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Comments on Sweden's current and future connectivity challenges

Introduction

The Motion Picture Association (MPA) represents the interests of major international producers and distributors of film and television content. Our members include Netflix, Paramount Pictures Corporation, Sony Pictures Entertainment Inc, Universal City Studios LLC, Walt Disney Studios Motion Pictures and Warner Bros. Discovery. We serve as the global voice and advocate of the international film, television, and streaming industry. Our members work in most territories around the world, and as such are deeply engaged with both the regional and national audiovisual sector communities. MPA member companies produce and distribute a wide range of European and international film and television content in the European Union.

We welcome the opportunity to share our views on the current and future connectivity challenges in Sweden, and the broader European landscape. In this document, we highlight how the interplay between online content services and operators of electronic communications networks and services fosters connectivity infrastructure demand, and explain ways in which the former already contribute substantially to making networks more efficient. We will examine how infrastructure creates development opportunities, and in particular how the dynamic and flexible working of the internet of today is prepared to address technological and consumption evolutions of tomorrow, while providing input on the growing discussion being held at the EU level around "network fees".

We use the term "network fees" to mean any resulting mechanism that would see a fee paid by content and application providers (CAPs) directly or indirectly to providers of electronic communications networks (ECNs) for the claimed purpose of increasing investment in the network infrastructure. As such, for the purpose of our submission, "network fees", includes any system resulting in direct payments from CAPs to providers of ECNs, indirect payments which would be collected by a fund or any other vehicle and be distributed to providers of ECNs, or any other mandated method which would yield the same result of transferring wealth from CAPs to providers of ECNs for the purpose of supporting the latter's network infrastructure investment.

MPA understands and supports the importance of a strong telecom infrastructure and availability of high-speed internet access, which allows for the high-quality distribution of content to a wide and diverse audience, however, any network fees regime would fundamentally change the way the internet works. Additionally, network fees would raise consumer costs and compound existing financial obligation requirements applicable to media services regulated under the Audiovisual Media Services Directive (AVMSD), again to the detriment of the consumer.

Future developments will have significant impact on what internet usage will look like. The internet is a living, breathing organism which should not be regulated based on a snapshot in time. As Oxera noted in their 2023 study¹, “transitions to new technologies (in the broadest economic meaning of the word ‘technology’) are not instantaneous, and policy makers must be careful not to discourage activities with one hand which they are trying to encourage with the other”. The future is one of promise, and every member of the ecosystem has an individual and distinct role to play. Technological advances can help providers of ECNs develop more flexible, scalable infrastructure, which becomes more easily manageable and adaptable to market evolutions. They will also reduce costs across networks, including by reducing physical infrastructure, lowering costs of deployment, operation (including power consumption), maintenance, and upgrades. The flexibility offered will be crucial as new internet usage paradigms emerge, with VR/AR/XR set to shift where, when, and how data is consumed on the one hand, and IOT set to cause an explosion in the number of connected devices on the other. The internet as it stands now is prepared to address technological and consumption evolution.

In the following document, we will show that:

- There is no market failure preventing the development of performant, sustainable digital infrastructure in the Sweden - and while video on demand and online entertainment help drive demand for connectivity, network fees would disproportionately burden the already highly regulated audiovisual sector and European cultural content creation.
- Network fees are based on incorrect assumptions, would distort the internet ecosystem, and have detrimental consequences; the use of ‘Large Traffic Generators’ would be a flawed, unfair, and disproportionate basis for any such mechanism. It would simply be a value transfer with certain companies asked to subsidize the operations of others.
- The market for interconnection is competitive and functions well, with the example of South Korea serving as a cautionary tale against the Sending Party Network Pays (SPNP) principle. Critically, CAPs and ECN providers are already incentivized to cooperate and deliver content efficiently and sustainably to end users.

Our submission addresses the issues raised in the consultation in a holistic way, looking at the state of the ecosystem and landscape, and juxtaposing it with the issues of concern. In relation to the consultation topics, we have identified the issues addressed in the relevant sections in the table below:

MPA Submission	Consultation topic
<p>Section 1(a): The demand for connectivity in the EU is driven by consumer demand for many services, including for online entertainment – demand for online services should be encouraged</p>	<ul style="list-style-type: none"> • Use of connectivity and participation • Access to digital infrastructure
<p>Section 1(b) Network fees would not have a positive impact on investment in infrastructure nor help achieve the 2030 Connectivity Targets, and would likely harm competition, entrench</p>	<ul style="list-style-type: none"> • Use of connectivity and participation • Prerequisites for expansion of digital infrastructure • Competitiveness

