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Cisco Comments on RSPG Consultation

Opinion on the ITU-R World Radiocommunication Conference 2023 --

RSPG22-014 FINAL

Cisco welcomes the opportunity to comment on the Radio Spectrum Policy Group's draft opinion on the ITU-R World Radio Communication Conference 2023.[1] We limit our comments to the draft opinion's discussion of WRC-23 Agenda Item 1.2 -- International Mobile Telecommunications (IMT) mid-band identification and the possible IMT identification of the 6 425-7 125 MHz band (the upper 6 GHz band).[2] Cisco urges the RSPG to endorse Option 2 – "No IMT identification."

Cisco recently discussed this topic in its comments on the European Commission Call for Evidence for an Initiative – "World Radio Conference 2023—EU Position."[3] Those comments are attached. As discussed therein, Cisco submits that identifying the upper 6 GHz band for IMT would undermine the EU's efforts to ensure all its citizens have full access to the products and services that will run on next-generation broadband services that will exceed 20 Gbps, harmonize the EU with adversary countries rather than its economic and national security partners, and raise questions about the EU's commitment to reduce climate change and increase sustainability.

While our previous comments focused on the relationship between Agenda Item 1.2 and the EU's stated broadband and sustainability goals, we take this opportunity to directly address some of the key points made in the draft RSPG opinion. The document begins with the

[1] Radio Spectrum Policy Group, "Opinion on the ITU-R World Radiocommunication Conference 2023 [DRAFT]," RSPG22-014 FINAL (07 June 2022) (RSPG Draft Opinion).

[2] *Id.* at 6-9.

[3] Cisco Comments on European Commission Call for Evidence for an Initiative, "World Radiocommunication Conference 2023—EU Position" (July 26, 2022) (Cisco EC Comments) (attached).

presumption that there is "additional spectrum demand in mid-band for IMT."[4] We respectfully disagree.

In fact, European use of, and demand for, IMT is less than that of other economies that have opted to support next generation fiber networks by allocating the entire 6 GHz band to unlicensed technologies. While seeking 5G coverage in all populated areas by 2030 is a laudable goal for the EU that Cisco fully supports, reports from service providers and multiple European regulators confirm that mobile networks carry only a small fraction of internet traffic.[5] Studies show that the EU has a strong preference for fixed broadband and has a lower adoption of 5G compared to other major economies. Despite being available to 62 percent of the population, the uptake of 5G in Europe accounts for only 2.8 percent of its total mobile connections, compared to 13.4 percent in the United States and 29.3 percent in South Korea[6] -- countries that have prioritized the upper 6 GHz band for fiber/Wi-Fi over additional 5G capacity.

Like people in the US and Korea, when given a choice, Europeans prefer fixed connectivity to meet their broadband capacity needs, as it provides the fastest and most reliable broadband connection.[7] And more European consumers can now experience connectivity beyond the capabilities of wireless access.[8] Late last month, the European Commission released the results of its 2022 Digital Economy and Social Index (DESI).[9] That report finds that the number of European households with access to fibre-to-the-premises (FTTP) or cable DOCSIS 3.1 increased significantly during 2021, even in rural areas. Another recent study found that by the end of 2022, six out of 10 European households will have access to full-

[4] RSPG Draft Opinion at 6.

[5] Dynamic Spectrum Alliance, "How Do Europeans Connect to the internet" at 9-11 (2022), *available at* http://dynamicspectrumalliance.org/wp-content/uploads/2022/06/DSA-WhitePaper-How-do-Europeans-connect-to-the-Internet.pdf.

[6] European Telecommunications Network Operators' Association, State of Digital Communications 2022 (February 2022), *available at* https://www.etno.eu/downloads/reports/state_of_digi_2022.pdf.

[7] The theoretical top fiber speeds in Europe far exceed those achievable by 5G (100/100 Gbps versus 20/10 Gbps). Kevin Thomas and Luke Edwards, "5G vs fibre - Will 5G replace fibre broadband?," 5G.co.uk (March 23, 2022), *available at* https://5g.co.uk/guides/5g-vs-fibre-broadband/.

[8] *See, e.g.,* Kelly Hill, "'The physics of fixed wireless cannot serve the demand': AT&T's Jeff McElfresh on the case against leading with FWA," RCR Wireless News (June 27, 2022), *available at* https://www.rcrwireless.com/20220627/carriers/the-physics-of-fixed-wireless-cannot-serve-the-demand-atts-jeff-mcelfresh-on-the-case-against-leading-with-fwa.

[9] European Commission, 2022 Digital Economy and Social Index (rel. July 28, 2022) (2022 DESI Report), *available at* https://digital-strategy.ec.europa.eu/en/policies/desi. Specifically, "FTTP coverage grew from 43% in 2020 to 50% in 2021, while DOCSIS 3.1 coverage increased from 28% in 2020 to 32% in 2021. Rural fixed VHCN coverage also improved from 29% in 2020 to 37% in 2021." 2022 DESI Report at 15.

fiber networks.[10] More than half of European households with access to fiber broadband service adopt this option.[11]

As discussed in our EC Comments[12], these high-speed connections to homes and businesses necessarily demand high-speed wireless connectivity within those premises. Over 90 percent of European data usage takes place indoors, and Wi-Fi ensures that billions of connected devices make the most of their broadband service. 92 percent of European broadband traffic is relayed via Wi-Fi – not cellular service -- once it enters a building.[13] Even mobile devices rely heavily on Wi-Fi. More than 80 percent of mobile device traffic originates or terminates indoors on Wi-Fi.[14] As a result, Wi-Fi traffic has doubled every 3 years, and the existing 2.4 GHz and 5 GHz Wi-Fi bands are quickly becoming congested, putting at risk Europe's technological leadership and the ability of European citizens to take advantage of their high-speed fiber connections.[15]

Despite the popularity and capabilities of fiber, IMT advocates argue that only more spectrum can address Europe's broadband needs. They now seek 2,000 MHz of mid-band spectrum[16] to meet the same requirements they previously claimed would be addressed with 80-100 MHz of mid-band spectrum per operator.[17] This new ask seeks to reserve 75 percent of mid-band mobile spectrum for the provision of less than 10 percent of wireless internet capacity. Cisco does not suggest that MNOs should only get 10 percent of the available spectrum, but we submit that the current 40 percent allocation should not increase until the IMT industry identifies use cases in which outdoor coverage could not be achieved via densification and millimeter wave spectrum -- as originally envisioned for IMT 2020.

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[10] Ferdinand Nijboer and Jan Frederik Slijkerman, ING, "Telecom Outlook: Fibre roll-out to Reach 60% of European Households in 2022," (Jan. 28, 2022), *available at* https://think.ing.com/articles/fibre-roll-out-to-reach-60-of-european-households-2022.

[11] *Id.*

[12] *See* Cisco EC Comments at 3-4.

[13] Dynamic Spectrum Alliance, "How Do Europeans Connect to the internet" (2022), *available at* http://dynamicspectrumalliance.org/wp-content/uploads/2022/06/DSA-WhitePaper-How-do-Europeans-connect-to-the-Internet.pdf.

[14] Dynamic Spectrum Alliance presentation, "6 GHz Band for Wi-Fi: Source of value for consumers, industry, GDP and social impact" (June 2022) (6 GHz Band for Wi-Fi) (attached to Cisco EC Comments).

[15] Dynamic Spectrum Alliance, "Lessons from the Assia Report on 'Wi-Fi and Broadband Data'" (October 2021), *available at* http://dynamicspectrumalliance.org/wp-content/uploads/2021/11/Lessons-from-the-Assia-Report-on-Wi-Fi-and-Broadband-Data.pdf.

[16] *See, e.g.*, GSMA, "The Importance of 6 GHz for 5G's Future" (Aug. 1, 2022), available at https://www.gsma.com/spectrum/resources/6-ghz-for-5g/.

[17] GSMA, "GSMA: 5G at Risk if Mobile Operators Don't Get Access to the Right Spectrum" (November 5, 2018) ("Regulators that make available 80-100 MHz of spectrum per operator in prime 5G mid-bands (e.g. 3.5 GHz) and around 1 GHz per operator in vital millimeter wave bands (i.e. above 24 GHz), will best support the very fastest 5G services.").

Many European countries do not appear to share the view that more IMT spectrum is urgently needed. While the RSPG draft opinion lauds the numerous IMT mid-band spectrum allocations in the last few years and suggests that there "may be additional spectrum requirements for future development,"[18] numerous European countries have yet to assign to assign even the most important bands for 5G applications.[19] As the 2022 DESI Report states, "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."[20]

Even for the IMT spectrum that has been assigned, many of the allocated mid bands still have not been put into 5G service. The 2022 DESI Report notes that, while the EU has very high wireless service coverage, that coverage is primarily accomplished through "spectrum sharing on the basis of 4G frequencies or low band 5G spectrum (700 MHz), which does not yet allow for the full deployment of advanced applications."[21] Moreover, though IMT supporters assert that 5G spectrum will be used for advanced technology and innovations, European IMT capacity has predominantly been used for free video streaming services like YouTube.[22] Rather than reserving valuable mid-band spectrum for IMT service providers at the expense of fibre/Wi-Fi networks that can serve consumers, factories and hospitals at the same time, the RSPG should consider encouraging service providers to adopt technological solutions like network slicing to increase efficient use of existing spectrum for critical outdoor services, while allowing free video services to continue to operate at slightly lower resolution during busy periods.

As explained above, the RSPG draft opinion's assumption that IMT needs additional mid-band spectrum is contradicted by the facts. Instead of allocating still more spectrum for IMT capacity, European regulators should focus their efforts on expanding the capabilities of Wi-Fi -- the service most widely adopted by their citizens. Technological progress and consumer demand inevitably lead to new devices and use cases demanding even better speed and latency, making fiber paired with Wi-Fi throughout the 6 GHz band necessary to the EU's goal – as stated in the RSPG draft opinion -- of achieving "ubiquitous ultra-high broadband connectivity for all European citizens and fostering innovative applications in the single market."[23]

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[18] RSPG Draft Opinion at 7.

[19] *See, e.g.*, European Commission, European 5G Observatory, "5G Observatory Quarterly Report 16" at 29-30 (July 2022), *available at* https://5gobservatory.eu/wp-content/uploads/2022/08/QR-16_Final_PDF.pdf (listing status of EU Member States' assignments of "pioneer bands").

[20] 2022 DESI Report at 16.

[21] *Id.*

[22] Cam Cullen, Sandvine, "YouTube Accounts for 35% of Worldwide Mobile internet traffic, Sandvine Says," (Feb. 28, 2019), *available at* https://www.sandvine.com/inthenews/youtube-accounts-for-35-percent-of-worldwide-mobile-internet-traffic.

[23] RSPG Draft Opinion at 7.

Beyond the question of whether additional IMT spectrum is necessary, we have other concerns about the draft RSPG opinion's assertions. For example, the RSPG draft opinion posits that the upper 6 GHz band "has similar propagation conditions to the band 3 400-3 800 MHz."[24] ITU sharing studies assume 70 percent indoor terminals, and this statement is simply not true for outdoor to indoor connectivity. In particular, the additional signal loss caused in this band by double-paned windows has been well acknowledged by administrations concerned with climate change. Ignoring the inconvenient truth that this band needs additional power to reach inside buildings is counter to the EU's green and digital ambitions, notably for the uptake of smart buildings, and must be taken seriously by the RSPG. At this critical time for our planet's future, the RSPG should not ignore physics simply because the issue has not made its way through the propagation expert group in the ITU in time for WRC-23 studies.

We also respectfully disagree with the RSPG draft opinion's statement that "even with an IMT identification, the EU remains flexible to exercise any relevant options in a future harmonization decision on the 6 425-7 125 MHz frequency band."[25] While this may be legally true, the realities of market economies dictate otherwise. Because of the long lead times and substantial investments necessary to produce communications equipment and applications, manufacturers and software companies must rely heavily on international allocation decisions in determining where to focus their resources. A decision to allocate the upper 6 GHz band for IMT would dramatically increase uncertainty and reduce the incentives for these companies to generate products for the European market.

