

Dear BEREC members.

We welcome your thoughtful approach in looking at this area, and its consultation.

We support BEREC's acknowledgment that Content Application Providers (CAPs) and electronic communications services / electronic communications networks (ECS/ECN, respectively) operators offer complementary services (p.3), which mutually increase each other's demand due to their distinct yet interconnected functionalities. Together, CAPs leverage the distributed infrastructure of ECS/ECN operators to deliver content, while ECS/ECN operators benefit from increased demand driven by the content and application creation of CAPs; from the devices and OS by large CAPs being sold together with an operator's bundle offer; as well as set-top boxes integrating both access to the internet and to OTT services or to voice assistants. This symbiotic relationship creates a cycle where the growth of one service enhances the value proposition and demand for the other, ultimately fostering a mutually beneficial innovation.

We also agree with BEREC's further explanation (at p.16) that CAPs and telcos provide complementary services in a synergistic relationship that plays a pivotal role in enhancing the efficiency, reliability, and resilience of digital infrastructure for the benefit of all. In addition to this complementarity, large CAPs' investments into building their own private transport networks and subsea cables lead to a greater resilience through diversity and the development of new landing locations. Additionally, these investments reduce the volume of traffic on traditional telcos' networks, while CAPs incur network costs for bringing content closer to telco end-users. This mutually beneficial partnership underscores the importance of collaboration in driving innovation and advancing network resilience.

That is why, we believe, it is inaccurate to imply, as this report does (e.g. p.32), that CAP investments as owners are somehow damaging or negative for telcos.

We think BEREC's market assessment is perceptive and largely correct and we support its work in building a common knowledge base in this way. However, we respectfully assert that the following BEREC statements are not representative of the factual situations in place and suggest BEREC reconsider these aspects of the report:

(i) *BEREC statements that large CAPs' investments have limited impact on global network resilience* (p.3, p39 and p.54). These statements are factually incorrect. In our experience, such investments have a significant and far-reaching impact on the resilience and reliability of the global network. CAPs' investments to enhance infrastructure, integrate edge computing, collaborate with network providers, invest in R&D, create opportunities for telcos to build different/alternative routes (e.g. by investing in fiber pairs on new

CAP-driven submarine systems) and collectively contribute to route diversity and resilience of the internet infrastructure. The report also claims CAPs are mainly focused on deploying submarine cables connecting Europe and North America. This ignores the route diversity from significant CAP investments in systems connecting Europe with Africa (2Africa, Equiano), Middle East (2Africa, IEX) and Asia (2Africa, IEX). The report comments on there being only two systems connecting Europe to Latin America using this fact to suggest a shortage. However, the significance of this is unclear. For example, the report does not present any evidence of a capacity shortage and offers no analysis of traffic demand to support its claims. Finally, the report fails to acknowledge that CAPs have a different connectivity requirement than telcos. In building submarine cables, CAPs' purpose is primarily to connect their data centers, most of which are located in Europe and North America, explaining their focus on these routes. The report suggests this focus increases costs and "risks associated with data sovereignty" - statements that are not supported with any analysis or evidence.

Dismissing CAP contributions as having limited impact on resilience is inaccurate and overlooks their substantial contributions to reliability, route diversity and stability of Europe's digital ecosystem.

(ii) *BEREC's statement that with large CAPs increasingly building their own transport networks (including submarine cables), the business model of carriers/traditional ISPs is significantly impacted (p.32).* CAP investment in transport networks (particularly subsea cables) allows traditional telcos/ISPs to avoid or reduce CapEx costs that they would otherwise have to make, with often unclear ability to recoup those costs.

For example, Meta estimates its private CDN network results in savings to ISPs of hundreds of millions of euros per annum, based on estimates of what ISPs would need to spend if they had to build and operate their own connections to carry traffic from Meta data centers in the US to their end users in Europe¹. It also considers alternatives to self-build where ISPs buy international connectivity from Tier 1 transit providers (assuming this capacity is available - in reality, this is very unlikely given current internet architectures).