¹ Oxera (2023) “Proposals for a levy on online content application providers to fund network operators - An economic assessment prepared for the Dutch Ministry of Economic Affairs and Climate”. 30 January 2023, p.38 [online]. Available at: <https://open.overheid.nl/documenten/ronl-8a56ac18a98a337315377fe38ac0041eb0dbe906/pdf>

the market power of incumbent providers and distort market incentives	
Section 1(c) Charging Large Traffic Generators (LTGs) is a misguided approach, with a flawed basis, and traffic is an irrelevant cost factor	<ul style="list-style-type: none"> • Use of connectivity and participation • Competitiveness
Section 2(a) CAPs are already incentivized to deliver content to end users as efficiently as possible	<ul style="list-style-type: none"> • Climate, sustainability and resource efficiency • Robustness and safety
Section 2(b) The market for interconnection is competitive and well-functioning & Section 3(c) South Korea exemplifies the adverse effects of network fees	<ul style="list-style-type: none"> • Competitiveness

Section 1(a): The demand for connectivity in the EU is driven by consumer demand for many services, including for online entertainment – demand for online services should be encouraged.

The symbiotic relationship between internet connectivity and the services available online creates a virtuous cycle that fuels innovation and economic growth in this sector. As technology evolves, new and innovative services are developed that lead to a further increase in demand for connectivity. This relationship between services and connectivity is dynamic and responsive to market demands, driving investment and innovation. The GSMA² indicates that demand for mobile connectivity is “driven by a combination of factors, including video streaming and online gaming”. Indeed, the use of video services, and especially the demand for high-definition content, is one of the reasons why end customers are demanding faster bandwidth speeds. Among other factors, access to high quality VOD services enables ECN providers to promote higher-bandwidth tariffs. Complemented by digitization and new offerings in healthcare, education, government, banking, and other services, it is the success of the CAPs that lies at the heart of increased demand for broadband access.

Some MPA members have individual commercial partnerships (in the space of resale and bundles for example) with ECN providers in the EU that bring well-recognized mutual benefits. For users, these bundles simplify subscriptions and give access to discounts. For VOD services, they bring more members or subscribers, and for ECN providers they bring additional revenue in the form of a commission and enable the sale of faster connectivity or more generous data packages³. Given the EU’s prioritization of connectivity targets, demand for online services should be encouraged by policymakers as this will ultimately result in an uptake of connectivity^{4 5 6}. Critically, these policies

² The Mobile Economy 2023”. 2023 [online]. Available at: <https://www.gsma.com/mobileeconomy/wp-content/uploads/2023/03/270223-The-Mobile-Economy-2023.pdf>

³ Examples include Voo and Orange in Belgium, Vodafone in Greece, Vodafone in Ireland, and more. See Annex for pictures.

⁴ The FTTH Council for Europe predicts that by 2027, Fiber to the Home/Business (FTTH/B) coverage will extend to 199 million households in EU27+UK. However, the take-up rate for such connections is expected to be only 62%, meaning that 38% of Europeans may choose not to subscribe. FTTH Council (2022). “Forecast for EUROPE Market forecast 2022-2027” FTTH Council. 2022 [online]. Available at: https://www.ftthcouncil.eu/Portals/1/PDF/FTTH_Forecast_for_Europe_2022-2027.pdf

⁵ In terms of wireless networks, the European Commission’s 5G observatory reported that while 72% of the EU population is covered by at least one 5G network in 2022, only 31 million people have subscribed, resulting in a take-up rate of approximately 1%. European Commission, Directorate-General for Communications Networks, Content and Technology (2022) “5G Observatory Quarterly Report 17 October 2022”. [Online] Available at: <https://5gobservatory.eu/wp-content/uploads/2022/10/QR-17-Final-v3-CLEAN.pdf>

⁶ The GSMA predicts that global 5G adoption will overtake 4G in 2029, but in Europe, 5G subscriber adoption is only expected to reach 87% by 2030. GSMA (2023) “The Mobile Economy 2023”. 2023 [Online]. Available at: <https://www.gsma.com/mobileeconomy/wp-content/uploads/2023/03/270223-The-Mobile-Economy-2023.pdf>

should not have the unintended consequence of reducing the diversity, quality or affordability of the content that drives this demand.

Section 1(b): Network fees would not have a positive impact on investment in infrastructure nor help achieve the 2030 Connectivity Targets, and would likely harm competition, entrench the market power of incumbent providers and distort market incentives.