And while the draft opinion suggests that sharing between IMT and WAS/RLAN is possible[26], this would require a fundamental rethink of 3GPP's 5G-NR. This is extremely unlikely to happen for the sake of a single band, for a discrete set of countries, in a single ITU Region. Moreover, service providers and their suppliers have already expressed their hostility to this concept. For example, IMT vendors and several European MNOs recently sought to have much of the section on sharing removed from the ITU's Future Technology Trends towards IMT-2030 report.[27]

The automated database sharing systems under development globally for 6 GHz, as recently demonstrated in Region 1[28], will be the best solution for sharing 6 GHz outdoors. Operators

[24] *Id.* at 6.

[25] *Id.*

[26] *Id.*

[27] *See, e.g.*, Telefon AB—LB Ericsson, "Proposed Updates for [Working Document Towards A] Preliminary Draft New report ITU-R M.[IMT.Future Technology Trends of Terrestrial IMT Systems Towards 2030 and Beyond]," ITU Radiocommunication Study Groups, Document 5D/1295-E at 20 (7 June 2022), *available at* https://www.itu.int/md/R19-WP5D-C-1295/en (proposing the deletion of discussion on the need for further work on spectrum sharing technologies).

[28] Communications and Information Technology Commission, "CITC Performs the First Global Live Demo of an End-to-End AFC System to Enable WiFi 6E Technology (July 8, 2022), *available at* https://www.citc.gov.sa/en/mediacenter/pressreleases/Pages/2022080701.aspx.

are perfectly able to use 5G-NRu or Wi-fi under this scheme for supplemental capacity in areas that have need.

The sharing issues in the upper 6 GHz band are not limited to IMT and WAS/RLAN. The draft opinion also understates the challenges associated with coexistence between IMT and fixed satellite services (FSS) in the band. The draft opinion states that "[i]t appears from sharing studies that there is possible opportunity for sharing between IMT (including macro base stations) and fixed satellite service allocated to this band."[29] Although the draft opinion does not identify the specific studies it references, we are concerned that the sharing studies between FSS and IMT in the upper 6 GHz band do not reflect the assumptions underlying the draft RSPG opinion.

Current sharing studies use the legacy network loading factor of 20 percent.[30] But that figure is not consistent with the RSPG draft opinion's assumption that future IMT demand will far exceed the capacity of current spectrum allocations and that the upper 6 GHz band will be heavily used to address this demand. We must assume that IMT operators will use state of the art 5G networks with antenna arrays and advanced scheduling that will have much higher base station transmission rates. Thus, the likely loading factor for the 6 GHz band will likely be far higher than the legacy 20 percent figure. The EU should not proceed with identifying the upper 6 GHz band for IMT without first reviewing FSS/IMT sharing studies that reflect the assumptions in the draft RSPG opinion, *e.g.*, a loading factor that reflects future 3GPP capabilities. If the assumptions underlying the draft RSPG opinion are correct, any other approach would risk significant interference to FSS from IMT operations.

Nor is this – as the RSPG draft opinion states – a "medium term" issue. Technological progress is accelerating, and today's spectrum allocation decisions will profoundly impact opportunities for near-term innovation and economic growth. European governments and operators are investing billions now to achieve next-generation connectivity for their citizens. Just last month, Nokia and a UK fiber-based broadband provider announced a plan to provide residential broadband at 10 Gbps symmetrical,[31] and one Swiss fiber-based broadband provider already advertises the same offering for its customers.[32] Even as millions of Wi-

[29] RSPG Draft Opinion at 6.

[30] ITU-R, "Characteristics of Terrestrial Component of IMT for Sharing and Compatibility Studies in Preparation for WRC-23 Annex 4.4 to Working Part 5D Chairman's Report (29 June 2021), *available at* https://www.itu.int/dms_ties/itu-r/md/19/wp5d/c/R19-WP5D-C-0716!H4-N4.04!MSW-E.docx.

[31] Ray Sharma, "Nokia, CityFibre Ink 10-Year Deal to Build 10 Gbps UK Broadband Network," The Fast Mode (July 26, 2022), *available at* https://www.thefastmode.com/technology-solutions/26471-nokia-cityfibre-ink-10-year-deal-to-build-10gbps-uk-broadband-network.

[32] *See* Salt, "The Best Fixed-Line Internet Access," *available at* https://fiber.salt.ch/en/home/internet?utm_source=besteabos&utm_medium=comparators. These speeds aren't limited to European countries. *See, e.g.,* Carl Weinschenk, "Lumen Looks for Speed Advantage with 8 Gbps Quantum Fiber Launch," telecompetitor.com (August 3, 2022), *available at* https://www.telecompetitor.com/lumen-looks-for-speed-advantage-with-8-gbps-quantum-fiber-launch/; Juha Saarinen, "Chorus Shows Off 25 gigabit per second retail fibre broadband," (May 28, 2022), *available at* https://www.crn.nz/news/chorus-shows-off-25-gigabit-per-second-retail-fibre-broadband-580604.

Fi6E devices come to market this year, the next Wi-Fi standard (Wi-Fi 7) could be released as early as 2024.[33] The combination of fiber broadband and Wi-Fi6E will transform the world's economies, as new applications in AR/VR and industrial automation use these capabilities to burst command and control information very quickly and achieve unprecedented efficiencies. Allocating the upper 6 GHz band for IMT could stifle Europe's participation in this ongoing technological revolution and significantly impact the Continent's economic growth now and for the foreseeable future.

Finally, an IMT identification for the 6 GHz band could threaten what the RSPG draft opinion describes as Europe's "significant steps to lead global developments towards this strategic technology [5G]."[34] As explained in our EC comments, new spectrum is useless without an equipment ecosystem. In response to decisions from some of the world's leading economies to allocate the entire 6 GHz band for RLAN, equipment manufacturers plan to ship more than 350 million Wi-Fi6E devices this year. By contrast, according to a recent report from GSMA, no 6 GHz IMT ecosystem currently exists. In fact, GSMA identifies only one country – China – as investing any effort in developing equipment and handsets for the band.[35] If the EU follows China's lead, it could be years before a secure IMT equipment ecosystem is available for the band. Cisco strongly encourages the RSPG to recommend against allying the EU with its international adversaries. Instead, the RSPG should recommend that the EU stand with other major economies in every region of the world and preserve the existing allocation for the upper 6 GHz band.

Cisco recognizes and appreciates the RSPG's important role in advising the EU on its positions for WRC-23. For the reasons stated above and in our EC Comments, Cisco strongly recommends that the RSPG support No Change for 6425-7025 and 7025-7125 MHz on Agenda item 1.2. If RSPG members continue to contemplate an IMT identification, however, we encourage them to address the following issues:

- Why can't outdoor 5G capacity needs in the 6 GHz use case be met with densification and the use of previously allocated high band spectrum, as originally proposed for IMT-2020?
- Consistent with the EU's sustainability goals, the double paned window issue should be studied to assess the impact on energy usage and, by extension, climate change that would result from using the upper 6 GHz band for outdoor to indoor coverage.

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[33] John R. Delaney, "Wi-Fi 7 Explained: Everything to Know About Tomorrow's Fastest Wireless Spec," PC Magazine (April 4, 2022), *available at* https://www.pcmag.com/how-to/wi-fi-7-explained-everything-to-know-about-tomorrows-fastest-wireless-spec#:~:text=When%20Will%20Wi%2DFi%207,as%20soon%20as%20late%202023.

[34] RSPG Draft Opinion at 7.

[35] GSMA, "The 6 GHz IMT Ecosystem: Demand Drives Scale" at 15 (August 2022), *available at* https://www.gsma.com/spectrum/wp-content/uploads/2022/08/6-GHz-IMT-Ecosystem.pdf. GSMA notably fails to mention the efforts by the only other major country interested in the 6 GHz band for IMT – Russia. *See* "Frequencies for 5G in Russia," TAdviser, *available at* https://tadviser.com/index.php/Article:Frequencies_for_5G_in_Russia.

- European study parameters must consider the functionality of future 5G systems. For example, the 20 percent network utilization factor cannot be used for European sharing studies simply because the number was already agreed to in the ITU in anticipation of low performance Russian and African deployments. Those studies must be based on parameters that reflect the use cases contemplated for future 5G systems in Europe and assume that future networks will be built using state of the art equipment.

If there are any questions, please contact the undersigned.

Respectfully submitted,

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Cisco Comments on European Commission Call for Evidence for an Initiative

"World Radiocommunication Conference 2023—EU Position"

Introduction

Cisco welcomes the opportunity to respond to the European Commission's call for evidence to develop the EU's position for the International Telecommunication Union (ITU) World Radiocommunication Conference 2023 (WRC-23). We believe it is an important opportunity to advance the future of connectivity in Europe in line with the Digital Decade Policy Programme.

With respect to WRC-23 Agenda item 1.2, Cisco urges the Commission to reject proposals to identify the 6 425-7 125 MHz band (the upper 6 GHz band) for International Mobile Telecommunications (IMT). Doing so would jeopardize the ability of citizens, governments, and industry to take full advantage of products and services that are being developed to run over next-generation broadband services, would align the EU with its ideological adversaries, and, without further study, would call into question the seriousness with which the European Commission addresses issues related to climate change when faced with industry lobbying.

Comments

I. The EU's Connectivity Goals Require Advanced Wi-Fi Connections

WRC-23 Agenda item 1.2 seeks "to consider identification of the frequency bands 3 300-3 400 MHz, 3 600-3 800 MHz, 6 425-7 025 MHz, 7 025-7 125 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)." For the reasons discussed below, Cisco urges the Commission to support no change in the identification of the upper 6 GHz band.

The COVID-19 pandemic has demonstrated that reliable high-speed broadband connectivity is essential to people's ability to work, learn, and stay connected with their communities. The EU has embraced that message with its "Path to the Digital Decade" objective, as recently described in a Provisional Agreement between the Council of Europe and the European Parliament:

> [B]y 2030, networks with Gigabit speeds should become available to those who need or wish to have such capacity. All Union end-users should be able to use at a fixed location Gigabit services provided by networks deployed up to the network termination point. Moreover, all the populated areas should be covered by a next generation wireless high speed network with at least 5G equivalent performance.[1]

This document also affirms the EU's commitment that this connectivity must reach all Europeans, regardless of their locations, not just those in urban centers.[2]

The EU has invested billions of EUR[3] to achieve these goals in a technologically neutral manner, focusing on network performance rather than favoring one type of technology over another.[4] Within the mix of available broadband technologies, fiber has become one of the fastest growing connectivity solutions. By the end of 2022, six out of 10 European households will have access to full-fiber networks,[5] which provide among the fastest and most

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[1] Council of the EU and European Parliament, Provisional Agreement, "Proposal for a Decision of the European Parliament and of the Council, Establishing the 2030 Policy Programme 'Path to the Digital Decade'" (rel. July 14, 2022) ("Provisional Agreement"). *See also* European Commission, 2030 Digital Compass: the European way for the Digital Decade (rel. March 9, 2021), *available at* https://eufordigital.eu/wp-content/uploads/2021/03/2030-Digital-Compass-the-European-way-for-the-Digital-Decade.pdf; European Commission, Path to the Digital Decade (rel. September 15, 2021), *available at* https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52021PC0574 ("By 2030, networks with gigabit speeds should be available at accessible conditions for all those who need or wish such capacity, and with all populated areas covered by 5G.").

[2] *See* Provisional Agreement ("…[R]eliable, fast and secure connectivity for everybody and everywhere in the Union, including in rural and remote areas, such as islands, mountainous and sparsely populated as well as outermost regions, is needed."). *See also* European Commission, Declaration on Digital Rights and Principles (rel. January 26, 2022), *available at* https://digital-strategy.ec.europa.eu/en/library/declaration-european-digital-rights-and-principles ("The recently adopted "Path to the Digital Decade" aims at further reinforcing our digital leadership and empowering citizens and businesses, thus making the digital transformation the engine of sustainable economic growth, and social well-being in Europe. **That will be achieved in particular by extending high-performance broadband access for all citizens including in rural and remote areas**….") (emphasis added). *See also* European Commission, A long-term vision for the EU's rural areas (rel. June 30, 2021), *available at* https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52021DC0345.

