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VIA ELECTRONIC FILING

CNECT-RSPG@ec.europa.eu

Re: DRAFT RSPG Opinion on the development of 6G and possible implications for spectrum needs and guidance on the rollout of future wireless broadband networks, RSPG23-026 FINAL, 14 June 2023

Dear Radio Spectrum Policy Group,

Wi-Fi Alliance commends the Radio Spectrum Policy Group ("RSPG") on its ongoing work in the area of European spectrum planning. The RSPG draft opinion on the development of 6G and possible implications for spectrum needs and guidance on the rollout of future wireless broadband networks (the "*Draft Opinion*") will inform and support the ongoing EU and its Member States spectrum management policy efforts.

**Wi-Fi Alliance Takes Exception to Erroneous Characterizations of
Unlicensed Spectrum in the *Draft Opinion***

Wi-Fi technology is foundational to the growing socioeconomic benefits delivered by the connected devices because it is easily deployed at low cost, integrates with existing networks, and shares security, management, and authentication models. Wi-Fi also excels in maximizing spectrum sharing and utilization with low-power, cognitive radio techniques including spectrum sensing, spectrum sharing, and adaptive transmission. With these features, Wi-Fi, in conjunction with fixed broadband (e.g., fiber), significantly outperforms other wireless technologies (e.g., cellular) in delivering multi-gigabit connectivity. That is why Wi-Fi Alliance respectfully disagrees with unsubstantiated assertions (quoted below) that may have been inadvertently included in the *Draft Opinion*:

- *"Use of unlicensed spectrum is mainly targeted towards consumers use and non-critical systems and is less suited for enterprise customers."*¹
- *"[d]ue to the license exempt spectrum usage, limited coverage, limited power to provide the last few meters link, the spectrum needs for license exempt are covered already with the identified spectrum in Europe."*²

Wi-Fi Alliance calls on the RSPG to recognize that Wi-Fi technology is a transformative force multiplier for innovation. Numerous techno-economic studies, including those by OECD, Capgemini, and others, consider the future importance of Wi-Fi supported Industry 4.0 use cases in enterprise settings including healthcare, location determination, cloud computing, office and industrial automation, wireless display casting, and AR/VR, with many applications yet to be defined. The COVID-19 pandemic demonstrated that high-speed Wi-Fi connectivity is vital to millions of Europeans for working, learning, and staying

¹ DRAFT RSPG Opinion on the development of 6G and possible implications for spectrum needs and guidance on the rollout of future wireless broadband networks, RSPG23-026 FINAL, Section 5.1, page 25

² DRAFT RSPG Opinion on the development of 6G and possible implications for spectrum needs and guidance on the rollout of future wireless broadband networks, RSPG23-026 FINAL, Section 6.3, page 32

connected. While high-speed broadband can be delivered by either fiber, fixed-wireless, or satellite technologies, Wi-Fi is the primary means of distributing this connectivity to the European end users in enterprises and residences.

As Wi-Fi becomes increasingly essential to connecting millions of European consumers and businesses to billions of devices every day, it is evident that access to the 5.945-7.125 GHz spectrum is imperative for futureproofing of Wi-Fi's ability to deliver multi-gigabit connectivity in Europe.³ The latest generations of Wi-Fi technology (i.e., Wi-Fi 6E and Wi-Fi 7) are designed to deliver optimal performance with wider (e.g., 160 MHz or 320 MHz) channels which can only be implemented with license-exempt access to the entire 5.945 – 7.125 GHz band. Without access to the 6.425 -7.125 GHz spectrum, European consumers and enterprises cannot realize the full benefits of Wi-Fi 6E, Wi-Fi 7 and future generations of Wi-Fi technologies. Curtailed license-exempt access limited to the 5.945 - 6.425 GHz band (currently available in Europe) is not sufficient for optimal Wi-Fi performance in terms of latency and data throughput. And, importantly, there are no alternative frequency bands that may accommodate expanding Wi-Fi spectrum requirements now or in the future.

