Dynamic Spectrum Alliance Limited
3855 SW 153rd Drive
Beaverton, OR 97003
United States
http://www.dynamicspectrumalliance.org

October 31st, 2022

Dynamic Spectrum Alliance's response to the BEREC consultation on its 2023 Work Programme

The Dynamic Spectrum Alliance ("DSA") thanks BEREC for organizing a consultation on the BEREC 2023 Work Programme, building on the BEREC Strategy 2021-2025 to promote full connectivity, support sustainable and open digital markets and empower end-users, in support of Europe's vision, targets and avenues for Europe's Digital transformation. In our response, we would like to highlight areas for further work and elements to take into consideration, as it adopts its upcoming 2023 Work Programme.

The DSA is a global, cross-industry, not for profit organization advocating for laws, regulations, and economic best practices that will lead to more efficient utilization of spectrum, fostering innovation and affordable connectivity for all. We advocate for policies that promote unlicensed and dynamic access to spectrum to unleash economic growth and innovation. Additionally, we advocate for a variety of technologies that allow spectrum sharing enhancing broadband access.[1]

Strategic priority 1: Promoting full connectivity

We welcome BEREC's commitment full connectivity, in line with the focus of promoting high-capacity networks within the European regulatory framework. We believe that achieving full connectivity for EU citizens and businesses requires a holistic approach, one that recognizes and encourages all gigabit technologies (including 5G, fibre, coax cable, satellite, fixed wireless access and the latest generations of license-exempt technologies such as Wire Access Systems/Radio Local Area Networks, of which Wi-Fi is an example).

Particularly, Wi-Fi constitutes a perfect complement to fibre, and as complementary technologies, they are critical to provide European citizens the wireless experience expected in a truly digital gigabit society. A non-holistic approach to the above-mentioned technologies would hinder Europe's digital future, necessary to achieve full connectivity and ensure an effective implementation technology neutrality in Europe. More so, without sufficient investments in and spectrum allocations to Wi-Fi, the investments in fiber will not reap their benefits towards the end user. This is very worrisome as already today; **indoor connectivity**

[1] Our membership spans multinationals, small-and medium-sized enterprises, as well as academic, research and other organizations from around the world. A full list of DSA members is available on the DSA's website at www.dynamicspectrumalliance.org/members.

Dynamic Spectrum Alliance Limited
3855 SW 153rd Drive
Beaverton, OR 97003
United States
http://www.dynamicspectrumalliance.org

carries the vast majority of internet traffic[2]. And this is even without considering the impact of new technologies like AR/VR. Studies, such as the ASSIA study on Wi-Fi[3] and its DSA companion whitepaper[4] on the consequences of the report's findings, demonstrate that Europe is facing a severe Wi-Fi spectrum crunch in years to come, significantly sooner than 2030.

We therefore strongly encourage BEREC to **start measuring end-user traffic in terms of technologies used, so that further efforts to promote full connectivity can be based on a truly data-driven approach in addition to predictions about the future.**

In addition, we wish to make the following observations regarding point 1.5 on very high-capacity networks (VHCN).

1.5. Update of criterion 4 of the BEREC Guidelines on very high-capacity networks (carry-over).

BEREC plans to update its criterion 4 of the BEREC Guidelines on very high-capacity networks, which provides that any network providing a wireless connection which is capable of delivering, under usual peak time conditions, services to end-users with a certain defined quality of service.

Generally, we do believe it is critical not to exclude customer premise connectivity as this oversees a key connectivity challenge. End users need multigigabit connectivity that is available in living rooms, office open space and technical halls, thus requiring an extension of the connectivity within premises from the gigabit network termination point in the basement. As a result, it is important to bear in mind user benefits. Important to focus on user benefits, rather than monitoring quality of service (QoS) from a network perspective. In this context, VHCN connectivity should be define as network that enables end-users to fully harness the connectivity QoS.

We believe that the VHCN guidelines should define connectivity QoS via taking into account the experience of the end user, rather than of the QoS controlled by the operator. To that end, and although operators are not responsible for security in premise QoS, they should nevertheless bear a responsibility for: 1) informing the end user if the weakest QoS link is the in-premise link and 2) provide products and services to help end users fix their in-premise link.

[2]How do Europeans connect to the Internet, http://dynamicspectrumalliance.org/wp-content/uploads/2022/06/DSA-WhitePaper-How-do-Europeans-connect-to-the-Internet.pdf
[3] ASSIA "State of Wi-Fi" report, http://dynamicspectrumalliance.org/wp-content/uploads/2021/06/ASSIA-DSA-Summit-Presentation-v7.8.pdf.
[4] Lessons from the Assia Report on "Wi-Fi and Broadband Data", http://dynamicspectrumalliance.org/wp-content/uploads/2021/11/Lessons-from-the-Assia-Report-on-Wi-Fi-and-Broadband-Data.pdf.