[3] EUR Recovery and Resilience Facility (RRF) identifies the digital transition as a key priority. Member states have allocated more than 26 percent of the total 723.8bn EUR in RRF funding towards the digital transition. *See* European Commission, "Recovery and Resiliency Facility," *available at* https://ec.europa.eu/info/business-economy-euro/recovery-coronavirus/recovery-and-resilience-facility_en.

[4] *See, e.g.*, Provisional Agreement ("all technologies and transmission systems able to contribute to the achievement of the Gigabit connectivity, including the current and upcoming advancements of fibre, satellite, 5G or any other future ecosystem and next generation Wi-Fi should be treated equally, when having equivalent network performance").

[5] Ferdinand Nijboer and Jan Frederik Slijkerman, ING, "Telecom Outlook: Fibre roll-out to Reach 60% of European Households in 2022," (Jan. 28, 2022), *available at* https://think.ing.com/articles/fibre-roll-out-to-reach-60-of-european-households-2022.

reliable broadband connections.[6] Because of these advantages, more than half of European households with access to fiber broadband service adopt this option.[7]

High-speed connectivity to the home necessarily demands high-speed connectivity within the home. Over 90 percent of European data usage takes place indoors, and Wi-Fi ensures that billions of connected devices make the most of their broadband service. 92 percent of European broadband traffic is relayed via Wi-Fi – not cellular service -- once it enters a building.[8] Even IMT relies heavily on Wi-Fi. More than 80 percent of mobile data traffic originates or terminates indoors on Wi-Fi.[9]

The widespread adoption of fiber and other advanced technologies will substantially increase the amount of traffic traveling across Wi-Fi connections within homes and businesses. Wi-Fi traffic doubles every 3 years, and the existing 2.4 GHz and 5 GHz Wi-Fi bands are quickly becoming congested, putting at risk the ability of European citizens to connect in a reliable manner and have a smooth experience.[10] Technological progress and consumer demand inevitably lead to new devices and use cases demanding even better speed and latency, making Wi-Fi throughout the 6 GHz band necessary to complement high-speed connections to homes and businesses. As MEP Josianne Cutajar (Malta) has said:

> We should promote an approach to connectivity that aims, first and foremost, to ensure the full coverage of all European households and business premises, regardless their location, by next generation networks (…). We should adopt a complementary approach that focuses on the final objective rather than a specific technology. **And Wi-Fi can play an important role in reaching this goal, especially when it comes to indoors connectivity**.[11]

Reserving the upper 6 GHz band for IMT would place a "thumb on the scale" for wireless service providers, violating the EU's principles of technological neutrality and creating a spectrum bottleneck at the network edge that will only grow worse over time. The EU's broadband connectivity needs are growing exponentially, and as explained below, IMT in the upper 6 GHz band cannot meet this moment.

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[6] The theoretical top fiber speeds in Europe far exceed those achievable by 5G (100/100 Gbps versus 20/10 Gbps). Kevin Thomas and Luke Edwards, "5G vs fibre - Will 5G replace fibre broadband?," 5G.co.uk (March 23, 2022), *available at* https://5g.co.uk/guides/5g-vs-fibre-broadband/.

[7] *Id.*

[8] Dynamic Spectrum Alliance, "How Do Europeans Connect to the internet" (2022), *available at* http://dynamicspectrumalliance.org/wp-content/uploads/2022/06/DSA-WhitePaper-How-do-Europeans-connect-to-the-Internet.pdf.

[9] Dynamic Spectrum Alliance presentation, "6 GHz Band for Wi-Fi: Source of value for consumers, industry, GDP and social impact" (June 2022) (6 GHz Band for Wi-Fi) (attached).

[10] Dynamic Spectrum Alliance, "Lessons from the Assia Report on 'Wi-Fi and Broadband Data'" (October 2021), *available at* http://dynamicspectrumalliance.org/wp-content/uploads/2021/11/Lessons-from-the-Assia-Report-on-Wi-Fi-and-Broadband-Data.pdf.

[11] Dynamic Spectrum Alliance, "6 GHz Band for Wi-Fi" (emphasis added).

II. IMT in the Upper 6 GHz Band Has Significant Technical and Logistical Issues

Cisco fully supports the EU's goal of ensuring that all Europeans have access to 5G-equivalent wireless service by 2030 and agrees that IMT provides an important connectivity option, particularly for use cases requiring outdoor or mobile capabilities. As explained above, however, the EU's broadband plans are likely to result in many homes and businesses receiving their next-generation service via fiber. In that event, the EU will need the upper 6 GHz band to carry traffic within homes and businesses. But the band is not well-suited for indoor IMT use because of its propagation challenges, which make it difficult for the spectrum to transmit from an outdoor base station to an indoor location.[12] Indeed, even the IMT service provider community clearly regards the upper 6 GHz band as an outdoor opportunity.[13]

But even as an outdoor-only technology, there are serious questions about how the identification of the upper 6 GHz band for IMT would support the EU's connectivity objectives. Because of the band's technical characteristics, transmissions in the upper 6 GHz band cannot travel the distances required for coverage of less densely populated areas. Thus, reserving the band for IMT will do little to achieve the EU's goal of ensuring that all European households, including those in rural and remote areas, have 5G coverage.

The IMT industry appears to concede this point. According to a 2020 GSMA study, the 6 GHz band (among others) is a "key 5G **capacity** [as opposed to coverage] resource. The upper mid-bands offer a good combination of propagation and coverage **for cities**."[14] This conclusion was recently affirmed in another study, which found that "the application of 6 GHz cells is most likely to be found in urban areas," and would be "mainly for specific congested outdoor locations in urban areas…."[15]

Even for densely populated areas, it's unclear whether dedicating the upper 6 GHz band for IMT operations makes technical, logistical, or financial sense. First, the deployments would be severely limited by existing incumbent operations. Any new operations in the upper 6 GHz band, whether RLAN, IMT, or some other technology, must accommodate existing fixed service (FS) microwave links, which are used for critical infrastructure, 5G backhaul, and

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[12] Policy Impact Partners and Dynamic Spectrum Alliance, "How to Realise the Full Potential of 6 GHz Spectrum: A White Paper," Figure 13 (September 2021), *available at* https://6ghz.info/wp-content/uploads/2022/02/6GHz-EMEA_White-Paper_Sept21-EN.pdf.

[13] Licensed 6 GHz Opportunity, White Paper, "6 GHz Opportunity: Licensed Spectrum for Mobile Networks" (June 2022) ("The use of the 6 GHz band for macro-cellular deployments is key to ensure a balance with the spectrum assigned for local area deployments."), *available at* https://6ghzopportunity.com/wp-content/uploads/2022/07/22-06-09-Licensed-6-GHz-opportunity-v3.pdf. *See also* LS Telecom *et al.*, "Socio-Economic Benefits of IMT Versus RLAN in the 6425-7125 MHz band in Europe" at 17 (June 7, 2022) (LS Telecom Study), *available at* http://dynamicspectrumalliance.org/wp-content/uploads/2022/06/DSA-Report-6425-7125-MHz-EU-Study.pdf.

[14] Coleago Consulting Ltd, "IMT spectrum demand – estimating the mid-bands spectrum needs in the 2025-2030 timeframe" at 5 (Dec. 14, 2020) (emphasis added), *available at* https://www.coleago.com/app/uploads/2021/01/Demand-for-IMT-spectrum-Coleago-14-Dec-2020.pdf.

[15] LS Telecom Study at 9, 17.

other services. The number of such links in the upper 6 GHz band throughout the EU could run into the tens of thousands. In fact, a recent study of IMT-FS coexistence in Germany[16] found that separation distances of as much as 200 km may be necessary in that country, which would require cross-border coordination and dramatically limit potential IMT deployments.

Second, it could be years before EU citizens receive any IMT service in the upper 6 GHz band, and only at tremendous expense. According to the LS Telecom Study, coexistence would be difficult for IMT and long-standing fixed satellite service (FSS) operations in the band.[17] Moving those FSS operations out of the band, however, could cost as much as 4.7 billion EUR and take years to complete.[18] That same study estimates that 5G deployments in the upper 6 GHz band could cost another 73 billion EUR – a massive expense that might necessitate EU assistance at the expense of other digital transition priorities.[19]

The lack of an IMT ecosystem would likely further delay service in the band. Nations around the world – including many EU allies and some of the largest economies in their regions -- are deploying RLAN – not IMT – throughout the 6 GHz band. Manufacturers have responded with a robust Wi-Fi ecosystem using the entire 6 GHz band and will ship more than 350 million Wi-Fi6E devices just this year. Among the larger economies, however, only China and Russia are seriously considering using this spectrum for IMT. If the EU follows the lead of these adversary states, it will have to wait for hardware manufacturers to devote the billions of EUR to produce an IMT ecosystem for the band, which could take years. While upper 6 GHz band lays fallow waiting for IMT service, citizens of other leading economies will receive the full benefits of RLAN throughout the 6 GHz band.

Even if these financial, economic, and logistical hurdles could be overcome, the proposed identification is not necessary. With WRC-23 about one year away, there has yet to be an official CEPT or EU study finding that the identification of the upper 6 GHz spectrum band is necessary to achieve the EU's connectivity goals. Indeed, many EU countries have yet to even assign their existing IMT spectrum. According to the 2021 Digital Economy and Society Index (DESI):

> At 31 August 2021, 56% of the EU harmonised radio spectrum for wireless broadband had been awarded across Member States…. Taking into account the

[16] Federal Republic of Germany, "Sharing Study for WRC-23 Agenda Item 1.2 on IMT/GS in 6 425-7 125 MHz," Document 5D/1273-E, ITU-R WP5D Meeting Documents (June 7, 2022) ("The worst-case simulation shows the necessary separation distances to protect the FS from interference can exceed 200 km. If the BS [base station] antenna is positioned inside the clutter (below rooftop) the necessary separation distances remain above 60 km. The results highlight that co-channel sharing between FS and IMT could become challenging in the 6 GHz band."). *See also* Federal Republic of Germany, "Working Document on Sharing and Compatibility Studies of IMT Systems in the Frequency Band 6 425-7 125 MHz, Document 5D/1198-E, ITU-R WP5D Meeting Documents (June 3, 2022) (concluding separation distances of 40km would be necessary to protect FS sites throughout Europe).

[17] LS Telecom Study at 8.

[18] *Id.*

[19] *Id.* at 7.

> above timeframes as well as the information gathered by the Commission, with relation to the administrative measures taken so far by Member States towards the fulfilment of the above obligations, **there is some concern about the delays in the implementation of EU law regarding the authorisation of radio spectrum for 5G**.[20]

The lack of many EU governments to move forward on existing allocated spectrum is consistent with the EU's slower uptake of 5G generally. Despite being available to 62% of the population, the uptake of 5G in Europe accounts for only 2.8% of its total mobile connections, compared to 13.4% in the United States and 29.3% in South Korea.[21]

Thus, there is no support for IMT advocates' claims that the upper 6 GHz band is needed to meet current or anticipated IMT demands. Absent such support, the Commission should not support reserving 700 megahertz of spectrum for the exclusive use of a small number of service providers, rather than preserving the availability of that spectrum for more than half a billion EU citizens.

III. IMT in the Upper 6 GHz Band Would Undermine the EU's Policy Goals to Preserve Our Climate and Bridge the Digital Divide

In addition, in advancing its sustainability and Net Zero goals, the Commission should consider the environmental and climate impact of dedicating the upper 6 GHz band for IMT. According to a recent ARCEP study, mobile networks consume 70 percent of the energy in a communications access network.[22] By contrast, fixed networks like fiber consume far less energy overall, "due to some extent to the fact that, contrary to radio equipment, fixed equipment's energy consumption depends relatively little on the amount of traffic they are relaying."[23]

The ITU has forecast that fixed networks around the world will transport more than 10 times the data carried by mobile networks but produce less than half the CO2e. Indeed, mobile networks around the globe will emit 92.0 Mt CO2e in 2025, compared to 41.8 Mt CO2e from fixed networks. Out of these figures, 73.0 Mt CO2e in mobile networks would be derived from energy consumption; the equivalent figure would be 35.2 Mt CO2e for fixed networks.