Currently, efficient market structures and competition drive connectivity supply in the EU. These policy levers are demonstrated by the broad disparity in investments in next-generation networks among member states. The performance of countries leading in high fiber to the home (FTTH) deployment demonstrates that financing is not necessarily a bottleneck to achieving a high level of FTTH infrastructure, and that there is sufficient private investment capital and many financing institutions available to finance FTTH projects. For example, significant divergences between EU Member States in FTTH coverage exist⁷ - with some countries including Sweden, Spain and Lithuania scoring above 75%, while others, such as Italy, Greece and Germany have rates below 10%. This is a clear indication that policy measures and successful case studies already exist⁸ for successfully rolling out next generation networks, without the need for additional regulations like network fees. Moreover, one of the reasons why certain countries lag behind in FTTH deployment is that incumbent providers of ECNs were latecomers in fiber investment in those countries, with prominent examples being Germany and Italy. In these countries, the incumbents seemingly prioritized making returns on copper network infrastructure and began to invest more heavily in fiber deployment only when smaller entities such as local and regional operators and new entrants made significant steps to roll-out fiber. The experience of the leading fiber countries shows that nationwide coverage needs a certain period of time.

Additionally, as explained by Chen and Chen⁹ and highlighted in the 2023 Oxera study¹⁰, “cash payments from CAPs are unlikely to significantly reduce the required cost of capital to finance such investments, as that depends on the risk-free rate in the market, the required returns to equity and debt investors. There’s no reason to believe that any of these things would significantly fall as a result of network fees. The recent empirical literature finds that the relationship between cash flow and investment is near zero”. Therefore, CAPs giving extra capital to providers of ECNs would not necessarily have a positive impact on achieving the EU’s connectivity targets.

Notably, the German Monopolies Commission issued a policy brief on network fees in May 2023¹¹ in which it concluded that the idea of a financial contribution from datatraffic-intensive OTT providers to

⁷ OECD. “Broadband networks of the future” [online] OECD iLibrary. 2022. Available at: https://www.oecd-ilibrary.org/science-and-technology/broadband-networks-of-the-future_755e2d0c-en

⁸ OECD. “Broadband networks of the future” [online] OECD iLibrary. 2022. Available at: https://www.oecd-ilibrary.org/science-and-technology/broadband-networks-of-the-future_755e2d0c-en

⁹ Chen, H. J. and Chen, S. J. (2012), ‘Investment-cash flow sensitivity cannot be a good measure of financial constraints: Evidence from the time series’, *Journal of Financial Economics*, 103:2. February 2012, pp. 393–410. Available at: <https://www.sciencedirect.com/science/article/abs/pii/S0304405X11001929>

¹⁰ 1 Oxera (2023) “Proposals for a levy on online content application providers to fund network operators - An economic assessment prepared for the Dutch Ministry of Economic Affairs and Climate”. 30 January 2023, p.38 [online]. Available at: <https://open.overheid.nl/documenten/ronl-8a56ac18a98a337315377fe38ac0041eb0dbe906/pdf>

¹¹The German Monopolies Commission finds that (a) New conditions in peering and transit markets do not legitimize a cost contribution for network expansion, because it is not apparent that OTT providers are abusing their increased bargaining power there in a harmful manner. (b) There are no indications that a redistribution mechanism between OTT providers and network operators could improve the market situation. At the same time, such an intervention could cause distortions of competition. (c) Sufficient financial resources are available for fixed-network and mobile network expansion. Monopolkommission (2023). Policy Brief zur Frage nach einem Beitrag datenverkehrsintensiver Over-The-Top-(OTT)-Anbieter an den Netzausbaukosten der Telekommunikationsnetzbetreiber. [online] Available at: https://www.monopolkommission.de/images/Policy_Brief/MK_Policy_Brief_12.pdf

network expansion costs must be rejected. Obliging content providers to pay network fees would distort market incentives in a number of ways, to the detriment of end users and efficiency in the networks and economy as well as to the detriment of network quality (i.e., latency) and resilience. For example, to compel a content provider to pay network fees (in the case of a direct payments regime), an ISP could be incentivized to leave traffic congestion on its network unaddressed or to limit performance by design, effectively restricting end users from receiving the requested traffic from the content provider. Such an exploitation of the termination monopoly to levy network charges could distort competition in the content market. In this context, it is worth noting that many providers of ECNs are in direct competition with content providers for video streaming¹².

A network fee in any form would create disincentives for ECN providers to make their own investments in infrastructure or find market driven solutions. Instead, it would lead providers of ECNs to rely on these network fees to subsidize their infrastructure development – this could have a distortive effect as different ECNs may receive different amounts of network fees. Additionally, this could indeed slow, rather than increase, the pace of infrastructure development.

Section 1(c): Charging Large Traffic Generators (LTGs) is a misguided approach, with a flawed basis, and traffic is an irrelevant cost factor.

The suggestion for network fees is based on claims that a small number of leading CAPs are responsible for most of the data traffic growth in the last decade. Some ECN providers argue that the large CAPs are causing the increase in data traffic, which results in higher costs that they want to be remunerated for. However, we have seen larger growth rates in the past and traffic-related costs are currently declining¹³.

