and amending certain Union Legislative Acts ([COM/2021/206 final](#))

<sup>30</sup> Proposal for a Regulation of the European Parliament and of the Council on harmonised rules on fair access to and use of data (Data Act) ([COM/2022/68 final](#)),

a framework for the use of data that is being generated by AI applications and other applications and services. Thus, the DDPP decision explicitly provides for “[...] *the ability to process big data* [...]” and encourages the use of data. Traffic-based contributions seem to oppose this idea, however different scenarios may impact on innovation in different ways.

A contribution may reduce the incentives for CAPs to develop content and applications and may reduce the quality of existing services. Furthermore, if a mandatory payment from CAPs to ISPs leads to CAPs moving outside the EU due to high interconnection cost, this could reduce incentives for innovation into national and European content and applications. Furthermore, locating CAPs outside the EU leads to additional distance, and additional hops are introduced between the providers and the users. This may specifically reduce the incentive to innovate in QoS-sensitive content and applications.

Reduced innovation in content and applications might result in lower traffic development, which again slows down innovation in network infrastructures: networks are upgraded to higher speeds in the short run when the traffic exceeds the capacity, and then innovation of networks evolves into more efficient network technologies in the longer run. If traffic from content and applications does not stimulate such evolution anymore, the network technology will become less incentivised to be made more efficient.

If a mandatory payment was limited so that it is only applied to certain players, this may introduce a “ceiling” for newcomers in the market of content and applications. This may reduce the incentive to innovate since newcomers and other smaller CAPs may seek to avoid breaking through the “ceiling”, in order not to be categorised as “large” and become eligible for increased interconnection fees. Such a development would further strengthen the position of the large CAPs that are established, and more easily can afford to pay such fees since they do not need to fear upcoming competitors.

Large, well-established CAPs may be able to pay additional interconnection fees, which smaller CAPs may not be able to, contributing to cementing the status of the market for content and applications. Development of smaller CAPs is slowed down by such interconnection fees, and innovation becomes significantly hindered. Furthermore, if only large CAPs have to pay, smaller CAPs often rely on and use services of large CAPs, such as cloud computing, whereby these smaller CAPs may be affected by such interconnection regime in terms of higher prices for such services.

But also, the content and applications provided by the large CAPs could be affected by such a regulation. Future applications, like augmented reality/virtual reality (AR/VR), AI using large datasets or data science applications, may not be available for European customers – or only at higher prices.

- The principle of net neutrality fosters innovation, since any end-user can implement content and applications without asking the ISP for permission. Thus, the exploitation of the termination monopoly could lead to a decrease of innovation since ISPs are steering the selection of content instead of end-users.



- A mandatory financial contribution that is only applied to large CAPs, may have an impact on the content market. For example, smaller CAPs could have incentives to limit innovation to remain below the threshold of a “large traffic generator (LTG)”. This could in turn limit innovation of larger CAPs, as they may consequently have less competition from these smaller CAPs and be disincentivised from providing data-intensive applications by the contributions applied to large CAPs.

#### 4.4. Open internet

A mandatory financial contribution from CAPs to network investments may have an impact on the open internet in different ways.

EU rules dedicated to ensuring an open internet are enshrined in the Open Internet Regulation (EU) 2015/2120<sup>31</sup> (OIR). The legislative intent of the OIR is to both protect end-users and simultaneously foster the continued innovation of the internet ecosystem (recital 1 of the OIR). At its core, the OIR provides (in Article 3(1)) a guarantee of open internet access for end-users (including consumers and CAPs)<sup>32</sup>. Thus, end-users are all entitled to *access*, via their internet access service (IAS), all content, applications, and services as well as to *supply and distribute* them without restrictions. To ensure the effectiveness of the aforementioned end-user rights, the OIR lays down specific obligations (in Articles 3(1), 3(2) and 3(3)).

In addition to the provisions set out in the OIR, regard should also be had of:

- (a) the Declaration for the Future of the Internet<sup>33</sup> (DFI) where the EU pledges to uphold the net neutrality principles consistent with a vision of the internet that enables, inter alia, “*trustworthy, free, and fair commerce*” while “*avoid[ing] unfair discrimination between, and ensur[ing] effective choice for, users*”, and
- (b) the European Declaration on Digital Rights and Principles for the Digital Decade (the Declaration) where the EU committed to “*promoting and protecting a neutral and open Internet where content, services, and applications are not unjustifiably blocked or degraded*”.

If a mandatory payment was limited only to certain players (such as “LTGs”), it would go against the principle of net neutrality as set out in recital 1 of the OIR. This is because it involves treating traffic unequally, contradicting the principles of equal treatment and non-discrimination enshrined in Article 3(3) of the OIR.