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[20] European Commission, Broadband Connectivity in the Digital Economy and Society Index Report 2021 (emphasis added), available at https://digital-strategy.ec.europa.eu/en/policies/desi-connectivity. *See also* Ookla, "5G in Europe: Reflecting on the Progress So Far and Mapping the Future" (Feb. 2022), available at https://www.ookla.com/articles/5g-europe-mapping-the-future-q1-2022 ("As per the EC 2016 5G Action Plan, countries across the EU were meant to make low-band spectrum available for use by June 30, 2020, and mid- and high-band spectrums by December 31, 2020. Yet four countries out of 30 analyzed have yet to assign spectrum. The delays related to spectrum assignment stem from multiple reasons ranging from the impact of COVID-19 on schedules to cross-border coordination with non-EU countries to weak demand from the operators' side.") (emphasis added).

[21] European Telecommunications Network Operators' Association, State of Digital Communications 2022 (February 2022), *available at* https://www.etno.eu/downloads/reports/state_of_digi_2022.pdf.

[22] ARCEP, "Achieving Digital Sustainability" (December 2020), p 11, *available at* https://en.arcep.fr/uploads/tx_gspublication/achieving-digital-sustainability-report-dec2020.pdf

[23] *Id.*

Considering the share of mobile data and fixed broadband lines in Europe, we can reasonably estimate that mobile networks will emit around 10.0 Mt CO2e in the EU from electricity consumption alone – that's more than double the amount emitted (4.8 Mt CO2e) from fixed networks.[24]

Moreover, as discussed earlier, dedicating the upper 6 GHz band for IMT would not only undermine the EU's environmental goals, but would also undermine its goal of connecting all Europeans with high-quality broadband service. The EU has clearly declared that all Europeans deserve access to the new technologies that will transform the way people work and live over the next decade. Without such access, Europe risks a new digital divide. As the Commission has stated:

> A new digital divide has also emerged, not only between well-connected urban areas and rural and remote territories, but also between those who can fully benefit from an enriched, accessible and secure digital space with a full range of services, and those who cannot. A similar divide emerged between those businesses already able to leverage the full potential of digital environment and those not yet fully digitalised. In this sense, the COVID-19 pandemic has exposed a new "digital poverty," making it imperative to ensure that all citizens and businesses in Europe can leverage the digital transformation for a better and more prosperous life. The European vision for 2030 is a digital society where no-one is left behind.[25]

The Commission has identified a wide variety of technologies that should be available to all Europeans. These include augmented and virtual reality (AR/VR), telehealth, and eEducation. But studies show that these technologies will require indoor connectivity that IMT in the upper 6 GHz band simply cannot deliver. For example, a wireless industry study explicitly concedes that "short-range personal area communications between smartphones and [AR/VR/XR] headsets will rely on [RLAN in the] licence exempt 5 GHz band (and the lower 6 GHz in some countries, as well as the high bands."[26] Another recent study concludes that education use cases like remote learning and connected schools, as well as health care use cases like telemedicine consultation and IoT solutions, are best addressed via RLAN in the upper 6 GHz band, not IMT.[27]

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[24] ITU, Recommendation ITU-T L.1470, "Greenhouse gas emissions trajectories for the information and communication technology sector compatible with the UNFCCC Paris Agreement" (Jan. 2020); *available at* https://www.itu.int/rec/dologin_pub.asp?lang=e&id=T-REC-L.1470-202001-I!!PDF-E&type=items

[25] European Commission, Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, "2030 Digital Compass: the European Way for the Digital Decade" (March 2021), *available at* https://eufordigital.eu/wp-content/uploads/2021/03/2030-Digital-Compass-the-European-way-for-the-Digital-Decade.pdf.

[26] *See* Licensed 6GHz Opportunity Report at 7.

[27] *See, e.g.*, LS Telecom Study at 66, 73.

Due to its affordability and extensive coverage, Wi-Fi continues to be the best technology for inclusive connectivity and closing the digital divide. The WiFi4EU initiative launched by the European Commission during the past mandate has been crucial in closing the digital divide by providing funding for EU municipalities to offer free Wi-Fi connectivity for citizens in public spaces, including parks, squares, libraries, health centres and museums.[28] But dedicating the upper 6 GHz band to IMT sharply reduces the ability of EU governments to make available the latest technologies at these public Wi-Fi opportunities, reinforcing the digital divide for the many citizens who rely on these resources.

Conclusion

The EU has taken bold steps towards bridging the digital divide, dedicating billions of EUR towards ensuring that every EU citizen has access to high-speed connectivity by 2030. Reserving the upper 6 GHz band for IMT, however, would undermine these efforts, widening the digital divide not only between urban and rural citizens, but between Europe and much of the developed world. Doing so would also undermine the ambitious climate and environmental targets the EU has adopted. The Commission should oppose Agenda item 1.2. and preserve the existing allocation of the upper 6 GHz band.

If there are any questions, please contact the undersigned.

Respectfully submitted,

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[28] See European Commission, WiFi4EU website, *available at* https://wifi4eu.ec.europa.eu/#/home.

ATTACHMENT

6 GHz BAND FOR Wi-Fi

Source of value for consumers, industry, GDP and social impact



DSA

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MARTHA SUAREZ

DYNAMIC SPECTRUM ALLIANCE

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Dynamic Spectrum Alliance

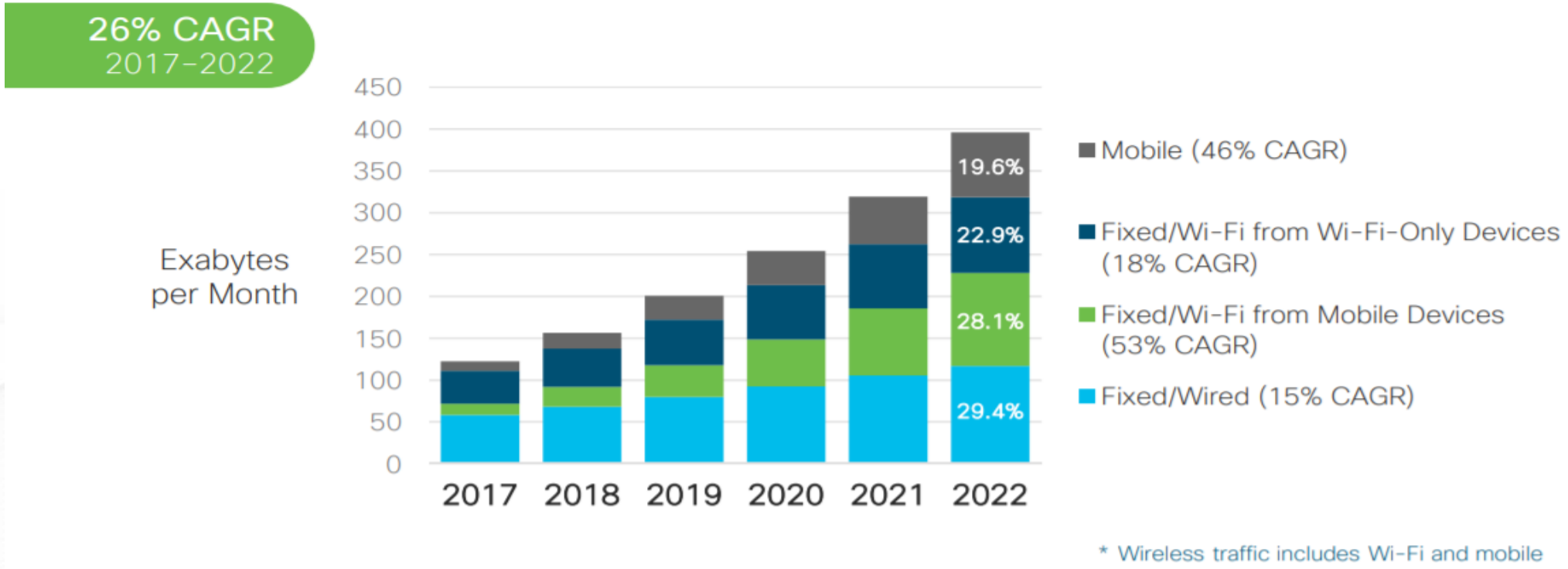
The Dynamic Spectrum Alliance (DSA) is a global, cross-industry, not for profit organization advocating for laws, regulations, and economic best practices that will lead to more efficient utilization of spectrum, fostering innovation and affordable connectivity for all.

DSA Members

Wi-Fi is Essential to Broadband

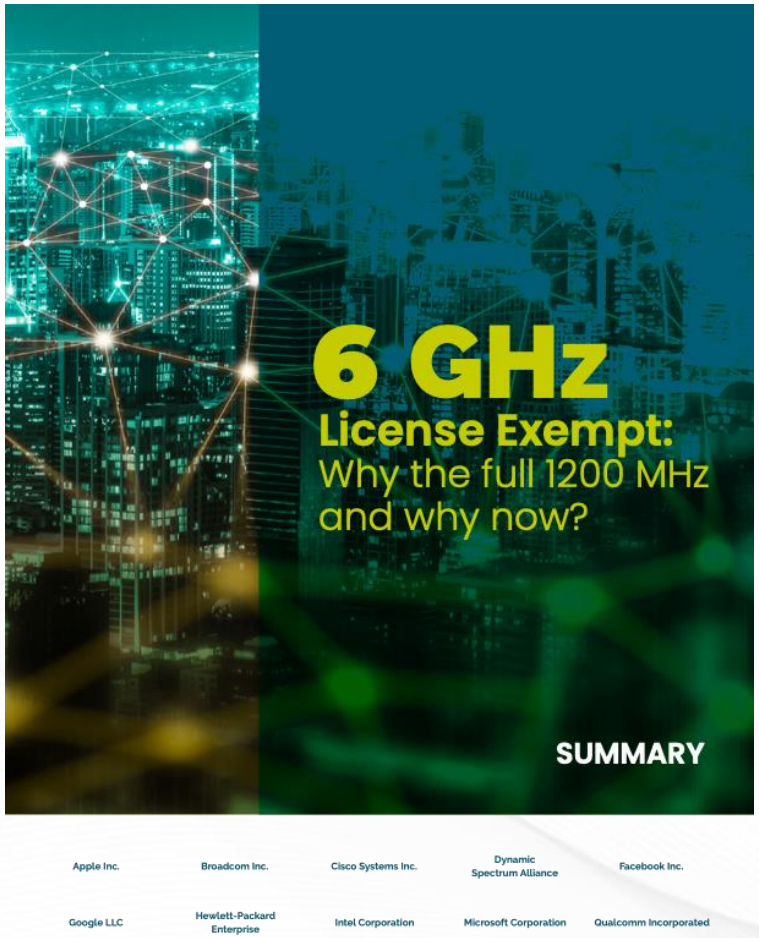
Global IP Traffic by Local Access Technology

