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August 12, 2022

RSPG Secretariat
Avenue de Beaulieu 33,
B-1160, Bruxelles, office BU33 7/65
CNECT-RSPG@ec.europa.eu

Re: DSA Comments to Public Consultation on the Draft RSPG Opinion on ITU-R World Radiocommunication Conference 2023

Dear Sir/Madam,

The Dynamic Spectrum Alliance ("DSA") appreciates the opportunity to provide comments to the Radio Spectrum Policy Group's ("RSPG") draft Opinion on the ITU-R World Radiocommunication Conference 2023 ("WRC-23").

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]

DSA's comments are limited to the 6 425 – 7 125 MHz band under WRC-23 AI 1.2.[2] **The DSA urges RSPG to adopt Option 2 on the band 6 425 – 7 125 MHz – "No IMT identification"**. It appears from sharing studies that sharing is not possible between IMT (including macro base stations) and services to which the frequency band is allocated on a primary basis, ensuring their protection, without imposing additional regulatory or technical constraints on those services, and also, on services in adjacent bands.

[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.

[2] WRC-23 agenda item 1.2: to consider identification of the frequency bands 3 300-3 400 MHz, 3 600-3 800 MHZ, 6 425-7025 MHz, 6 425-7 025 MHz and 10.0-10.5 GHz for International Mobile Telecommunications (IMT), including possible additional allocations to the mobile service on a primary basis, in accordance with Resolution 245 (WRC-19) https://www.itu.int/en/ITU-R/study-groups/rcpm/Pages/wrc-23-studies.aspx, last accessed August 2022).

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An IMT identification would limit the flexibility of European regulators to authorize license-exempt Wireless Access Systems / Radio Local Area Networks (WAS/RLAN) in the future as it send a strong signal to all stakeholders that the band should be licensed in the near-term and regulators need to initiate plans to clear and relocate existing users currently operating in the band – a process that will take years to complete, disrupt operations of incumbents, and cost European governments untold millions of EURs. Alternatively, WAS/RLAN operations in the 6 425 – 7 125 MHz range would allow Fixed Service and Fixed Satellite Service incumbents to continue current operations without any constraints and allow these services to grow, while providing significant socio-economic benefit to Europe at large.

The DSA includes as an attachment to these comments a report produced by LS Telecom and Valdani Vicari & Associati (VVA) entitled "*Socio-economic benefit of IMT versus RLAN in the 6425-7125 MHz band in Europe*".[3] The study examined the following three scenarios that presents the technical and economic benefits of utilizing the 6 425 – 7 -125 MHz frequency range: (1) Licensed urban and suburban 5G use of the 6 425 – 7 125 MHz (within a national license but omitting macrocell use, which is unlikely to be permitted), (2) Local licensed 5G use of the 6 425 – 7 125 MHz band, and (3) RLAN use of 5 925 – 6 425 MHz versus use of the entire 5 925 – 7 125 MHz band. The overall conclusions of this study have found that it is more beneficial to Europeans from both a technical and economic perspective to adopt RLAN for use in the 6 425 – 7 125 MHz band.[4]

Link with EU policies: The EU Should Take a Neutral Approach Supporting All Gigabit Technologies That Can Meet its Broadband Targets, Including WAS/RLAN and Satellite

As stated in the consultation document, "European Electronic Communications and Connectivity policy is aiming at ubiquitous ultra-high broadband connectivity for all European citizens and fostering innovative applications in the single market".[5] And while "5G will be one of the most critical building blocks of the European digital economy and society in the next decade",[6] it is but one critical building block. There are other critical building blocks that can provide ultra-high broadband connectivity in Europe that should receive full consideration by RSPG.

[3] LS Telecom and Vaidani Vicari & Associates, "Socio-economic benefits of IMT versus RLAN in the 6425-7125 MHz Band in Europe", released 1 August 2022, http://dynamicspectrumalliance.org/wp-content/uploads/2022/08/DSA-IMT-RLAN_6425-7125MHz-EU_Study-August-2022.pdf

[4] LS Telecom Report at pages 6-8.

[5] Section 4.1.1. of the RSPG Draft Opinion.

[6] *Id.*

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The DSA believes that the best way to achieve the gigabit connectivity targets for residents and businesses in Europe is through a holistic approach that would require recognizing and equally encouraging all the gigabit technologies that will be required in the EU in the next decade, including 5G, but also fibre, coax cable, satellite, fixed wireless access, and the latest generations of license-exempt technologies such as Wire Access Systems / Radio Local Area ("WAS/RLAN") Networks, of which Wi-Fi is the most prominent example.