The argument that traffic is "caused" by CAPs has been refuted by the Body of European Regulators for Electronic Communications (BEREC) since 2012¹⁴, which stated that the data flow request comes from the retail Internet access provider's own customers, who request content provided by the CAPs, and from whom the ISP is already deriving revenues. This approach is also supported by the 2023 Oxera study¹⁵ and also aligns with EU legislation¹⁶, which defines an "Information Society service" as "any service normally provided for remuneration, at a distance, by electronic means and at the individual request of a recipient of services". BEREC also finds that the argument about traffic asymmetry is frequently raised in the debate about the Sending Party Network Pays (SPNP) principle, but that it does not seem to be in line with the actual behavior of ECN providers as they tend to build

¹² Netopia (n.d.) "Network Fees and the Creative Sector" Netopia [online] Available at: <https://www.netopia.eu/network-fees-and-the-creative-sector/-ip-carousel-5443>

¹³ Abecassis, D., Kende, M., Osman, S., Spence, R. and Choi, N. (2022). "The impact of tech companies' network investment on the economics of broadband". Analysis Mason. October 2022 [online] Available at: <https://www.analysismason.com/contentassets/b891ca583e084468baa0b829ced38799/main-report--infra-investment-2022.pdf>

¹⁴ BEREC (2022) "BEREC preliminary assessment of the underlying assumptions of payments from large CAPs to ISPs". 7 October 2022 [online]. Available at: [https://www.berec.europa.eu/system/files/2022-10/BEREC BoR %2822%29 137 BEREC preliminary-assessment-payments-CAPs-to-ISPs_0.pdf](https://www.berec.europa.eu/system/files/2022-10/BEREC%20BoR%2822%29%20137%20BEREC%20preliminary-assessment-payments-CAPs-to-ISPs_0.pdf)

¹⁵ Oxera also supports the argument that traffic does not originate with CAPs, saying that "...when considering the full set of relationships between consumers and CAPs, it would seem wrong to suggest that CAPs cause the traffic. The traffic is typically caused by a consumer. For example, the streaming of music or a film occurs because the consumer sent a request to the CAP to send them the film. The CAP then obliges. The cause of the traffic is the consumer's initial request rather than the CAP's fulfillment of that request." Oxera (2023) "Proposals for a levy on online content application providers to fund network operators - An economic assessment prepared for the Dutch Ministry of Economic Affairs and Climate". 30 January 2023, p.21 [online]. Available at: <https://open.overheid.nl/documenten/ronl-8a56ac18a98a337315377fe38ac0041eb0dbe906/pdf>

¹⁶ European Commission (2015) "Directive 2015/1535 - Procedure for the provision of information in the field of technical regulations and of rules on Information Society services (codification)" Article 1(1) lit, 2015.

networks to receive more traffic than they send. The concept of charging LTGs overlooks the significant diversity of internet data flows. The definition seems to rely on a 2022 Sandvine report¹⁷. However, this report failed to differentiate between various markets, fixed and mobile networks, and peak and average usage.

These distinctions are critical since they skew towards global players, fixed broadband, and often-used services, thereby erasing local players and peak events that are the actual drivers of network dimensioning. Additionally, the costs of interconnection expansion depend on the peak times, not on aggregated transmitted traffic nor on the origin of traffic. Consumers request data – CAPs do not “emit” data.

Furthermore, the recently held European Commission exploratory consultation on “The future of the electronic communications sector and its infrastructure” refers to The European Declaration on Digital Rights and Principles¹⁸, which seeks a fair and proportionate contribution to public goods and sets the benefit of digital services as a base consideration for such a contribution.

Firstly, it is important to note that internet connectivity services are offered by private for-profit companies for a fee. As such, it is clear that providers of ECNs do not offer connectivity services as a public good, and it is also not evident how network infrastructure is a public good – making the application of the Declaration inappropriate for the consideration of network fees. Moreover, there is no direct correlation between traffic and revenue (or benefit) for CAPs.

While video streaming constitutes the largest share of user data consumption¹⁹, most online revenues are generated by other activities such as advertising and e-commerce. To illustrate how disproportionate it would be for direct-to-consumer video services to be targeted on the basis of user demand for this content we must look at the benefit derived from the network infrastructure, most of which is to a variety of other services. Video accounts for only 2% of online services’ revenues, while 87% of direct internet revenue is attributable to e-commerce and search²⁰. Indeed, the use of the term CAPs is too broad in this respect, and equating traffic volume with the level of benefit that different market actors derive from their use of digital infrastructures is an unfair and disproportionate approach.

