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DSA input to the RSPG consultation on the draft Opinion on the role of radio spectrum policy to help combat climate change

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The Dynamic Spectrum Alliance (DSA) welcomes the draft RSPG Opinion on the role of radio spectrum policy to help combat climate change ("the RSPG draft Opinion") and is pleased to contribute to the discussion on how spectrum policy can help achieve Europe's objective of climate-neutrality with the following observations.

1. The digital sector, including wireless products and services, will play a critical role in Europe's green transition

There has been a lot of discussion about the environmental footprint of the digital sector. DSA believes that regulators and policymakers should base their decisions on factual information. In this sense, DSA fully supports the RSPG proposal to improve the methodologies to assess the impact of ECS wireless technologies on climate change. DSA nevertheless kindly requests RSPG to reflect in its recommendations other ECS wireless technologies going beyond cellular technologies, such as Wi-Fi. We also invite RSPG to consider analysing the environmental impact of different spectrum management models, in particular licence-exempt spectrum vs. exclusively licensed spectrum.

Although measuring the ecological footprint of the digital sector is a prerequisite for policymakers before enacting regulation, any action addressed to this sector should consider the critical role that the digitalization of the economy will play in advancing Europe's green transition. A recent report by Ecorys refers for example to the potential positive contribution of AR/VR technologies. A positive net contribution will in any case require that the environmental footprint of digital services do not outweigh the benefits of such technologies in greening other sectors. Given that the green transition of the whole economy is underpinned by the general take up of digital services by citizens, businesses and public services, regulation of sustainability in the digital sector should avoid targeting the growth of the digital services (in terms of traffic or consumption) and rather focus on parameters such as energy efficiency or carbon neutrality.

Although estimating the net impact of the digital sector might be beyond the remit of spectrum regulators, DSA invites RSPG to reflect in its Opinion the specific role of wireless ECS in reducing

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the carbon footprint of other industries. The RSPG's proposal to improve the methodologies to assess the impact of wireless ECS should aim at an improved understanding of both their positive and negative environmental impact on the whole economy. Collaboration with regulators of other sectors to track the progress on sustainability enabled by digital services could help monitor how digital, including wireless ECS, is impacting other sectors.

2. Efficient allocation of spectrum to combating climate change - urgency to make available the 6425-7125 MHz band for licence-exempt spectrum

DSA highlights the importance of having adequate and sufficient harmonized spectrum for the development of wireless services in the EU, including those particularly well positioned to help combat climate change.

A recent report published by ARCEP 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[1], concludes that FWA solutions have significantly higher levels of energy consumption than the pure fibre-based solution.

Against this evidence, regulators can positively contribute to reduced emissions by promoting an energy-efficient mix of technologies, with 5G networks where mobility is needed and fibre networks as the first connectivity option otherwise. Given that the primary way to connect to fibre networks is via a Wi-Fi connection, a combination of full-fibre and energy-efficient Wi-Fi technologies represents the greenest way to connect indoors (Analysis Mason, June 2020).[2] Following the recent EC Decision on the 5945-6425 MHz band, the 6425-7125 MHz band should be also opened to WAS/RLAN in a harmonized way in Europe to maximise the benefit from the energy efficiency of fixed/RLAN architecture.

Opening the 6425-7125 MHz band to WAS/RLAN rather than allocating it to IMT in Europe would have additional environmental benefits which we recommend taking into account.

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[1] 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.

[2] "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).

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Firstly, providing indoor connectivity from (IMT) networks located outdoors is extremely inefficient both from an energy and spectrum utilization standpoint. Energy efficient windows, which are expected to become standard in Europe given the green transition and the energy efficiency imperatives, can attenuate radio waves in the 6 GHz band by 40-60 dB[3], and thermal insulation material used for retrofitting older building stock typically attenuates RF signals above 500 MHz by more than 30 dB[4] so that signals entering from the outside will experience a very significant building entry loss. Industry stakeholders all agree that more than 90% of wireless traffic is generated or consumed indoors and that correspondingly most users are indoors, as well (see 6 GHz IMT deployment models agreed in ITU). Hence, indoor coverage in the 6 GHz band is best provided from inside a building, both from a spectrum and energy efficiency standpoint. In the 6 GHz band, a combination of fibre and RLAN is the most energy-efficient solution to provide end users with actual gigabit connectivity, as envisioned in the 2030 Digital Compass.

An efficient allocation of harmonized spectrum can also reduce emissions by reducing the variety of country-specific hardware and software required to comply with the different regulations. The role of terminal equipment is especially relevant as highlighted by the aforementioned ARCEP report on sustainability, which found that 81% of the digital technology's environmental footprint is coming from terminals (only 5% from the network, 14% from the data centres).

3. Spectrum management actions and the EECC framework

DSA agrees with RSPG that "the availability of large contiguous frequency blocks per operator could avoid the energy consumption associated with the support of multiple carriers and carrier aggregation. Member States may strive to improve the energy efficiency of networks by making available spectrum in the largest blocks possible where appropriate." (point 24 of the RSPG draft Opinion). While the draft Opinion conclusion seems to be limited to cellular technologies by referring to operators, DSA would like to emphasize that the same principle applies to any wireless technology, including Wi-Fi. In this sense, DSA strongly recommends European policymakers to proceed with the assignment of the full 5945-7125 MHz band to WAS/RLAN in order to improve the energy efficiency of Wi-Fi.

[3] Ragulis et al: Shielding Effectiveness of Modern Energy-Saving Glasses and Windows; IEEE Transactions on Antennas and Propagation, June 2017
[4] https://www.caparol.de/caparol_pim_import/caparol_de/products/ti/113351/TI_024_CT_EN.pdf

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DSA further agrees with RSPG that "the roll-out of indoor small cells may also contribute to combat climate change" (point 27 of the RSPG draft Opinion). DSA urges RSPG to acknowledge that Wi-Fi is by far the dominant small cell technology and therefore plays a major role in combating climate change. Wi-Fi based 'small cells' are deployed in almost every European household, office and business and advances in this technology (Wi-Fi 6E, Wi-Fi 7) greatly reduce energy consumption. Considering the enormous installed base of Wi-Fi equipment, any non-Wi-Fi indoor small cell solution would also have to be "Wi-Fi-compatible" in order to provide Wi-Fi clients with connectivity, thus increasing cost and energy consumption.

As highlighted above, due to propagation characteristics (building entry loss), the energy consumption of the outdoor-to-indoor FWA solution is significantly higher than that of a combination of fibre (up to the premises) and Wi-Fi (for the in-building connectivity). The increase in energy consumption of a mobile terminal that transfers data from an indoor location to an outdoor base station must be taken into account. The higher consumption necessitates more frequent battery recharges which in turn reduces the battery's life span.

With these observations DSA hopes to meaningfully contribute to the ongoing discussions on the role of the digital sector in helping Europe achieve its sustainability goals, and looks forward to continuing the dialogue with RSPG, the relevant EU institutions and other stakeholders on this important topic.

About the DSA

The Dynamic Spectrum Alliance (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 and foster 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 dynamic access to spectrum.

Respectfully submitted,

Martha SUAREZ
President
Dynamic Spectrum Alliance