By 2022, 71% of total IP traffic will be wireless*



Source: Cisco VNI

And the 6 GHz band is Essential to Wi-Fi



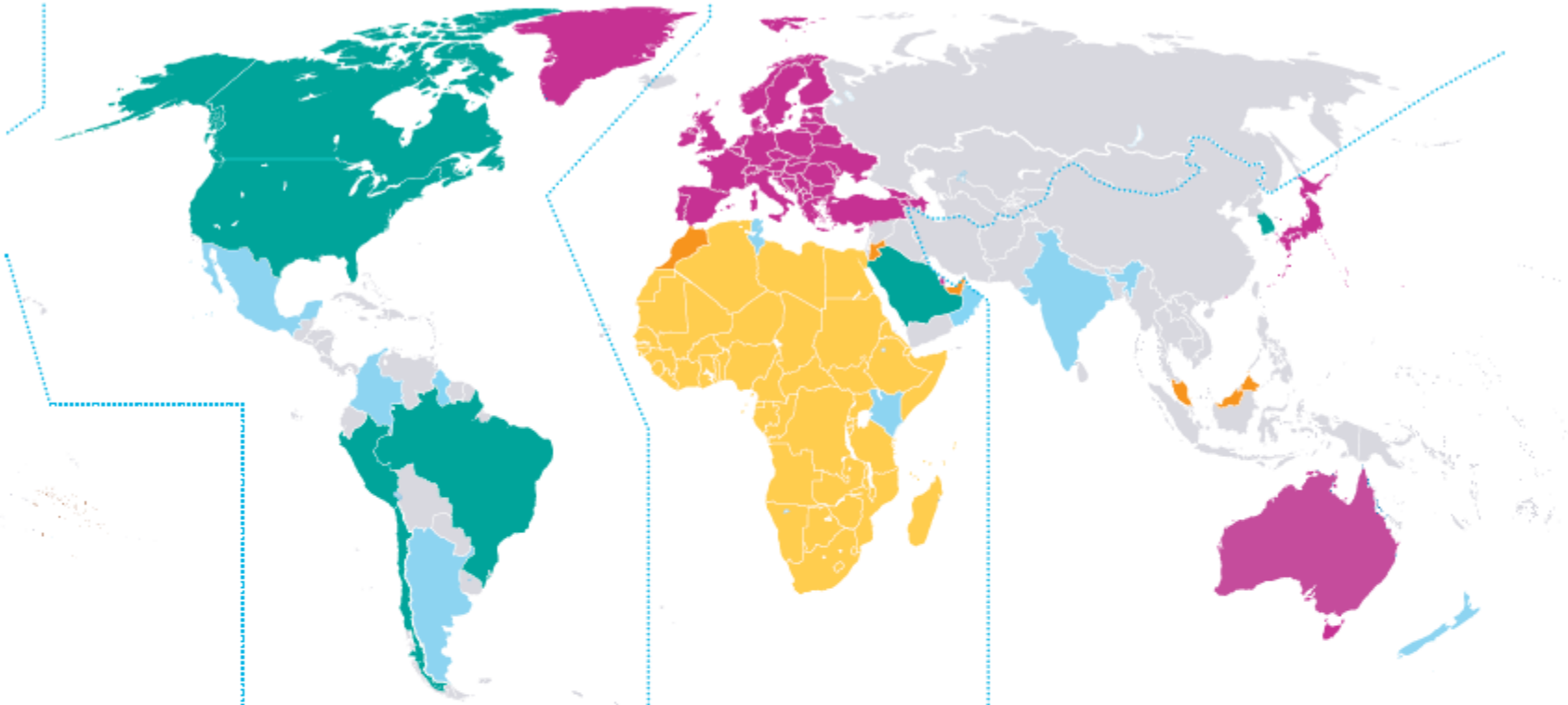
Available at:
Dynamic Spectrum Alliance webpage

http://dynamicspectrumalliance.org/resources/

And more information at:
https://6ghz.info/

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GLOBAL PROGRESS TOWARDS LICENCE-EXEMPT ACCESS TO THE 6 GHZ BAND



- Adopted 5925-7125 MHz
- Adopted 5925-6425 MHz, and considering 6425-7125 MHz
- Adopted 5925-6425 MHz
- Recommended 5925-6425 MHz
- Under consultation

Region 2

1200 MHz

- Canada
- USA
- Honduras
- Costa Rica
- Brazil
- Guatemala
- Peru

Region 1

1200 MHz

- Saudi Arabia

500 MHz (& considering 1200 MHz)

- CEPT Area
- European Union
- Qatar
- United Kingdom

500 MHz

- Morocco
- UAE
- Jordan
- Africa / ATU

Region 3

1200 MHz

- South Korea

500 MHz (& considering 1200 MHz)

- Australia
- Hong Kong
- Japan

500 MHz

- Malaysia



EUROPE

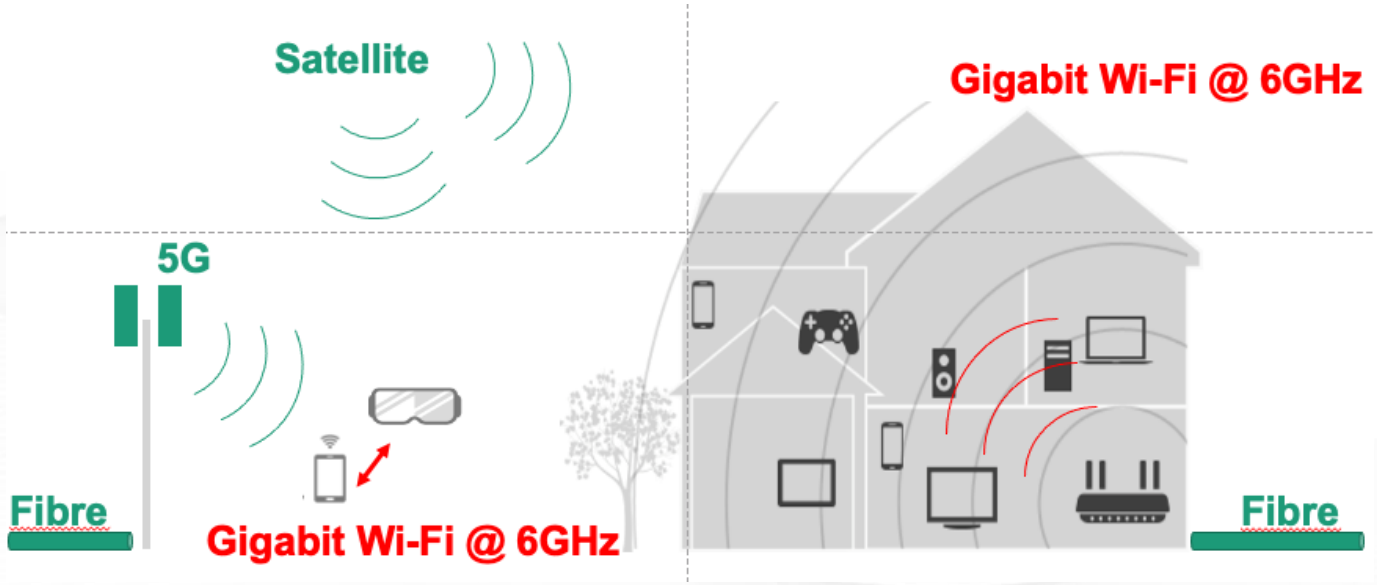
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Wi-Fi 6E/7 key for affordable gigabit connectivity

Wi-Fi is:

- The last mile to the user's devices.
  More users, more devices per user, more wireless devices, more bandwidth per existing application, new high bandwidth applications
- The primary technology for indoor connectivity
  Indoor connectivity carries the vast majority of internet traffic (90% of data usage is indoors (*BEREC) and 90% of time is spent indoors)
- A cost-effective and easy to deploy technology (contributing to digital transition and reducing rural divide)



The European 2030 Gigabit Society

The 2030 Programme "Path to the Digital Decade"

Connectivity target: "*All European households will be covered by a Gigabit network, with all populated areas covered by 5G*"
Gigabit coverage target: "*All European households will be covered by a Gigabit network*"

- Currently in Europe, there is a policy gap for indoor connectivity: The 2030 Programme shouldn't ignore what happens after the fibre reaches the household. Policies supporting/enabling Wi-Fi are needed.
- 5G / Wi-Fi are complementary technologies, choice depends on the use case (ex. AR/VR).
- An approach to connectivity that is technology neutral and promotes several advanced gigabit technologies.

RSPG Programme

Draft RSPG Work Programme primarily focuses on spectrum for national licenced mobile networks. A more balanced approach should be taken that incorporates elements related to licence-exempt and lightly-licenced access options.

- 3800-4200 MHz Band
- 6425-7125 MHz Band

Wi-Fi – Omnipresent and almost always taken for granted

- Households (teleworking, telemedicine, home-schooling, shopping, entertainment, etc)
- Crucial for sectors like healthcare (hospitals), education (schools, universities), transportation
- Offices, Industry (IoT), smart warehouse, smart cities
- Public hotspots – airports, hospitals, hotel, libraries, cafes, etc.

DIGITAL TRANSFORMATION OF SMES



SUPPORTING EUROPE'S FARMERS



INNOVATION AND EUROPEAN START-UPS



RURAL CONNECTIVITY GAP



INTERNET OF THINGS (IOT) – SMART HOMES AND FACTORIES



HELPING EUROPE'S GREEN TRANSITION



AUGMENTED REALITY (AR), VIRTUAL REALITY (VR), EXTENDED REALITY (XR)



Wi-Fi 6E/7 key for affordable gigabit connectivity

- European organizations representing a wide range of sectors from satellite operators to augmented and virtual reality companies, startups, manufacturers, small and medium sized enterprises, and video game companies signed a letter to the members of the European Commission and European Parliament.
  - The group calls on EU policymakers to consider the enabling role of Wi-Fi and satellite technologies as they reflect on priority actions for the EU Digital Decade Policy Programme.
- European citizens and businesses should be given the ability to choose the gigabit technologies best suited to their specific needs.



EUROXR DSA ALLIED FOR STARTUPS ESOA ISFE LANCOM

Brussels, 29 November 2021

ENSURING WI-FI CONNECTIVITY IN AN INNOVATIVE AND TRULY CONNECTED EUROPEAN GIGABIT SOCIETY

Dear Members of the European Parliament,
Dear Ambassadors,
Dear Commissioners,

We, the signatories, representing a wide range of sectors (satellite, SMEs, start-ups, manufacturers, chipset vendors and content application services, video games sector) convinced of the power of Wi-Fi and satellite technology in supporting Europe's digital transition, welcome the publication by the European Commission of its draft EU Digital Decade Policy Programme – which operationalises the 2030 Digital Compass.

Given its enabling function, we strongly support the priority given by the draft Policy Programme to achieving gigabit connectivity for EU citizens and businesses. Representing a diverse variety of users and providers of connectivity, we truly believe in an approach to connectivity that is technology neutral and promotes several advanced gigabit technologies, such as next generations Wi-Fi and satellite in addition to fibre and 5G.

Wi-Fi is omnipresent in our lives and currently provides the most effective means of ensuring wireless connectivity inside our homes and offices, but also at public hotspots such as hotels, cafes and restaurants, airports, libraries, schools, or hospitals. In areas where terrestrial infrastructure is lacking, Wi-Fi is often backhauled by satellite. Wi-Fi is also heavily used by industries to provide connectivity for IoT devices in, for example, smart factories. Satellite is also enabling direct broadband connectivity in multiple EU states and saw a significant increase in new installations during the Pandemic.

The digital transformation of the whole European society (including SMEs, start-ups and other industries) therefore must include Wi-Fi-connectivity and satellite alongside other technology solutions. As the wireless extension of fibre networks, Wi-Fi will also be essential to ensure effective achievements of the gigabit connectivity targets for 2030. Innovation will also rely on Wi-Fi as technologies of the future, such as advanced Augmented Reality (AR) and Virtual Reality (VR), will not be able to work solely on 5G and fibre, but also rely on complementary enhanced Wi-Fi connectivity. For example, AR glasses will connect to a 5G handset via a Wi-Fi link.

In addition, rural connectivity is a persistent challenge in Europe and globally. Experience has demonstrated that no technology on its own can solve the rural connectivity gap. Tackling it will rather require a combination of solutions, involving private and public efforts and a mix of technologies, including 5G, fibre, satellite, fixed wireless technologies and Wi-Fi.

Europe should ensure that enough spectrum is made available to enable the new generations of Wi-Fi gigabit technologies, Wi-Fi 6E and Wi-Fi 7, to thrive in Europe alongside 5G and fibre. We strongly believe European citizens and businesses should be given the ability to choose the gigabit technologies best suited to their specific needs.

1

EUROXR DSA ALLIED FOR STARTUPS ESOA ISFE LANCOM

It is critical that Europe starts working now in making available the required spectrum for the 2030 Gigabit society, which should include ensuring the upper 6 GHz (6425-7125 MHz) band is devoted to Wi-Fi alongside the incumbent services in the band, such as satellite and fixed services. Failure to do so will leave Europe trailing behind other prominent economies, such as the US, Canada, Brazil, and South Korea, which have already released the full 6 GHz (5925-7125 MHz) band for Wi-Fi use. Most importantly, it will mean European citizens, SMEs, start-ups and other industries will not benefit from the same high-quality advanced products and services as their equals in other regions of the world.