Dynamic Spectrum Alliance Limited
3855 SW 153rd Drive
Beaverton, OR 97003
United States
http://www.dynamicspectrumalliance.org

While the QoS can only be reliably measured at the NTP, the NTP should also support the same QoS in its in-premise interfaces. For example, an internet service provider home router should support Wi-Fi, delivering at least the same connectivity QoS as the fixed network connectivity. Also, the ISP should equip the end users to identify whether QoS is limited by their fixed network or their in-premise connectivity.

Looking at the criteria laid down at BEREC's guidelines on VHCN, we would like to offer recommendations on how to ensure consistency across all criteria.

- **Current criteria 1 and 2, hinder the ability of end users to fully benefit from VHCN connectivity. As a result, we recommend expanding the definitions and clarifying that these networks must provide connectivity means past NTPs whose QoS is consistent with criteria 3 and 4.**
- **We also recommend expanding the definition of criteria 3 and 4 -with regards to performance thresholds- to indicate that such QoS must also be available past NTPs.**

Strategic priority 2: Thriving sustainable and open digital markets

Building on environmental sustainability of ICTs and electronic communication network and services, in support of Europe's twin transition ambitions and EU Green deal targets, BEREC's work will be particularly critical especially considering the green deal ambitions and the energy shortage challenges that Europe is currently facing.

Maximizing energy efficiency in electronic communication, is inherently linked to Europe's digital transformation, and will be critical to achieve Europe's sustainability goals. In that regard, the Dynamic Spectrum Alliance highlights the importance of spectrum choices to help combat climate change. There is probably no need to remind BEREC of the recent report published by ARCEP[5] which highlights that 70-80% of the network emissions are due to the access network and that fibre networks are ten times more effective than mobile networks to deliver data in an energy efficient manner. In the same vein, a study comparing, amongst other things, the energy efficiency of 5G Fixed Wireless Access (FWA) and pure fibre deployments in Sweden[6], concludes that FWA solutions have significantly higher levels of energy consumption than the pure fibre-based solution. This is particularly relevant for the 6 GHz band which, if identified for IMT, would require MNOs to increase transmission power to compensate for the increased propagation loss resulting from the higher operating frequency and the base station antenna placement below rooftop.

[5] Achieving Digital Sustainability Report, https://en.arcep.fr/uploads/tx_gspublication/achieving-digital-sustainability-report-dec2020.pdf

[6] Li, Jie; Forzati, Marco. Conference Paper 'Cost, performance and energy consumption of 5G fixed wireless access versus pure fiber-based broadband in Sweden' ITS Online Event, 14-17 June 2020.

Dynamic Spectrum Alliance Limited
3855 SW 153rd Drive
Beaverton, OR 97003
United States
http://www.dynamicspectrumalliance.org

The DSA therefore wishes to make following concrete reflections and recommendations regarding items 2.3 and 2.4 of BEREC's work program.

2.3 BEREC Report on Indicators to measure environmental impact of electronic communication networks and services (carry-over)

The DSA would definitely wish to contribute to possible consultations in this area organized by BEREC or the NRA.

At this stage, we note that the ITU has forecast[7] that the energy used by mobile networks around the globe will emit 73.0 Mt CO2 equivalent (CO2e) in 2025, compared with 35.2 Mt CO2e for fixed networks. Considering the share of mobile data and fixed broadband lines in Europe, around 4.8 Mt CO2e will be emitted from fixed networks and 10 Mt CO2e from mobile networks in the EU. That suggests fixed networks produce less than half the CO2e of mobile networks, even though they transport more than ten times the amount of data. Hence, a combination of full-fibre and energy-efficient Wi-Fi technologies such as Wi-Fi 6E and Wi-Fi 7 represents the greenest way to connect indoors (Analysis Mason, June 2020).[8]

2.4 Potential ad-hoc work on ICTs sustainability in the frame of the European Green Deal implementation[9]

It goes without saying that the important work on ICT sustainability can only be done in close cooperation with all relevant stakeholder, especially so with the Radio Spectrum Policy Group (RSPG).

We see however that spectrum focused institutions such as the RSPG may not take the full breadth of considerations into account. Yet, the RSPG position on the upper 6GHz band will have a direct impact on the sustainability of the digital transition. Allocating the upper 6GHz band to either Wi-Fi or mobile networks directly impacts whether traffic flows over fixed or mobile networks, with very significant environmental impact.

Therefore, we strongly recommend BEREC to express itself on RSPG opinions which may be impacting the relative roles of several connectivity platforms and hence have sustainability impacts, for example spectrum decisions impacting the availability of Wi-Fi, satellite or mobile networks for end users.