6 GHz Wi-Fi: The Sustainable Choice

Wi-Fi Alliance enthusiastically supports the European Commission's Sustainability Development Goals (SDGs) and believes that spectrum policy should play a key role in achieving these objectives. In considering the 6G connectivity, Wi-Fi Alliance calls on the RSPG to note:

- 1) Under the European Digital Decade Programme target, by 2030 nearly 100% of EU households are set to be served with a fiber-to-the-home (FTTH) connection. By then, European households and enterprises are likely to be making extensive use of immersive cloud-based services, such as e-health, remote learning, high-definition video and gaming, and augmented/virtual reality and other 6G use cases. But these FTTH deployments require corresponding local area wireless connectivity (i.e., Wi-Fi) to deliver envisioned capabilities and benefits to end users. This necessary capability cannot be achieved without sufficient spectrum for Wi-Fi.
- 2) The vast majority of the 6G connectivity requirements will be realized indoors where a combination of FTTH and Wi-Fi is both the most technologically feasible, cost-effective and sustainable solution. In fact, FTTH networks are 2.5x more energy efficient per megabyte transmitted than 5G (cellular networks), according to a new study by WIK-Consult Report.⁴ Cellular signals (e.g., 5G, 6G) must penetrate building walls, expending high levels of transmit power just to reach end users. Similarly, an indoor 5G/6G device signals to an outdoor base station use a disproportionate amount of energy just to overcome obstacles and distances in the propagation path, requiring recharge cycles, increased battery wear, and additional electronic waste.

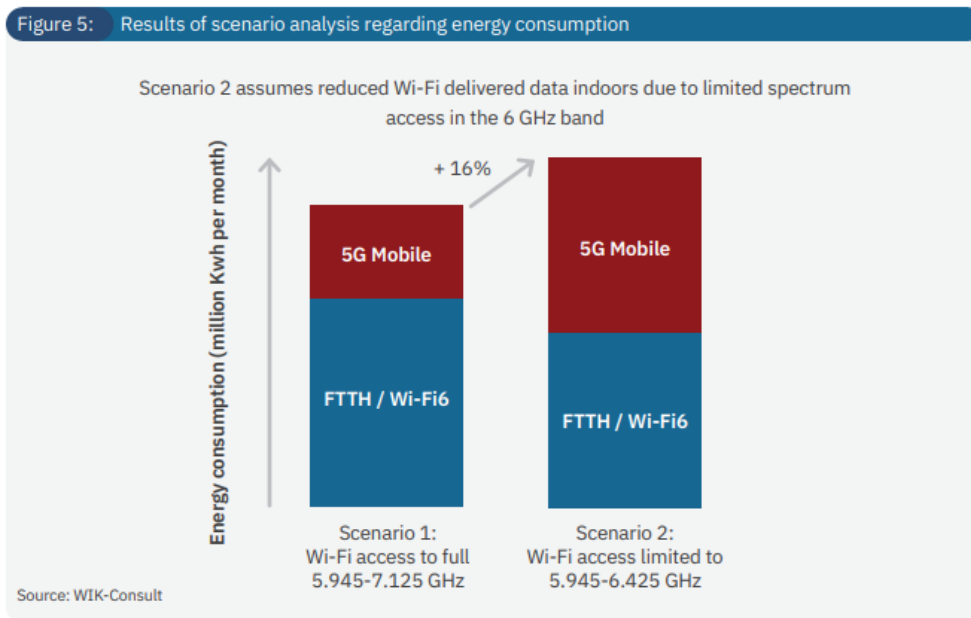
According to the WIK Consult, precluding Wi-Fi access to the 6.425-7.125 GHz will lead to congestion and degradation in the FTTH/Wi-Fi performance, driving a 15 % increase in data traffic over mobile networks.

³ Wi-Fi is integral to Europe's connectivity objectives, as explained in the Commission's [2030 Digital Compass: the European way for the Digital Decade](#). This publication underscores the central role of gigabit connectivity in the European digital transition which requires Wi-Fi functionality.

⁴ Sustainability Benefits of 6 GHz Spectrum Policy, WIK Consult, July 31, 2023, available at <https://www.wi-fi.org/download.php?file=/sites/default/files/private/SustainabilityBenefitsof6GHzSpectrumPolicy202307.pdf>

The increased reliance on mobile networks, in turn, will result in 16% higher energy consumption, which would lead to 3.2 megatons of additional CO₂ emissions in Europe per year by 2030.

The WIK Consult Report clearly shows that license-exempt access to the full 6 GHz band will enable greater use of FTTH/Wi-Fi (rather than mobile) to deliver gigabit connectivity in Europe, which will reduce the environmental footprint of telecom networks and support Europe's SDG to become the world's first climate-neutral continent.