We call on the Commission, Council, and European Parliament to:

- Fully reflect in the EU Digital Decade Policy Programme and related policy guidance and implementing decisions, the role played by Wi-Fi and satellite in achieving EU 2030 connectivity targets and in unleashing the full potential of digital and green technologies, alongside 5G and fibre.
- Ensure additional spectrum for new generations of Wi-Fi (Wi-Fi 6E and Wi-Fi 7), by opening the full 6 GHz (5945-7125 MHz) band for licence-exempt use.

A digitally connected Gigabit Europe cannot be achieved without a strong contribution from Wi-Fi, alongside 5G and fibre.

Please see the Annex for more examples of enhanced Wi-Fi applications.

Signatures:

Allied for Startups
Benedikt Blomeyer-Bartenstein,
Director EU Policy

LANCOM Systems
Ralf Koenzen, Managing Director

AVM
Johannes Nill
CEO, Chairman of the Board

EuroXR Association
Marco Sacco, President

Dynamic Spectrum Alliance
Martha Suarez, President

ESOA
Aarti Holla-Maini, Secretary General

ISFE
Simon Little, CEO

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http://dynamicspectrumalliance.org/wp-content/uploads/2021/11/2021-11-29-Open-Letter-to-EU-Institutions.pdf

www.dynamicspectrumalliance.org

Digital Decade Policy Programme – Europe



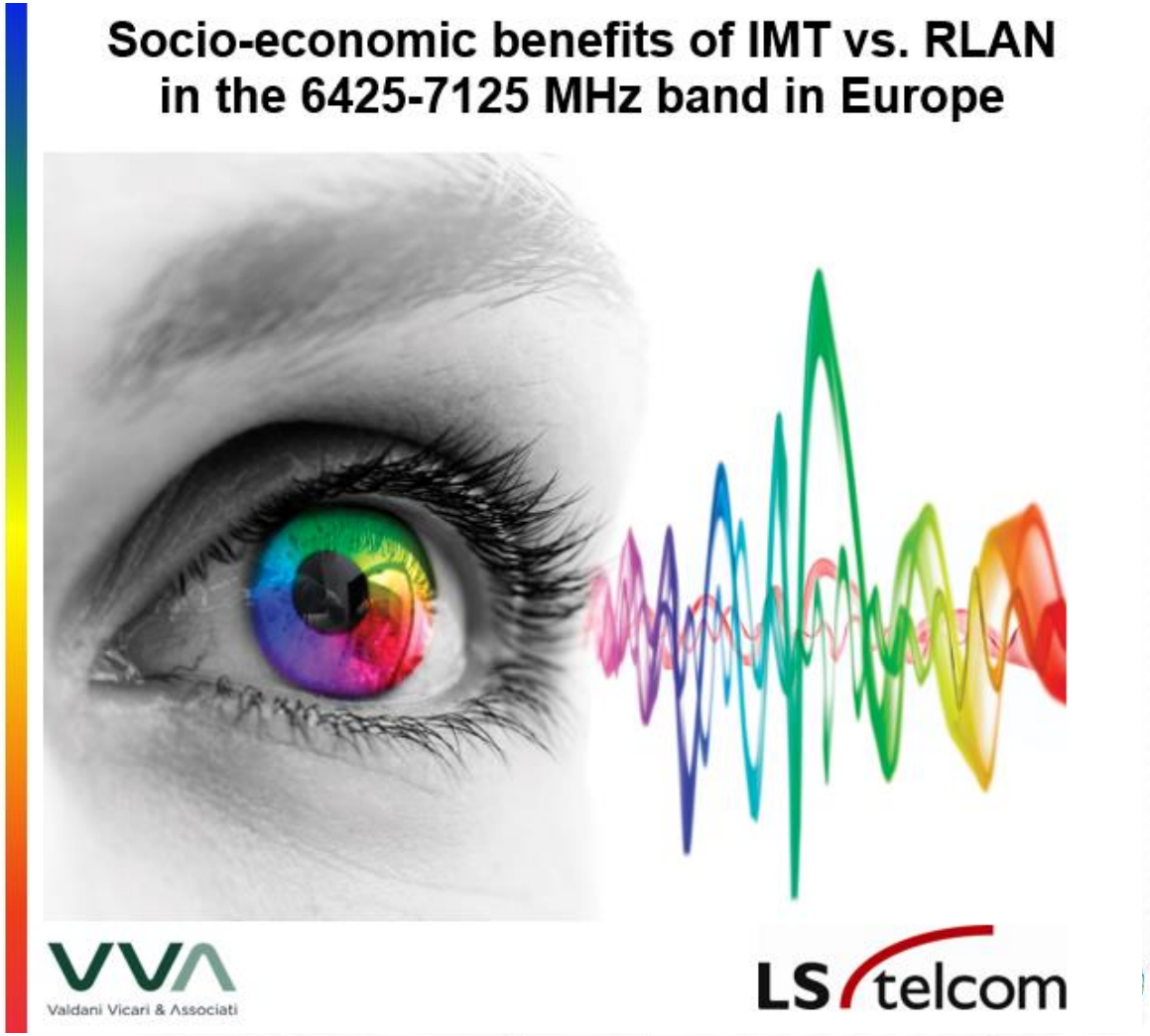


MEP Cutajar stated: "We should promote an approach to connectivity that aims, first and foremost, to ensure the full coverage of all European households and business premises, regardless their location, by next generation networks (…).

We should adopt a complementary approach that focuses on the final objective rather than a specific technology. And Wi-Fi can play an important role in reaching this goal, especially when it comes to indoors connectivity"

New whitepaper and study – Europe





How do Europeans connect to the internet?

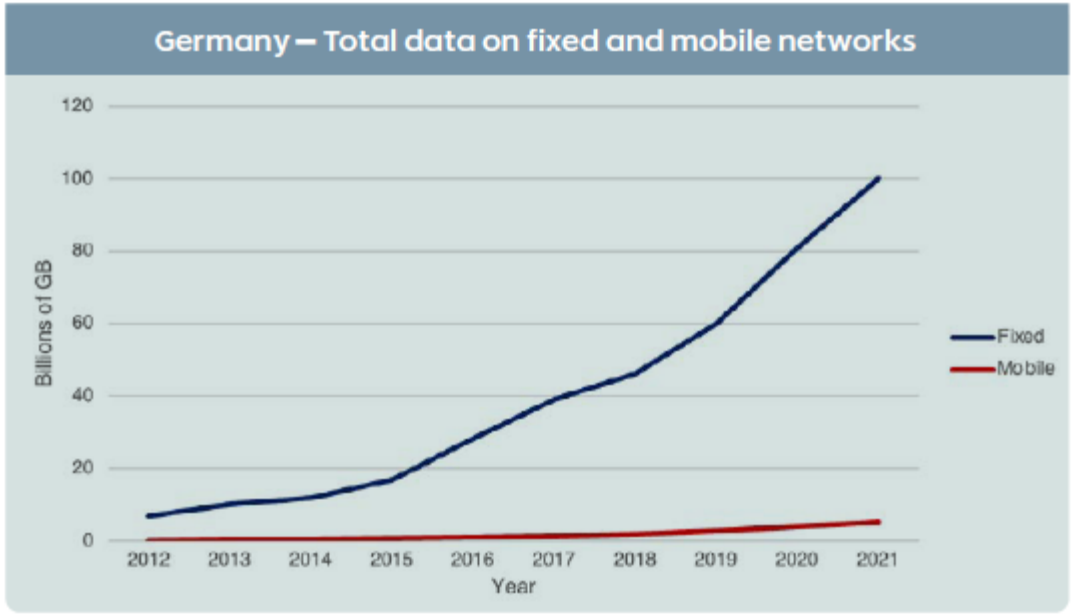


Figure 2: Germany - Total data on fixed and mobile networks. Source: BNetzA.

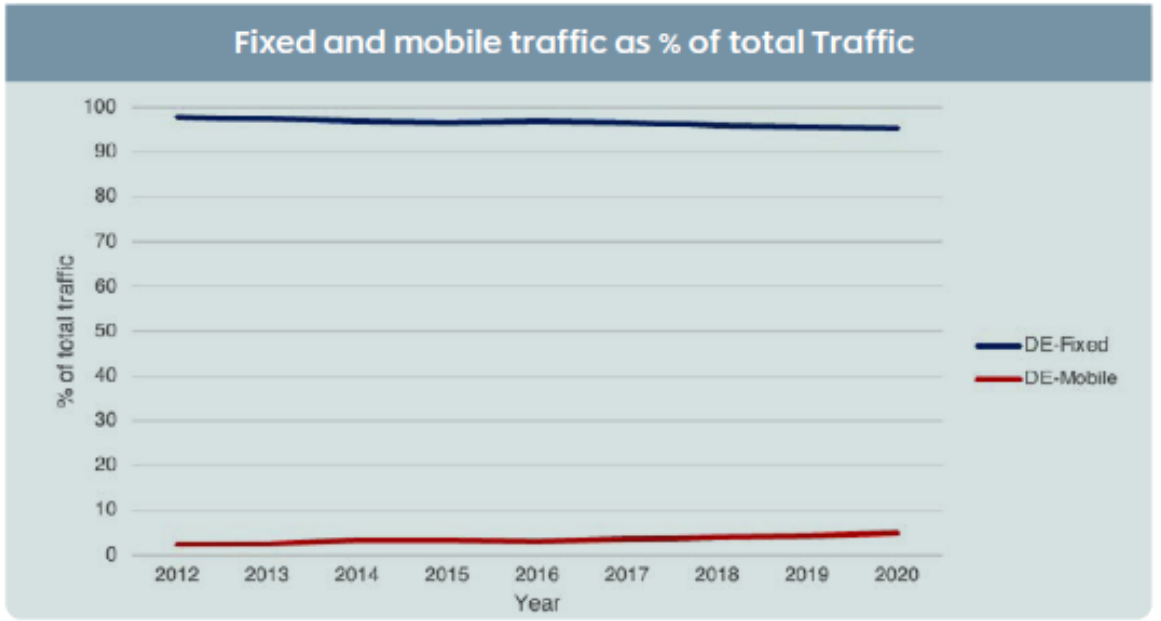
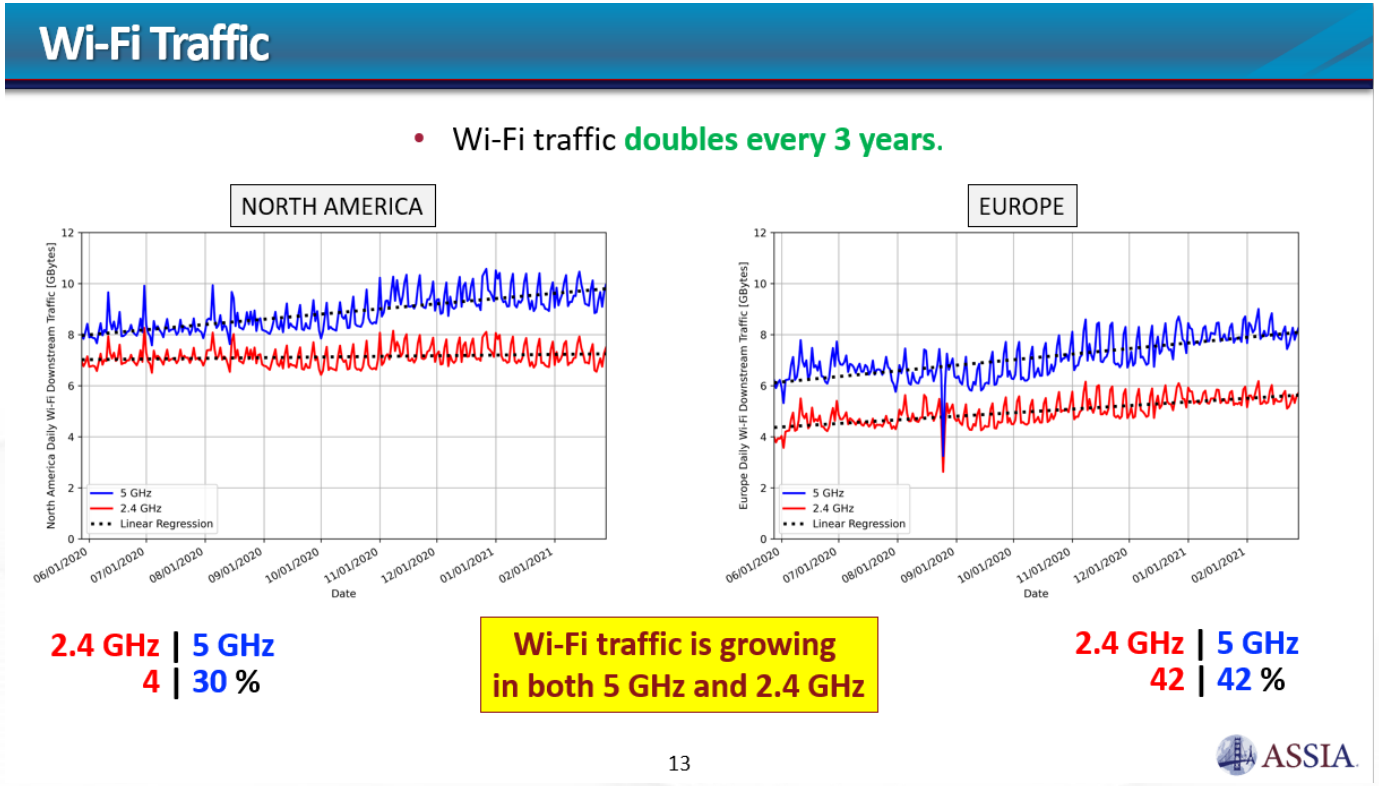


Figure 3: Historical fixed and mobile traffic as % of total traffic. Data source: BNetzA.