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<sup>31</sup> [Regulation \(EU\) 2015/2120 of the European Parliament and of the Council of 25 November 2015 laying down measures concerning open internet access and amending Directive 2002/22/EC on universal service and users' rights relating to electronic communications networks and services and Regulation \(EU\) No 531/2012 on roaming on public mobile communications networks within the Union](#) (Text with EEA relevance)

<sup>32</sup> [BoR \(22\) 81](#) BEREC Guidelines on the Implementation of the Open Internet Regulation (BEREC OI Guidelines), paragraph 4

<sup>33</sup> <https://digital-strategy.ec.europa.eu/en/library/declaration-future-internet>

Given the case law of the European Court of Justice (ECJ) on zero tariff options, a distinction within internet traffic would likely breach the general non-discrimination duty laid down in the first subparagraph of Article 3(3) of the OIR<sup>34</sup>.

The OIR also entails a non-circumvention clause in recital 7. On this matter, guidance is provided by paragraphs 6, 37a and 49 of the BEREC OI Guidelines.<sup>35</sup> Otherwise, it would be possible to employ practices at the interconnection level that limit the exercise of end-user rights according to Article 3(1) of the OIR in the same way as applying non-application-agnostic throttling.

- The introduction of mandatory payments could limit the rights and obligations provided by Article 3(1) and 3(3) of the OIR to protect end-user's choice and to guarantee the continued functioning of the internet ecosystem as an engine of innovation.
- Unequal fees and imposing fees only to certain CAPs and not to others could also lead to such reduction of the range of available services and applications, and would probably not satisfy the general obligation of equal treatment of traffic, without discrimination or interference, pursuant to the first subparagraph of Article 3(3) of the OIR.

## 4.5. Resilience

Network resiliency is a critical factor for the **continuity of internet services**. Resilience is the ability of the infrastructure to withstand accidental or intentional operational failures / incidents and malicious cyber and physical attacks. Thus, it is important to consider the effects of a mandatory financial contribution on resilience.

BEREC notes that the imposition of a SPNP charging regime in South Korea (as of 2016) resulted in local content providers moving from South Korea to Japan and the USA because of better interconnection and hosting terms with foreign ISPs.

Taking that into account, it should be considered that CAPs (and ISPs) of any size may opt to disconnect from local interconnection points because of high domestic interconnection charges. This has implications on the resilience, stability, and performance of the interconnection ecosystem. The providers may have to rely more on transit than on direct interconnection. In particular, disruptions in international links may lead to detrimental effects

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<sup>34</sup> BEREC has taken from the ECJ's 2020 and 2021 rulings on the violation of the OIR that the general obligation to treat all traffic equally laid down in Article 3(3), first subparagraph OIR is not limited to technical traffic management practices but also applicable to other ISP practices, such as differentiated pricing. In the updated 2022 BEREC OI Guidelines, this interpretation has also been reflected in the Article 3(2) assessment (see, notably, paragraph 48, first bullet point).

<sup>35</sup> Paragraphs 37a and 49 of the BEREC OI Guidelines point out (and contain elements to underpin) that, typically, violations of Article 3(3) of the OIR will also limit the exercise of end-users' rights, thereby breaching Articles 3(2) and 3(1) of the OIR.



on quality, reliability, and availability of the internet services. In addition, traffic re-routing and utilisation of foreign hosting services may introduce higher end-to-end delays because of longer routing paths. This not only affects the QoS offered to the domestic end-users but may also result in an inefficient operation of the interconnection ecosystem, for all networks involved.

Network failures could be managed more easily and recovered in shorter times when the traffic is exchanged in local interconnection points, which implies a higher degree of redundancy. Currently, there are resilient interconnections between various market players (e.g., European IXPs, network operators), implying that alternative routing paths exist between the market players.

If for example more data were hosted outside a Member State, this might ultimately increase the risk for cyber-attacks threatening the confidentiality, integrity, and availability of the users' data. Attacks, such as Border Gateway Protocol and DDoS attacks, could lead to outages in critical national sectors.

Many questions arise which relate to the privacy policies of third countries that accept European data traffic. If the security guarantees were not equivalent to those in EU, the OIR provisions for the protection of personal data (recital 33 and Article 3(4)) as well as Article 100 of the EEECC would be violated.

- A direct contribution imposed on CAPs at the interconnection level could reduce direct peering and could cause internet traffic re-routing, far from local interconnection points, degrading thus the performance and the resiliency of the interconnection ecosystem to cyber-attacks.
- Data protection issues could occur due to re-routing the internet traffic via administrative domains outside the EU.