2023 World Radiocommunication Conference (WRC-23)

Wi-Fi Alliance fully concurs with the RSPG that WRC-23 decisions on the 6.425 - 7.125 GHz spectrum will impact the 6G implementation strategies.⁵ In this regard, Wi-Fi Alliance respectfully asks the RSPG to consider two important factors:

- (1) Extensive technical studies along with the subsequent EC decision⁶ have already established regulatory conditions that are necessary for coexistence with important incumbent operations in the 6 GHz band. These conditions are acceptable for license-exempt networks (e.g., Wi-Fi) but are not feasible for *commercially viable* licensed 6G deployments because, to maintain the necessary quality of service, licensed networks require priority access to the spectrum. With priority spectrum access, licensed 6G networks cannot avoid interfering with or tolerate interference from incumbent transmissions in the 6.425 - 7.125 GHz band. Conversely, Wi-Fi, built on IEEE 802.11 standards, has demonstrated the ability to coexist with and protect other spectrum users. These protections are inherent to Wi-Fi technology and are critical to its efficient operations on license-exempt basis

⁵ DRAFT RSPG Opinion on the development of 6G and possible implications for spectrum needs and guidance on the rollout of future wireless broadband networks, RSPG23-026 FINAL, Section 5.3, page 28

⁶ Commission Implementing Decision (EU) 2021/1067 of 17 June 2021 on the harmonised use of radio spectrum in the 5 945-6 425 MHz frequency band for the implementation of wireless access systems including radio local area networks (WAS/RLANs)

worldwide. And Wi-Fi industry is committed to implementing technical, operational, and regulatory solutions that ensure coexistence with ongoing, incumbent operations in the 6 GHz band.

- (2) Even if the WRC-23 were to identify the 6.425 - 7.125 GHz band for IMT in some countries, significant time (i.e., years) and investments (i.e., billions of euros) would be required to develop, implement, deploy, and operate the 6G (IMT) networks in the upper-6 GHz band. It is unlikely that such IMT networks would be economically viable given limited market scale and harmonization. In the meantime, the latest Wi-Fi technology, operating in the 5.945 - 7.125 GHz band, is already on the market, empowering tremendous connectivity benefits.

Wi-Fi Alliance respectfully asks the RSPG to consider that an IMT identification in the 6.425 - 7.125 GHz band at WRC-23 will do little to address growing demand for wireless broadband while permanently impairing Wi-Fi connectivity in Europe, and thereby, undermining EU connectivity goals and objectives.

Conclusion

Under the most optimistic scenario, commercial rollout of the 6G networks in the EU will not happen until 2030 and more likely that it will be delayed by several more years. Spectrum needs of the 6G implementation are undefined, at best, particularly in light of recent decisions on the pioneer bands identified for 5G (i.e., 700 MHz, 3.5 GHz, 26 GHz) and other frequency bands. According to statistics published by the UK⁷ and German⁸ regulators, only 1-3% of broadband traffic is carried over mobile networks. This fact is clearly evidenced by the European Commission's Digital Economy and Society Index 2022, *"spectrum assignment, an important precondition for the commercial launch of 5G, is still not complete: only 56% of the total 5G harmonized spectrum has been assigned, in the vast majority of Member States"*.⁹ Wi-Fi Alliance respectfully asks the RSPG to consider that reserving more spectrum resources (i.e., 6.425 - 7.125 GHz) now for yet to be determined 6G implementations that may not materialize decades into the future is contrary to the European public interest benefits and environmental sustainability objectives. Moreover, the lack of 6.425 - 7.125 GHz access and regulatory uncertainty will impair current and future Wi-Fi generations in Europe.

Wi-Fi Alliance appreciates the opportunity to contribute to the RSPG efforts.

Respectfully submitted,
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⁷ [Communications Market Report 2021, UK Ofcom \(p. 3\)](#)

⁸ [Tätigkeitsbericht Telekommunikation 2020/2021, BNetzA \(p. 20 ff.\)](#)

⁹ See EC Digital Economy and Society Index 2022: overall progress but digital skills, SMEs and 5G networks lag behind available at https://ec.europa.eu/commission/presscorner/api/files/document/print/en/ip_22_4560/IP_22_4560_EN.pdf