Traffic and usage-related costs have not grown over the last years and are not expected to grow over time. This is due to a combination of technological progress, which serves to reduce the amount of data required to deliver the same content, and cooperation between ECN providers and content providers in areas such as caching. In reality, transit prices are actually falling²¹. Cost reduction is in a

¹⁷ Phenomena (2022) “Growing app complexity: Paving the way for digital lifestyles and immersive experiences”. The Global Internet Phenomena Report. January 2022 [online]. Available at: https://www.sandvine.com/hubfs/Sandvine_Redesign_2019/Downloads/2022/Phenomena_Reports/GIPR_2022/Sandvine_GIPR_January_2022.pdf

¹⁸ The Declaration states that all market actors benefiting from the digital transformation should 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 people living in the EU.

¹⁹ Phenomena (2022) “Growing app complexity: Paving the way for digital lifestyles and immersive experiences”. The Global Internet Phenomena Report. January 2022 [online], p.3. Available at: https://www.sandvine.com/hubfs/Sandvine_Redesign_2019/Downloads/2022/Phenomena_Reports/GIPR_2022/Sandvine_GIPR_January_2022.pdf

²⁰ Barford, J.; Egan, K.; Lindsay, K. (2022) “Net neutrality in the UK: Networks versus content?” Enders Analysis. January 2022 [online]. Available at: <https://www.endersanalysis.com/reports/net-neutrality-uk-networks-versus-content>

²¹ The trend towards falling transit prices has continued steadily. While one Mbps of transit traffic still cost USD 0.63 in 2015, it is now less than USD 0.20 and, in many cases, less than USD 0.10. In recent years, prices have fallen by an average of 20% p.a. Falling prices were and are driven by technical progress and competition in the transit market as well as by peering and on-net CDNs. WIK Consult study, ‘Competitive conditions on transit and peering markets,

similar range to increases in traffic, resulting in a net neutral effect²². Operators have been able to keep total costs more or less stable and enable a decreasing cost/price trend of unit prices.

The incremental costs of internet traffic are therefore negligible for fixed broadband access. When it comes to mobile networks, BEREC²³ finds that these exhibit some degree of traffic-sensitivity, but that the marginal costs of additional data usage are quite low, as also demonstrated by Ericsson²⁴. BEREC also considers that the cost of building new network coverage is not traffic-sensitive. Critically, BEREC highlights that Mobile ISPs even facilitated data cap exemptions for selected content in their zero-rating offers (prior to the judgments of the European Court of Justice). “Based on this, the argument about traffic asymmetry does not seem to be in line with the actual behavior of ISPs,” concludes BEREC.

We also note that ECN providers are not transparent about the extent to which different types of service generate traffic. For example, traffic relating to illegal and adult content is unjustifiably omitted from the statistics they use in the public debate around network fees. References to LTGs are thus not apt as they do not provide a full picture of internet usage and data consumption impacting the network. The Film and TV Piracy Report 2022²⁵, measured 215 billion global visits to piracy websites in 2022, an 18% year-over-year increase compared with 2021. Also relevant for the discussion on network fees, 95% of the pirated content was delivered by streaming, and only 5% by download.

Furthermore, Illegal downloading of copyrighted materials accounts for 24% of the global bandwidth according to DataProt²⁶. With respect to adult content, according to a 2019 article by the BBC, “The most-visited pornography website – Pornhub – is roughly as popular as the likes of Netflix”²⁷, with “30 percent of all data transferred across the Internet [being] porn” according to a 2013 article of The Huffington Post²⁸. Finally, charging for traffic would create counterproductive incentives. If the level of traffic is truly the issue as claimed by providers of ECNs, network fees would not offer a solution. If providers of ECNs are actively charging, or passively being compensated for traffic, they would have no incentive to reduce the level of traffic or optimize it – in fact, they would benefit from increased traffic, delivered at suboptimal metered interconnections, to increase their revenues or in the case of a fund to generate data justifying higher amounts of funding.

Implications for European digital sovereignty’. 28 February 2022 [online]. Available at: https://www.bundesnetzagentur.de/EN/Areas/Telecommunications/Companies/Digitisation/Peering/download.pdf?__blob=publicationFile&v=1

²² Analysis Mason (2022) “Netflix’s Open Connect program and codec optimization helped ISPs save over USD1 billion globally in 2021”. Analysis Mason, July 2022. Fig. p. 8, Available at: <https://www.analysismason.com/contentassets/ef8295594cc54285bf554b05daa06431/modelling-the-impact-of-netflix-traffic-and-open-connect-on-isp-traffic-dependent-costs---2022-07-14.pdf>

²³ 4 BEREC (2022) “BEREC preliminary assessment of the underlying assumptions of payments from large CAPs to ISPs”. 7 October 2022 [online]. Available at: [https://www.berec.europa.eu/system/files/2022-10/BEREC BoR %2822%29 137 BEREC preliminary-assessment-payments-CAPs-to-ISPs 0.pdf](https://www.berec.europa.eu/system/files/2022-10/BEREC%20BoR%2022%29%20137%20BEREC%20preliminary%20assessment%20payments%20CAPs%20to%20ISPs%200.pdf)