The data reported by BNetzA clearly indicates that the vast majority of traffic occurs over the fixed network.

An allocation of 500 MHz in lieu of the full 5925-7125 MHz is not sufficient

- 1200 MHz to attend growing demand for wireless capacity (seven 160 MHz channels).
- Long term vision, planning for Wi-Fi 7 (320 MHz bandwidth channels) and future spectrum requirements.



More information at http://dynamicspectrumalliance.org/resources/

How do Europeans connect to the internet?

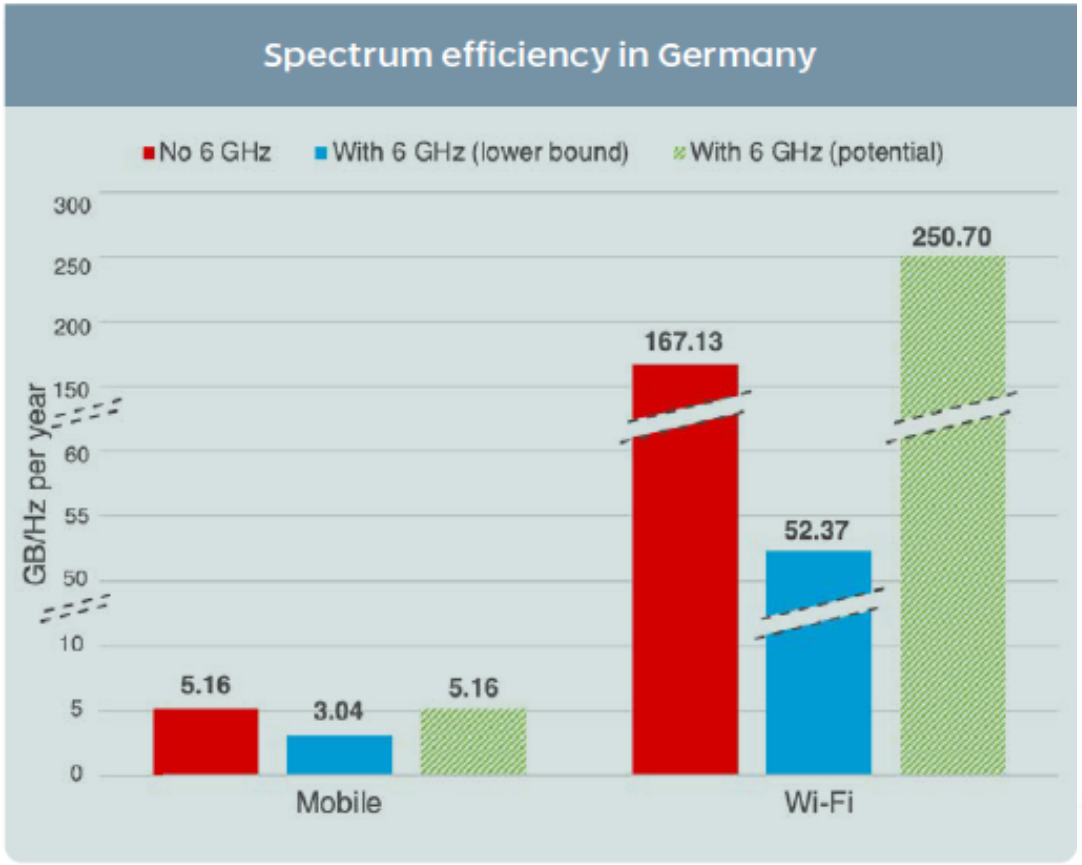


Figure 4: Estimates for overall spectrum efficiency of mobile networks and Wi-Fi in Germany, using traffic data from 2021.

Allowing Wi-Fi in the upper 6 GHz band will improve the quality of service of about 90% of internet access in Europe, amounting to a more efficient use of spectrum than mobile networks.

How do Europeans connect to the internet?

CONCLUSIONS

An analysis of the Wi-Fi and mobile data demonstrates that:

- Wi-Fi handles over 90% of fixed network traffic, i.e. the vast majority of internet traffic in Europe,
- Mobile networks only deliver traffic equivalent to 5% of the fixed network traffic, i.e. is not relevant from a capacity standpoint,
- Wi-Fi is an order of magnitude more spectrum-efficient than mobile networks, and will continue to be, even if the full 6 GHz band is allocated to Wi-Fi.
- Allowing Wi-Fi in the upper 6 GHz band will improve the quality of service of about 90% of internet access in Europe, amounting to a more efficient use of spectrum than mobile networks.

RECOMMENDATIONS

- IMT identification of the 6425-7125 MHz band is not required nor desirable: providing additional 700 MHz for mobile, which only carries 7% of wireless internet traffic, is not an efficient use of spectrum.
- Europe should authorise operation of licence-exempt RLANs, such as Wi-Fi, in the 6425-7125 MHz band so that the region can benefit from the extensive ecosystem already serving the entire 6 GHz band.
- Europe should focus on harnessing mobile connectivity to support mobility and develop strategies – including on spectrum – to increase the coverage of mobile networks in line with the policy goals of the EU Digital Decade.

Socio-economic benefits of IMT vs RLAN in the 6425 - 7125 MHz in Europe

Study divided into two parts a technical analysis and economic analysis.
Explore in each study the technical and economic benefits of the upper 6 GHz band for three scenarios:

Scenario	Description (use of upper 6 GHz)	Comparison with
1	Licensed nationwide IMT (high power)	3.4 – 3.8 GHz
2	Local licensed IMT	400 MHz within C-Band
3	Licence-exempt	Lower 500 MHz vs full 1200 MHz

Socio-economic benefits of IMT vs RLAN in the 6425 - 7125 MHz in Europe

Scenario 3 (RLAN) provides the most suitable results from:

- ✓ An investment cost perspective
- ✓ A downstream market perspective
- ✓ A cost versus QoS deployed

Overview of Fitness vs user needs

	Wide area IMT	IMT Local	RLAN
Agriculture	Medium	Medium	Medium
Construction	Low	Medium	Medium
Healthcare	Low	Low	High
Manufacturing	Low	Low	High
Education	Low	Low	Medium
Public Service	Low	High	High
Average	**Low**	**Medium**	**High**



ASSESING THE ECONOMIC VALUE OF UNLICENSED USE OF THE 6 GHz BAND – AN OVERVIEW

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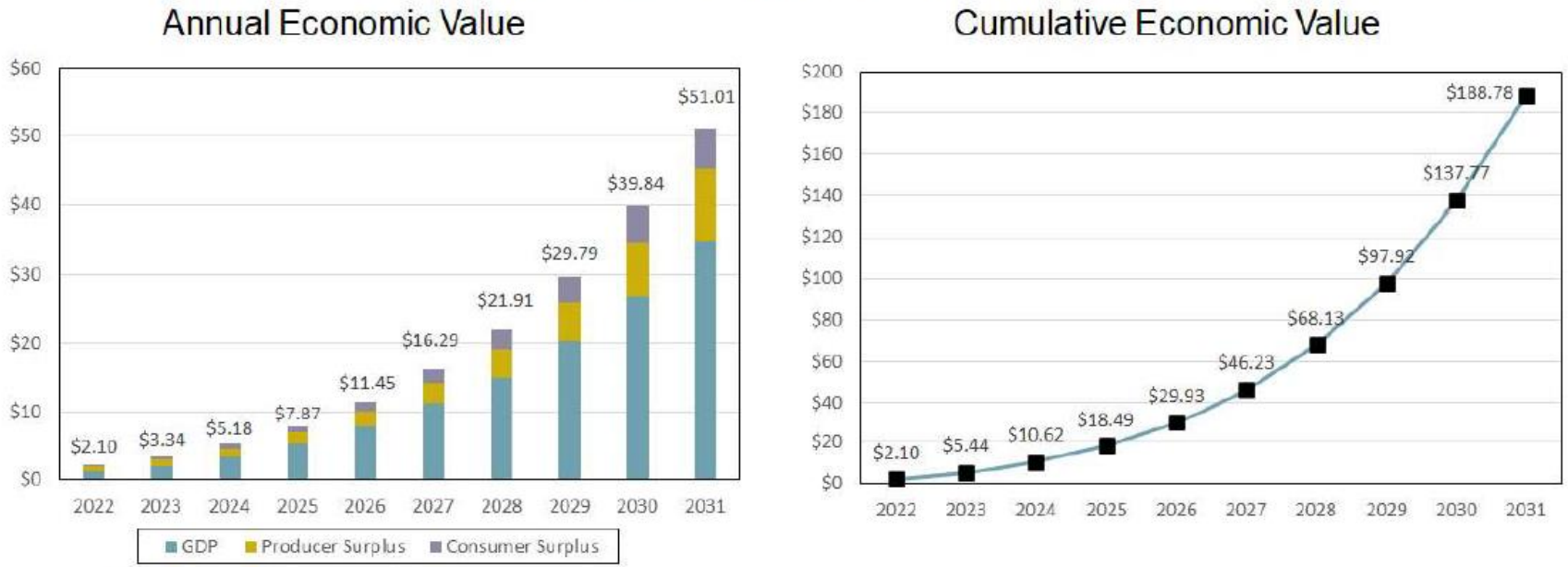
Indonesia: Social and economic benefits flow from designating the full 6 GHz band to unlicensed use

Source of Value	GDP contribution	Producer surplus	Consumer surplus
Enhanced coverage and improved affordability	$ 5.16		$ 0.05
Increased broadband speed by reducing Wi-Fi congestion	$ 29.99		$ 3.62
Wide deployment of Internet of Things	$ 14. 09	$ 21.24	
Reduction of enterprise wireless costs		$ 0.92	
Deployment of AR/VR solutions	$ 36.57	$ 7.24	
Enhanced deployment of municipal Wi-Fi	$ 6.61		$ 0.04
Deployment of Free Wi-Fi Hot Spots	$ 34.03		$ 1.88
Aligning spectrum decision with other advanced economies		$0.38	
Enhancing the capability for cellular off-loading		$ 2.96	
Increasing production of residential Wi-Fi devices and equipment		$ 4.99	$ 17.88
TOTAL	$ 126.44	$ 37.73	$ 23.47

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Indonesia: Social and economic benefits flow from designating the full 6 GHz band to unlicensed use