An approach to connectivity that exclusively focuses on 5G but that is silent on other gigabit broadband access technologies which can highly contribute to the availability of affordable and innovative services in the EU, does not fully recognize Europe's digital future. Particularly, such an approach does not consider the need for in-house, in-office or in-company connectivity which however is a necessary complement to the connectivity up to the network termination point. The availability of Wi-Fi across the entire 5 925 – 7 125 MHz range in combination with other gigabit technologies will allow for Europeans to have gigabit connectivity to their user device of choice, whether indoors or outdoors.

WAS/RLAN technologies are the cornerstone of gigabit connectivity in Europe. Today, as broadband speeds available to residential users are gradually increasing towards that goal, the link from a Wi-Fi access point to a user's Wi-Fi enabled device can develop into a bottleneck. It means that end users cannot benefit from such gigabit infrastructure without adequate local connectivity, which means WAS/RLAN resourced with an appropriate amount of spectrum. This is particularly apparent in households and enterprises where there are multiple users, each operating multiple Wi-Fi enabled devices at the same time. This trend became more evident globally during the time of the COVID pandemic. As parents worked from home and children studied remotely, there were often multiple video conference applications active on multiple devices concurrently.

There is an insufficient amount of spectrum in the 5 GHz band in Europe to meet forecasted demand for licence-exempt Wi-Fi access as most sub-bands are either not available on a European-wide basis or come with significant restrictions attached to protect incumbents. Even the additional 480 MHz recently opened in the 6 GHz band will not be able to fully satisfy the future demand for local wireless connectivity capacity and will not provide enough channels of 160 MHz or even 320 MHz of bandwidth that will be supported by the latest generations of Wi-Fi, namely Wi-Fi 6E and Wi-Fi 7 and that will be needed by innovative applications such as augmented, virtual and mixed reality . In acknowledgment of this demand, Europe should open the 6425-7125 MHz band for technology-neutral licence-exempt use by Wi Fi 6E, Wi-Fi 7, 5G NR-U that can share the band with other incumbent technologies.

Currently, European mobile network operators greatly benefit from Wi-Fi's capacity to offload traffic from cellular mobile devices; if this capacity were not available, IMT/5G networks would be more

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costly, as mobile operators would need to deploy many more small cells in dense urban areas to offer gigabit throughput and provide adequate quality of service, and this would be to mobile users only. Because of the attenuation of signals from outdoor 5G base stations (building entry loss), 5G indoor coverage and performance would be severely limited. Providing 5G gigabit connectivity indoors would require the deployment of a completely new infrastructure, parallel to the existing Wi-Fi one which will be prohibitive from both a commercial and an environmental point of view.

Unfortunately, unlike IEEE standards-based devices such as Wi-Fi that incorporates a contention-based mechanism, 3GPP standards-based IMT devices are not designed to share the spectrum. As a practical matter, the EIRP levels proposed for IMT base stations operating in the 6 425 – 7 125 MHz band for the most significant use case will overwhelm Wi-Fi receivers within range operating co-channel and on first adjacent channels, which in most instances will be located in residences. While, in theory, a politically satisfying solution could be that IMT technologies are limited to outdoor use in the band and WAS/RLAN are limited to indoor use, the IMT power levels would have to be reduced significantly. It is unclear how this would impact the utility of the proposed IMT use cases in the 6 425 – 7 125 MHz band. The potential competition issue under this scenario that may arise, of course, is that over time consumers would have no option but to adopt a new indoor IMT infrastructure that parallels the existing (license-exempt) Wi-Fi one.

Some parties may argue that the portion of the band above 6425 MHz should be reserved for possible IMT use, or that IMT technologies "require" 6 GHz band spectrum, but the arguments do not stand up to scrutiny. The IMT community's mid-band spectrum advocacy for many years has focused on spectrum in the 3 GHz range. For much of the last decade, the IMT community has advised governments globally that it is essential to make available 100 MHz per operator in this 3 GHz range to support 5G needs as well as spectrum in the millemetre waves bands. Administrations did not identify any portion of the 6 GHz as a pioneer band for 5G, and the IMT community did not even mention the 6 GHz band for their 5G needs.

In 2019, GSMA, in a publication directed to operators about why they should care about 5G, stated the following:

> *"5G networks require access to spectrum in low, medium and high radio frequencies and in larger contiguous blocks than previous mobile generations require. Regulators that get as close as possible to assigning 100 MHz per operator in 5G mid-bands (e.g. 3.5 GHz) and 1GHz per*

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> *operator in millimetre wave bands (e.g., 26GHz and 28GHz) will best support robust 5G services."*[7]

Notably, GSMA did not raise the 6 GHz band frequencies, and failed to list the 6 GHz band in its exhaustive appendix of "5G New Radio Spectrum Bands." The IMT community's actions over the last decade on the 6 GHz band, or rather its inaction, speak far louder than GSMA's recent hyperbolic press release describing the allocation of 6 GHz for license-exempt use a "clear threat to 5G". Regulators and policymakers globally have gone to great lengths to provide the 3 GHz mid-band spectrum that the cellular industry has long said was the critical enabler for 5G. Regulators have also responded by making available high-band spectrum to the mobile industry, most of which lies fallow today. The IMT industry should act to meet its promises for 5G with the spectrum that has been made available, not to claim that 6 GHz licensed spectrum is suddenly critical to enable 5G operations. Such claims ring hollow.