²⁴ Ericsson (2020) “Understanding the Economics of 5G Deployments”. June 2020 [online]. Available at: https://www.ericsson.com/496678/assets/local/ericsson-blog/doc/paper_5geconomics-digital.pdf

²⁵ Chatterley, A. (2023). The Film and TV Piracy Report 2022 from MUSO. [online] Cinematography World. Available at: <https://www.cinematography.world/the-film-and-tv-piracy-report-2022/>

²⁶ Spajic, D. (2023). Piracy statistics for 2023. [online] DataProt. Available at: <https://dataprot.net/statistics/piracy-statistics/>

²⁷ Does pornography still drive the internet? (2019). BBC News. [online] Available at: <https://www.bbc.com/news/business-48283409>

²⁸ Kleinman, A. (2013). Porn Sites Get More Visitors Each Month Than Netflix, Amazon And Twitter Combined. [online] HuffPost Canada. Available at: https://www.huffpost.com/entry/internet-porn-stats_n_3187682

Section 2(a): CAPs are already incentivized to deliver content to end users as efficiently as possible.

Both CAPs and providers of ECNs have a vested interest in achieving a great experience for their customers and thus design their interconnections efficiently to achieve that goal. Through various forms of investments in the internet ecosystem, such as (direct or indirect) investment in content delivery networks (CDNs), encoding and compression technology and backbone infrastructure, MPA members already ensure that their content is delivered without friction and latency to the end user. These investments maximize the consumer experience by ensuring that content is delivered smoothly and without delays. Caching content closer to ECN's end users (on-net caching) is associated with substantial efficiency benefits and quality improvements, resulting in cost savings for ECN providers²⁹ ³⁰. According to a WIK Consult study³¹, the use of CDNs has a significant impact on the traffic handled by Tier 1 European telecoms: "Much of the internet traffic is handled by the large CAPs, which have integrated their own CDN and can thus deliver almost all their traffic locally to end users. As a result, transit traffic via traditional (European) Tier 1 telecoms has declined sharply." Regulators such as BEREC³² and Ofcom³³ have noted that efficiencies and investments by CAPs lead to growing demand from users being handled sustainably without increasing long term costs. Operators themselves consistently report that they have been able to handle growth in network traffic without growth in energy consumption³⁴³⁵ or costs³⁶, and have generally exhibited stable capex intensity despite steadily growing traffic in the last decade.

However, some incumbent providers of ECNs who are advocating for the introduction of network fees do not accept offers from content providers for on-net CDNs³⁷. They do this out of strategic reasons because they would not be able to monetize traffic via interconnection if content provider traffic is only on-net. This demonstrates the counterproductive nature of incentives associated with network

²⁹ An Analysis Mason study found that in total CAPs invested over 120 billion Euros (in networks) between 2018 and 2021, resulting in a cost reduction for the global telecom industry of between 5 and 6.4 billion Euros. Abecassis, D., Kende, M., Osman, S., Spence, R. and Choi, N. (2022). "The impact of tech companies' network investment on the economics of broadband". Analysis Mason. October 2022 [online] Available at: <https://www.analysismason.com/contentassets/b891ca583e084468baa0b829ced38799/main-report---infra-investment-2022.pdf>

³⁰ Analysis Mason (2022) "Netflix's Open Connect program and codec optimisation helped ISPs save over USD1 billion globally in 2021". 14 July 2022 [online]. Available at: <https://www.analysismason.com/contentassets/ef8295594cc54285bf554b05daa06431/modelling-the-impact-of-netflix-traffic-and-open-connect-on-isp-traffic-dependent-costs---2022-07-14.pdf>

³¹WIK Consult study, 'Competitive conditions on transit and peering markets, Implications for European digital sovereignty'. 28 February 2022 [online]. Available at: <https://www.bundesnetzagentur.de/EN/Areas/Telecommunications/Companies/Digitisation/Peering/download.pdf?blob=publicationFile&v=1>

³² BEREC (2022) "BEREC preliminary assessment of the underlying assumptions of payments from large CAPs to ISPs", 7 October 2022 [online] Available at: [https://www.berec.europa.eu/system/files/2022-10/BEREC BoR %2822%29 137 BEREC preliminary-assessment-payments-CAPs-to-ISPs 0.pdf](https://www.berec.europa.eu/system/files/2022-10/BEREC%20BoR%20%2822%29%20137%20BEREC%20preliminary%20assessment%20payments%20CAPs%20to%20ISPs%200.pdf)