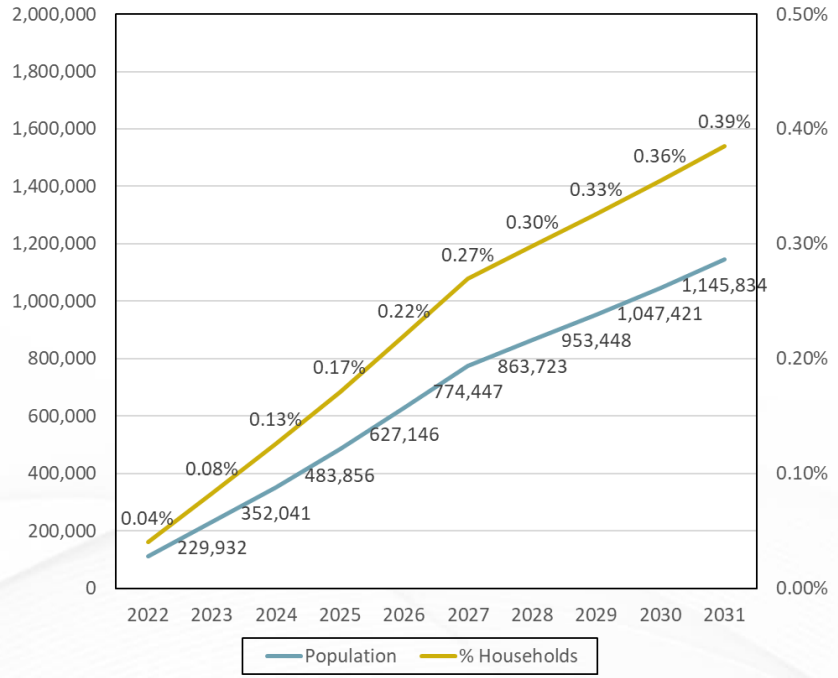
Indonesia: Economic value of allocating 1200 MHz in the 6 GHz band (2022-2031) (in US$ billions)



Source: Telecom Advisory Services analysis

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Indonesia: Contribution of Allocating 1200 MHz of the 6 GHz Band to closing the digital divide (2022-2031)

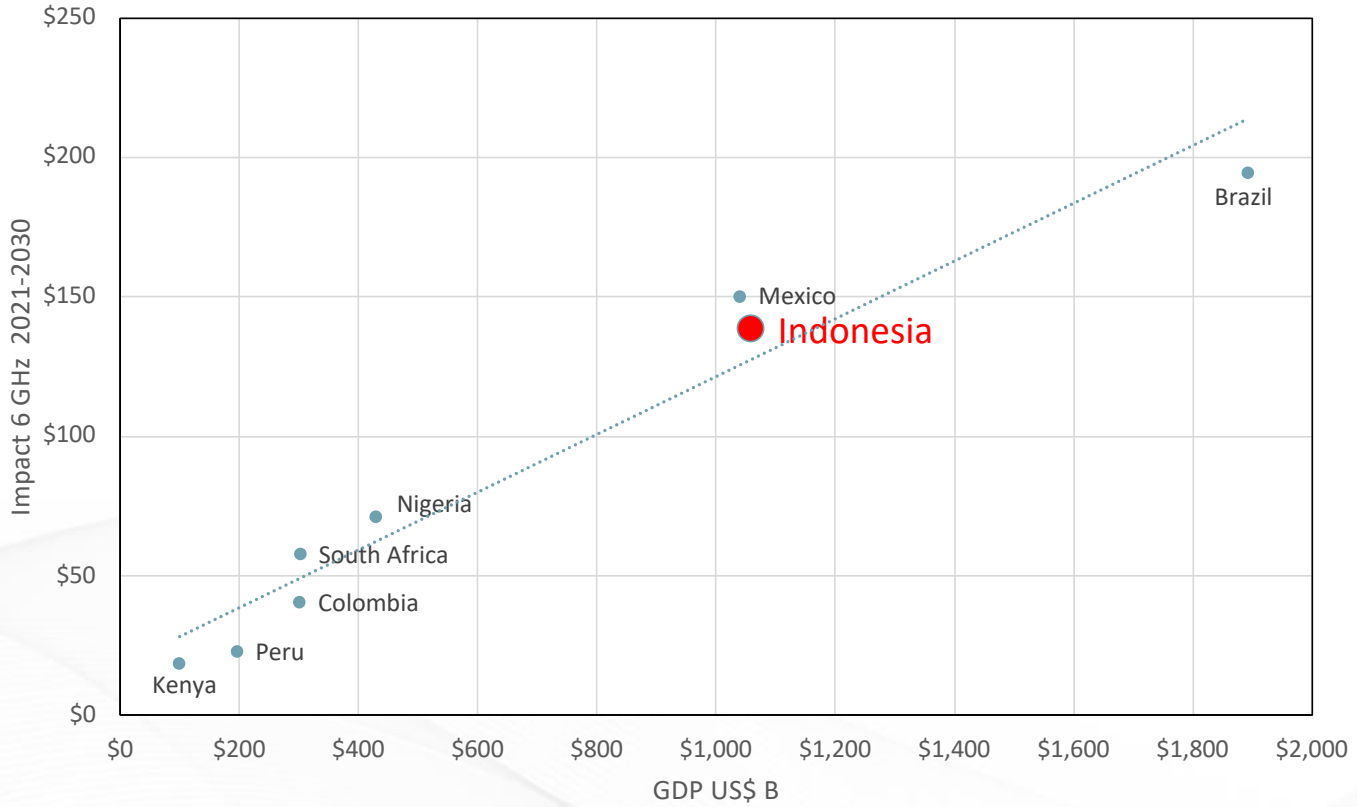


Source: Telecom Advisory Services analysis

The allocation of the entire band to unlicensed use will result in a significant contribution to a reduction of Indonesia´s digital divide. By providing affordable paid service and free access over hot spots because of allocating the full 6 GHz band to Wi-Fi, an incremental 1,145,834 Indonesians will be able to gain access to the Internet by 2031.

http://dynamicspectrumalliance.org/wp-content/uploads/2022/02/Assessing-the-economic-value-of-unlicensed-use-of-the-6GHz-band-in-Indonesia.pdf

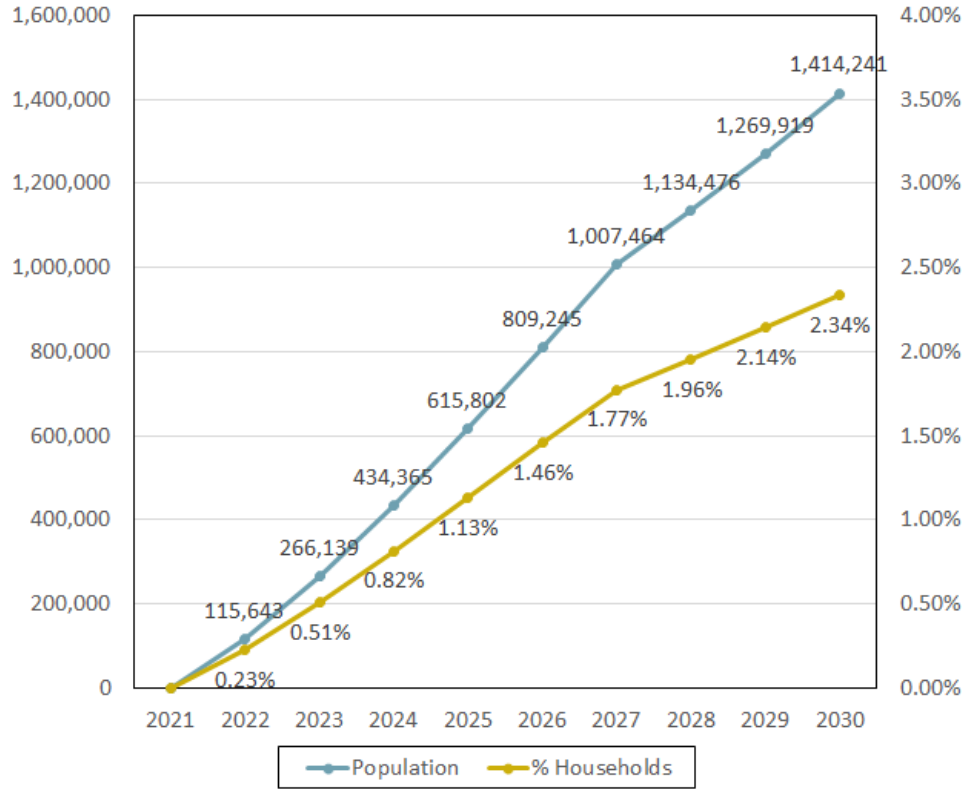
Cumulative Economic impact of 1200 MHz/GDP



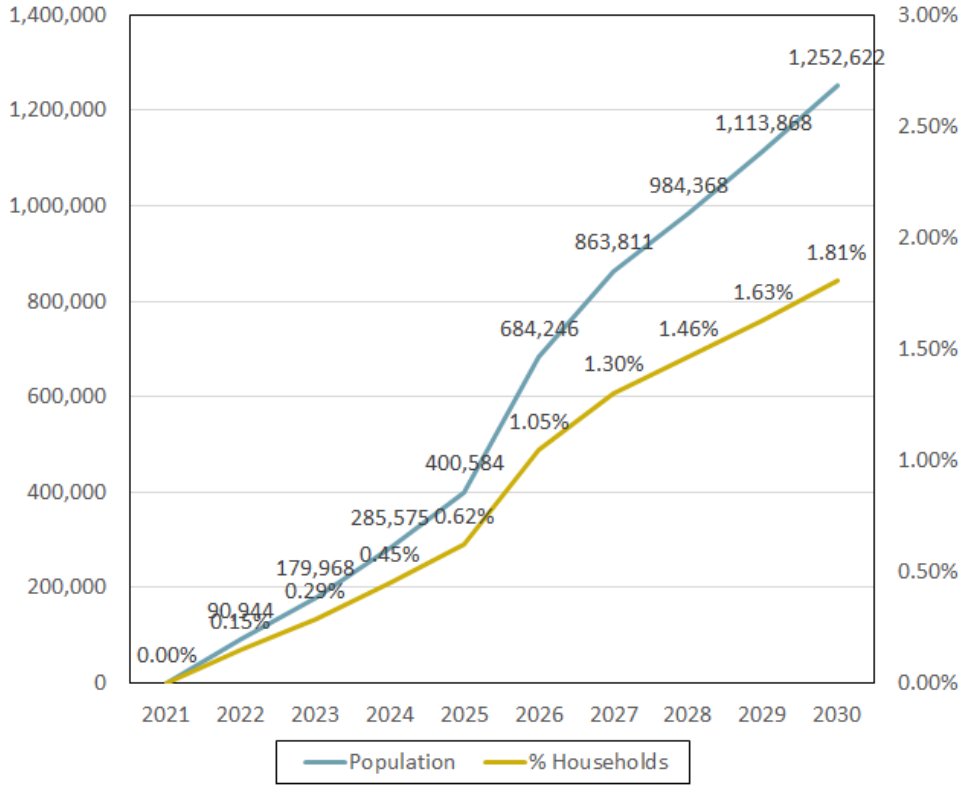
Source: Telecom Advisory Services analysis

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Contribution of Allocating 1200 MHz of the 6 GHz Band to closing the digital divide (2022-2031)



Kenya - Source: Telecom Advisory Services analysis



South Africa - Source: Telecom Advisory Services analysis

CONCLUSION

A. The Gigabit Imperative: current and future use cases driving demand, density and high bandwidth1200 MHz to attend growing demand for wireless capacity and new use cases. Meeting increased demand for Internet access considering the COVID-19 situation.
B. Wi-Fi technology, standards, and interoperability are all in place today, ready for regulatory action
C. With the right regulatory framework, FS and FSS incumbents can continue and grow their primary licensed uses.
D. Permitting license-exempt technologies throughout the full 6 GHz band is the best way to support both future growth and innovation in 5G through 5G offloading, backhaul, and NR-U.
E. An allocation of 500 MHz in lieu of the full 5925-7125 MHz is not sufficient.
F. Relevant Social and economic benefits flow from designating the full 6 GHz band to license-exempt use.
G. Large Opportunity Cost of Inaction



THANK YOU FOR YOUR ATTENTION!

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