Consequently, DSA commissioned LS Telecom and VVA to better understand the socio-economic benefits of IMT versus RLAN technologies in the 6 425 – 7 125 MHz band in Europe. A summary of the interim study findings is presented below.

The LS Telecom Study Interim Results Indicate That It is More Beneficial From Both a Technical and Economic Perspective to Adopt RLAN For Use in the 6 425 – 7 125 MHz Frequency Range

The study examined the following three scenarios that presents the technical and economic benefits of utilizing the 6 425 – 7 125 MHz

- Scenario 1: Licensed urban and suburban 5G use of 6 425 – 7 125 MHz band
- Scenario 2: Local licensed 5G use of 6 425 – 7 125 MHz band
- Scenario 3: RLAN use of 5 925 – 6 425 MHz band versus using the entire 5 925 – 7 125 MHz band

In each scenario LS Telecom and VVA considered the technical benefits and made a comparison for utilizing the 6 425 – 7 125 MHz band. The specific technical benefits in this case include the Quality of Service (QoS), which is the ability to deliver a certain user throughput and capacity. This approach enabled a comparison to be made between existing 5G bands and 6 425 – 7 125 MHz for Scenarios 1 and

[7] *THE 5G GUIDE: A Reference for Operators, GSMA Intelligence, published April 2019 at page 257,* https://studylib.net/doc/25387786/the-5g-guide-gsma-2019-04-29-, last accessed August 2022.

2. For example, the technical analysis examines the potential benefits, such as improvement in Quality of Service, when deploying the 6 425 – 7 125 MHz for wider area licensed 5G compared to existing 3.4-3.8 GHz services. In Scenario 3, LS Telecom and VVA examined the difference between capacity benefits of RLAN operation in 5 925 – 6 425 MHz band versus access to the entire 5 925-7 125 MHz band. The output from the technical analysis informs the costs and benefits of implementing each technology and authorization approach.

The economic analysis comprises three primary areas to determine the costs and benefits of using the 6 425 – 7 125 MHz band across the different scenarios including:

- **Investment quantification**: investment costs per scenario (cost of implementation using the technical study outputs e.g., number of cells, with additional references) for all 3 scenarios and find out what it enables in terms of applications.

- **List of applications triggered per scenario**: based on a combination of technical and market factors, a Multi Criteria Analysis was developed to show the delta benefits of enabled connectivity for each of the scenarios.

- **Investment QoS ratio:** a quantification of the overall investment cost vs. the updated QoS delivered for the three scenarios. The technical analysis has, in this interim version of the report, considered the use of small cells for the 6 425 – 7 125 MHz for the nationwide licensed IMT scenario. In the final report, LS Telecom and VVA will include an analysis of macrocells using the 6 425 – 7 125 MHz band to deliver a combination of coverage and capacity that aligns with the 3.5 GHz band. The analysis will also consider the cost of upgrading existing 5G (3.5 GHz) macrocells across EU cities for a range of scenarios, under the assumption that the number of sites are fully upgraded over time.

The study concluded that it is more beneficial from both a technical and economic perspective to adopt RLAN for use in 6 425 - 7 125 MHz band. The 6 425 – 7 125 MHz band can offer both technical and economic benefits across both IMT and RLAN technologies. However, when considering the technologies in the context of expected additional investment for deployment, notably for IMT and resulting additional benefits, LS Telecom and VVA found that the case for IMT use in the upper 6 GHz band does not look as strong when compared to use for RLAN.

The summary of the results for each of the three scenarios is provided below:

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- **Scenario 1** (National licensed wide area IMT) will require a large initial investment to reach a significant amount of the EU population, while effectively addressing limited use cases. The economic analysis has highlighted that around 30 percent of the EU population is living in core urban centres, covering around 1.2 percent of EU area. Providing IMT WAN connectivity in the 6 425 – 7 125 MHz band over such area will require nearly 2.5 million cells, for a total cost of nearly 73 billion EUR. When looking at user requirements from downstream sectors mentioned in the Digital Decade[8], it was hard to identify strong arguments supporting this scenario. Agriculture is the only sector, out of six, that will outperform other scenarios on the technical level of fitness. Few downstream applications using the 6 425 – 7 125 MHz band are expected to take place in an outdoor environment with urban area coverage requirements. When it comes to the effective impact of this scenario, in terms of additional throughput delivered to end-users, deploying such connectivity in the upper 6 GHz band will provide an added value to densely urbanised areas. It will indeed be possible to address the mobile connectivity needs of nearly two times more users within a given area, such as densely urbanised areas, since the deployment and user-demand threshold are expected to be met in such areas, compared to the baseline.