³³Ofcom (2022) "Net neutrality review Consultation", 21 October 2022 [online]. Available at: https://www.ofcom.org.uk/data/assets/pdf_file/0028/245926/net-neutrality-review.pdf

³⁴ Carbon impact of video streaming. [online] Available at: <https://www.carbontrust.com/our-work-and-impact/guides-reports-and-tools/carbon-impact-of-video-streaming>

³⁵ Vodafone (2021) "Investor Briefing", June 2021 [online]. Available at: <https://investors.vodafone.com/sites/vodafone-ir/files/2021-06/vodafone-technology-investor-briefing-presentation.pdf>

³⁶McRae, N.J. (2018) "Scaling for Ultrafast, G.FAST, FTTP, 5G and the Cloud" BT. 2018 [online]. Available at: <https://indico.uknof.org.uk/event/42/contributions/555/attachments/752/924/UKNOF40-MCRAE-WEBSITE.pdf>

³⁷ WIK Consult study paragraph 16, 'Competitive conditions on transit and peering markets, Implications for European digital sovereignty'. 28 February 2022 [online]. Available at: <https://www.bundesnetzagentur.de/EN/Areas/Telecommunications/Companies/Digitisation/Peering/download.pdf?blob=publicationFile&v=1>

fees. The advantage of CDNs for both sides of the market is the improvement and assurance of the quality of transmission for the end customer.

Additional network fees would mechanically reduce funding available to content providers and undermine their ability to invest in the CDN infrastructure that brings content closer to the end customer. This can also lead to additional costs for ECN providers and degrade quality: if a content provider is forced to route traffic over other networks where it does not pay network charges, this may mean that an ISP not only loses revenue from network charges, but may even have to pay additional transit charges and the resultant network congestion would impact end users' quality of experience. Additionally, a shift in this dynamic may also have an adverse impact on the sustainability of data delivery to end users.

Section 2(b): The market for interconnection is competitive and well-functioning & South Korea exemplifies the adverse effects of network fees.

Regulators consider interconnection markets to be competitive and markets for peering and transit have never been covered by ex-ante regulation. In a 2013 report on internet traffic exchange, the Organisation for Economic Co-operation and Development (OECD)³⁸ found that “the internet has developed an efficient market for connectivity based on voluntary contractual agreements. Operating in a highly competitive environment, largely without regulation or central organization, the Internet model of traffic exchange has produced low prices, promoted efficiency and innovation, and attracted the investment necessary to keep pace with demand.”

In its 2012 study on interconnection and net neutrality, BEREC concluded that “the Internet ecosystem has managed to adapt IP interconnection arrangements to reflect (inter alia) changes in technology, changes in (relative) market power of players, demand patterns and business models. This happened without a need for regulation.”³⁹ This situation remains the case today: in its October 2022 preliminary assessment of the underlying assumptions of payments from large CAPs to ISP, BEREC reaffirmed its position, adding that “BEREC is not aware of any empirical evidence to suggest that the market has become non-competitive in recent years”. We believe BEREC is best placed to continue studying the interconnection market and whether interconnection practices may represent violations of Open Internet Regulations. Efficient on-net caching (discussed above) requires a series of network planning agreements and, in this respect, the relationship between content providers and providers of ECNs has become much more cooperative in the last 10 years.

Furthermore, although content providers have invested significantly in their own network infrastructure, this has not changed the ECN providers' access monopoly for their end users. Finally, there do not appear to be changes to the cost structure and/or cost burden that providers of ECNs are facing which would give reason to alter IP interconnection and pricing principles for a new distribution of the relevant costs. Some changes can even be seen which are to the benefit of the providers of ECNs

³⁸ OECD, “Broadband networks of the future” [online] OECD iLibrary. 2022. Available at: [Broadband networks of the future | OECD Digital Economy Papers | OECD iLibrary \(oecd-ilibrary.org\)](https://www.oecd-ilibrary.org/digital-economy/broadband-networks-of-the-future)

³⁹ BEREC, “Draft report on the Internet Ecosystem”. 9 June 2022 [online]. p. 65. Available at: https://www.berec.europa.eu/sites/default/files/files/document_register_store/2022/6/BoR_%2822%29_87_Draft_BEREC_Report_on_the_Internet_Ecosystem.pdf

– including cost savings generated by OTT providers' infrastructure investments and declining traffic-related transit costs^{40 41}.

With the exception of South Korea, the only country that introduced the SPNP principle, the market for IP-interconnection is unregulated in all countries. The case of South Korea exemplifies the adverse effects of the SPNP paradigm and its direct and negative impact on the Korean internet ecosystem and its users. South Korea's SPNP has caused less-efficient traffic flows, raised prices, and lowered content quality. Internet latency in Korea is the slowest of all developed countries because many pages are loaded from outside the country as a result of network fees pushing content offshore⁴². Content websites have had to reduce the quality of video content because of the high costs of bandwidth⁴³.