A major reason CAPs started to build their own network infrastructure (particularly submarine cable systems) is because products of the scale and quality needed by CAPs were not available. Telcos were not investing in major new submarine capacity. CAPs cannot internalize revenue (p.32) from products that did not exist and were not offered and thus, it is inconsistent to suggest they internalized telco revenue. Furthermore, the

¹ More details here

<https://www.analysismason.com/consulting/reports/internet-content-application-providers-infrastructure-investment-2022/#:~:text=Investments%20made%20by,quality%20online%20services>

comments in this section fail to acknowledge that in many cases, CAPs became owners of new systems *in collaboration* with telcos. At least as regards to Meta subsea cables, local European telcos are generally consortium members participating in - and crucially benefitting from - the new system development. In addition to providing telcos with new capacity on systems that would not otherwise be available, CAP leadership has also reduced costs as a result of volume and pre-order commitments by CAPs. Furthermore, telcos in their capacity as consortium members benefit from the technical, legal, and operational expertise of CAPs while sharing the costs of shared facilities with them. We appreciate that BEREC acknowledges that *“most of these investments are done via consortium”* (p.36). However, we trust that the above additions and clarifications assist BEREC to better evaluate the significance of CAPs investments in this area.

Other comments

- We agree with BEREC’s taxonomy of CDNs (p.25), especially its recognition that CDNs can be either private or public, with significant differences in the purpose and operation for each type. However, despite having defined the concept of a *“Private CDN”* the paper does not develop the idea. It fails to use the term in any subsequent analysis or commentary, focusing only on Public CDNs. BEREC’s definition of Private CDNs references *“self-provisioning”* which we agree is core to the concept but respectfully suggest that BEREC could further develop this concept in the paper. The *“self-provisioning”* aspect of CDNs is analogous to non-public ECN/ECS discussed in BEREC’s recent paper on international submarine connectivity². We believe BEREC should draw the same conclusion for Private CDNs as it does in that Report for submarine cable systems: *“submarine cable systems operated by [CAPs] connecting their data centers to exploit the capacity exclusively for their own use... could be qualified as non-public ECN and/or non-publicly available ECS”*³. This would be an important clarification (as it was for submarine cable systems) and a helpful contribution to regulatory certainty.
- We strongly disagree with the use of STRAND consult claims, which we consider to be misleading. By way of example, on p.9 BEREC refers to a STRAND Consult report and repeats the claim that the total internet infrastructure investments made by the CAPs only represent approximately 1% of their global revenue. We consider this figure to be incorrect and its use in this report to be misleading.
- First, in 2022, we invested over \$30 billion (28 billion euros) globally in digital infrastructure, with a capex to revenue ratio at 27% - that is in line with or higher than that of major European telecom operators⁴.

² Public consultation on the Draft BEREC Report on general authorisation and related frameworks for international submarine connectivity, 12 December 2023.

³ Ibid. Conclusion 4, p. 31

⁴ https://s21.q4cdn.com/399680738/files/doc_financials/2022/q4/Earnings-Presentation-Q4-2022.pdf

- Second, the use of secondary sources can be misleading unless they share the same assumptions and definitions. We believe that it would be more helpful for the purposes of the BEREC report to source the information from primary sources (e.g. SEC filings) such as CAPEX/Revenue ratios rather than from consultant reports. For example, according to Meta Q4 earnings report (p.3) we anticipate our full-year 2024 capital expenditures will be in the range of \$30-37 billion (28-34 billion euros), a \$2 billion (1.9 billion euros) increase of the high end of our prior range. We expect growth will be driven by investments in servers, including both AI and non-AI hardware, and data centers as we ramp up construction on sites with our previously announced new data center architecture (full report could be found [here](#)).
- For example, the definition of “internet infrastructure” in the STRAND Consult and Analysis Mason reports referred to by BEREC are not comparable. Analysys Mason defines it as including hosting (i.e. data centers), transport (i.e. submarine and terrestrial cables) and delivery (i.e. peering and caching).⁵ STRAND Consult defines it as “capital expenditure in networks”.⁶ It is not clear what conclusions BEREC is drawing by juxtaposing these two very different studies. Yet, we consider Analysys Mason’s definition closer to our understanding of internet infrastructure as the network is only a portion of the internet chain and should be viewed together with other elements, including hosting and delivery.

We trust that the above comments are of assistance. We would be happy to discuss further with BEREC.

Best regards,

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⁵ Page 5: <https://fburl.com/med02e2d>

⁶ <https://fburl.com/cgbv71h0>