---

[7] ITU, Greenhouse gas emissions trajectories for the information and communication technology sector compatible with the UNFCCC Paris Agreement, 2020.

[8] "A combination of full-fibre and low-power-mode Wi-Fi 6 represents a more efficient and a greener way to connect wirelessly in the indoor environment than mobile" (Analysys Mason Full fibre access as strategic infrastructure: strengthening public policy for Europe, June 2020).

[9] DSA Response to RSPG consultation on the role of spectrum in climate change, available at http://dynamicspectrumalliance.org/wp-content/uploads/2021/09/DSA-response-to-RSPG-consultation-on-role-of-spectrum-in-climate-change.pdf

Dynamic Spectrum Alliance Limited
3855 SW 153rd Drive
Beaverton, OR 97003
United States
http://www.dynamicspectrumalliance.org

Strategy priority 3: Empowering end-users

3.1. BEREC contribution to empowering end-users through environmental transparency on digital products and services

BEREC considers end-users' awareness of environmental issues as critical for end-users' empowerment and for ICT sustainability. Environmental information on digital products and services could enlighten users' choices in terms of their digital consumption. Complementary to effects on the demand side, this data-driven approach of end-users' empowerment could create positive incentives for digital players to support the deployment of greener digital solutions and limit the risk of greenwashing.

In 2023, BEREC will engage in a fact-finding process to raise NRAs' knowledge of existing work and analysis of this issue in the form of a workshop on end-users' empowerment by providing them with environmental information, potentially in cooperation with relevant stakeholders (e.g., BEUC and the European Environmental Bureau). This event will provide input for a report by BEREC on the issue. This report should also provide a general overview of initiatives by NRAs and other relevant stakeholders regarding the empowerment of end-users in terms of sustainability plus an analysis of most effective ways of reaching out to end-users in this regard (e.g., educational campaigns, data collection on end-users' approaches to sustainability, etc.).

This workstream will also include a communication campaign on key facts about the environmental impacts of devices and services for the use of BEREC and volunteer NRAs.

Particular attention will be given to the circular economy, especially in relation to the life cycle of devices, and principles of equipment durability and repairability (including efforts to counter programmed obsolescence). Additionally, attention will also be paid to the energy consumption requirements for the different methods available of providing high-speed broadband access to end user devices in both residential and enterprise settings.

3.4. BEREC Guidelines detailing Quality of Service (QoS) parameters

According to Article 104 of the EECC, national regulatory authorities in coordination with other competent authorities may require providers of Internet access services (IAS) and of publicly available interpersonal communications services (ICS) to publish comprehensive, comparable, reliable, user-friendly and up-to-date information for end-users on the quality of their services and on measures taken to ensure equivalence in access for end-users with disabilities. National regulatory authorities in coordination with other competent authorities have to also specify, taking utmost account of BEREC guidelines, the QoS parameters to be measured, the applicable measurement methods and the content, form and manner of the information to be published, including possible quality certification mechanisms.

Dynamic Spectrum Alliance Limited
3855 SW 153rd Drive
Beaverton, OR 97003
United States
http://www.dynamicspectrumalliance.org

In 2020, BEREC published the first guidelines detailing QoS parameters (BoR (20) 5353). The guidelines provide that the process of undertaking a review will commence two years from the adoption and publication of the guidelines by BEREC.

In addition, the progress indicators for 5G deployment need to be improved in the context of the annual monitoring cycle of the future Digital Policy Programme 'Path to the Digital decade'. This includes identification of technical KPIs to qualify the 5G targets in terms of Quality of Service and enable the monitoring of service quality in deployed 5G networks. This initiative should aim to assess Quality of Service not only for basic 5G, but also, in the future, for advanced 5G and mission critical 5G connectivity to be used in vertical industries.

However, in the Digital Decade legislation, the KPI for IAS broadband speed is measured at the network termination point, which is typically at the structure (e.g., residence). Once indoors, the broadband signal has to be distributed to the various end user devices operating at any given time. Thus, consumers operating end user devices within the structure may experience a lower than advertised broadband speed due to a number of factors, including insufficient Wi-Fi spectrum indoors. As a consequence, there could be instances where an ISP could legitimately claim that the KPI for the 1 Gb/sec IAS broadband speed is met (as measured at the network termination point), but from the perspective of the end-user(s), the broadband speed of the IAS to the end user device operating within the structure does not meet the KPI. We would like to strongly encourage BEREC to properly account for these limitations in the interest of consumer transparency.

The DSA remains at BEREC's disposal to discuss in more detail these comments or provide any further information that might be required.

Respectfully submitted,

Martha SUAREZ
President
Dynamic Spectrum Alliance
Martha.Suarez@dynamicspectrumalliance.org