Yours sincerely,



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⁴⁰ Analysis Mason (2022) "Netflix's Open Connect program and codec optimisation helped ISPs save over USD1 billion globally in 2021". 14 July 2022 [online] Fig. 5, page 8. Available at: <https://www.analysismason.com/contentassets/ef8295594cc54285bf554b05daa06431/modelling-the-impact-of-netflix-traffic-and-open-connect-on-isp-traffic-dependent-costs---2022-07-14.pdf>

⁴¹"The trend towards falling transit prices has continued steadily. While one Mbps of transit traffic still costed USD 0.63 in 2015, it is now less than USD 0.20 and in many cases less than USD 0.10. In recent years, prices have fallen by an average of 20% p.a. Falling prices were and are driven by technical progress and competition in the transit market as well as by peering and on-net CDNs". From WIK Consult study page 9, 'Competitive conditions on transit and peering markets, Implications for European digital sovereignty'. 28 February 2022 [online]. Available at: https://www.bundesnetzagentur.de/EN/Areas/Telecommunications/Companies/Digitisation/Peering/download.pdf?__blob=publicationFile&v=1

⁴² see figure 16 - OECD."Broadband networks of the future" [online] OECD iLibrary. 2022. Available at: https://www.oecd-ilibrary.org/science-and-technology/broadband-networks-of-the-future_755e2d0c-en

⁴³Eudaly, Z. (2022). "Twitch testing peer-to-peer technology for source quality streams in Korea despite potential privacy concerns". Sportskeeda. 30 July 2022 [online]. Available at: <https://www.sportskeeda.com/esports/news-twitch-testing-peer-to-peer-technology-korea-despite-potential-privacy-concerns> ; JoongAng (2020) "Korean Netflix 'Watcha', "4K and VR are also picture rice cakes because of network usage fees"" The JoongAng. 15 January 2020 [online]. Available at: <https://www.joongang.co.kr/article/23683023 - home>

Annex

The role of VOD services in stimulating demand for connectivity, and the symbiotic relationship between CAPs and providers of ECNs is made clear in their advertisements. Below are examples⁴⁴:

Vos émotions en grand format dans toute la maison avec la Fibre Orange

NETFLIX
Netflix Standard offert pendant 6 mois sur demande puis 13,49€/mois*
avec Livebox Up et un 2^e décodeur TV inclus

Netflix offert pendant 6 mois sur demande avec Livebox Up Fibre à 31,99€/mois pendant 12 mois, pour les nouveaux clients internet, avec remise immédiate de 13€/mois* et remboursement différé de 5€/mois pour internet avec changement d'opérateur**, puis 49,99€/mois.
Offre internet avec engagement de 12 mois, soumise à conditions du 02/02/2023 au 06/04/2023, réservée aux particuliers en France métropolitaine, sous réserve d'éligibilité et avec équipements compatibles. Second décodeur sur demande.
[1] Offre de 13,49€/mois pour toute nouvelle souscription de fibre. Souscrits depuis le 2^e trimestre en amontant en quantité full HD connective à partir de Livebox Up jusqu'au 06/04/2023. En cas de changement d'opérateur, la remise est offerte pour la durée de la remise. L'accès à Netflix nécessite la création et l'activation d'un compte auprès de Netflix dans les 15 jours suivant la souscription. [2] 6€/mois le 3^e mois, 5€/mois le 4^e mois, 4€/mois le 5^e mois et 3€ le 6^e mois. [3] Remboursement par chèque ou virement bancaire à l'adresse indiquée au moment d'acheter votre fibre Orange. Sa validité est de 10000220244 - 111 ligne du Président. Numéro 87130 (jour-jour) ou 3632 (week-end) - 363 100 888 RCS Numéro.

JCDecaux

VOO

Si ce message ne s'affiche pas correctement, consultez la version en ligne.

Et si vous surfiez encore plus vite ? 🚀

Saviez-vous que **l'internet GIGA rapide est déjà disponible chez vous ?** Avec 1 GIGA/sec. toute la famille pourra surfer en même temps, à plein volume. 🚀

Je fonce

🔘 **L'internet GIGA rapide**

- ✓ Téléchargement sans limites
- ✓ Pas de ralentissements
- ✓ La 4K ultra HD sur Netflix, Disney+ ou Amazon Prime
- ✓ Télétravail en vidéo sans coupure
- ✓ Jeux en ligne sans latence

Activez le GIGA MAX

⁴⁴ Top: Advertisement found on a billboard in Brussels for connectivity services of Orange (March 2023). Bottom: Email sent to subscribers of VOO (Belgium) on March 8, 2023.