- **Scenario 2** (Local licensed IMT) is expected to be deployed for sectors requiring localised additional connectivity (Construction, Healthcare, Manufacturing, Ports, Airports, etc.). The study identified 18,557 potential campus networks for deployment across the EU. Considering a variable number of cells depending on the area (e.g., an average of 8 cells for each campus in the healthcare sector), the study has conservatively estimated that the overall deployment cost will be around 12 Billion EUR. Regarding downstream applications, Scenario 2 enables a wider range of applications across sectors compared to Scenario 1. Local IMT in the 6 425 – 7 125 MHz band will not meet the requirements of the public sector; however, it will offer a reliable solution for three out of six sectors mentioned in the Digital Decade (Construction, Healthcare, Manufacturing). The study has assessed that this scenario will not support additional users under the 6 425 – 7 125 MHz band compared to the baseline scenario in 3800-4200 MHz.

- **Scenario 3** (RLAN/Wi-Fi 6E and 7) has been modelled based on three deployment scenarios. These scenarios, ranging from business as usual to extremely dense Wi-Fi penetration rates, has allowed an estimation of different developments in broadband subscriptions. The study has estimated that for domestic users, the cost of deployment will be based on the price of a new router for each subscription (a conservative approach since some routers could potentially be updated with a firmware update). From a downstream point of view, Scenario 3 enables a comparable, but still

[8] Europe's Digital Decade: digital targets for 2030 | European Commission (europa.eu) (last accessed August 2022).

higher number of applications vis-à-vis Scenario 2 (Local IMT). It is very well suited for five, out of six, sectors mentioned in the Digital Decade.[9] Outdoor use of Wi-Fi in Agriculture scores lowest since most outdoor applications are not expected to rely on RLAN. The study has assessed that Wi-Fi 6E/7 deployment will cover from 3 to 4 times more users compared to currently deployed Wi-Fi. Whilst Agriculture is mainly an outdoor activity, the storage and processing of the crops often takes place indoors and mainly utilises Wi-Fi. There are many aspects of Agriculture currently being served by Wi-Fi and will continue to be, but the study concentrates mainly on outdoor activities that could conceivably be undertaken by both RLAN and IMT to attain a like-by-like comparison.

Conclusion

DSA strongly recommends that RSPG and European Commission uses this opportunity of developing a recommendation for the EU position on 6 425 – 7 125 MHz at WRC-23 to more broadly consider the role played by different technologies, such as fibre, satellite, Wi-Fi, etc., as part of a diversified broadband ecosystem that can meet gigabit connectivity targets. Such an approach would be essential to ensure an effective implementation of the guiding European principle of technology neutrality. Thus, the only choice that supports technology neutrality for gigabit connectivity in the 6 425 – 7 125 MHz band is Option 2 – No IMT identification.

Thanks to its low cost and easy deployment, Wi-Fi is thus a perfect complement to fibre and 5G and a main contributor to ensuring that the promise of digitalization reaches all Europeans, especially citizens and small businesses such as start-ups and SMEs. Wi-Fi and 5G are in essence complementary technologies, both necessary to provide European citizens with the wireless experience expected in a truly digital gigabit society. The LS Telecom and VVA study clearly showed the increased socio-economic benefits to Europeans if the 6 425 – 7 125 MHz band is made available for Wi-Fi rather than IMT technologies.

When it comes to the ambition to leverage 5G in Europe, we are convinced that the identification of the 6 425-7 125 MHz band for IMT will not fulfil that purpose. Currently, this band is widely used by fixed services and fixed satellite services. If Europe would support IMT identification in the upper 6 GHz band under Agenda Item 1.2 at WRC-23 and ITU Region 1 were to identify the band for IMT, there is a danger that Europe would be left trailing behind other parts of the world in terms of broadband connectivity and innovation. Whereas the Wi-Fi ecosystem has already certified hundreds of devices that can operate across the 5 925-7 125 MHz band and the market has already seen large Wi-Fi 6E deployments, the IMT

[9] The six sectors are Agriculture, Construction, Education, Public Services, Healthcare and Manufacturing.

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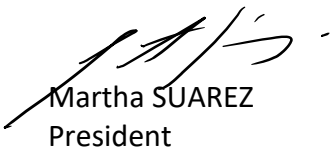
ecosystem would have to invest considerable time and resources to develop and deploy compatible devices in the 6 GHz band, following lengthy and complex licence assignment processes and the several years required to clear the band of incumbents.

Respectfully submitted,



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