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Enabling mmWave spectrum for new uses
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Re: Consultation on Enabling mmWave spectrum for new uses: Making the 26 and 40 GHz bands available for mobile technology

Viasat provides the following comments to Ofcom on the Consultation on enabling mmWave Spectrum for new uses: making the 26 and 40 GHz bands available for mobile technology (Consultation)[1]. Viasat submits these comments to support Ofcom's decision to follow the European and global trends and adopt the 24.25-27.5 GHz (26 GHz) band as the mmWave band for 5G technologies and the 27.5-29.5 GHz (28 GHz) band as a core satellite services band that is expected to continue to grow in the future. Viasat also provides comments on conditions that Ofcom should impose on terrestrial/IMT 5G operations in the 26 GHz band to protect satellite operations in the 28 GHz band from out-of-band-emissions from terrestrial IMT/5G services.

Viasat is a global leading provider of communications solutions across a wide variety of technologies, both satellite and terrestrial. Viasat's use of the Ka band, specifically the paired frequency bands 27.5-30 GHz (Earth-to-space) and 17.7-20.2 GHz (space-to-Earth), is robust as Viasat uses this spectrum today to provide hundreds of millions of high-speed broadband connections every year to households, businesses and passengers in North America, Central America, Latin America[2], Australia[3], and across Europe[4].

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[1] Enabling mmWave spectrum for new uses: Making the 26 and 40 GHz bands available for mobile technology (9 May 2022), https://www.ofcom.org.uk/__data/assets/pdf_file/0027/237258/mmwave-spectrum-condoc.pdf.

[2] See https://viasat.com.mx/community-wi-fi/?lang=en; *Viasat Brings Fastest Home Satellite Internet Service to Mexico*, https://www.viasat.com/news/viasat-brings-fastest-home-satellite-internet-service-mexico; *Viasat Completes Brazilian Residential Internet Service Roll-Out--Now Covers 100% of the Country; Offers New Premium Satellite Internet Service Plan with Highest Speed and Data*, https://www.prnewswire.com/news-releases/viasat-completes-brazilian-residential-internet-service-roll-outnow-covers-100-of-the-country-offers-new-premium-satellite-internet-service-plan-with-highest-speed-and-data-301161443.html.

[3] See *Viasat Wins $286M Satellite Broadband Deal with Australia*, https://spacenews.com/viasat-wins-286m-satellite-broadband-deal-australia/.

[4] See *Viasat's Expansion in Europe Helps Bridge the Gap to Faster Broadband (video),* https://corpblog.viasat.com/viasats-expansion-in-europe-helps-bridge-the-gap-to-faster-broadband/; *Viasat*

As Ofcom has affirmed in the Consultation, the 28 GHz portion of the Ka band, which is adjacent to the 26 GHz band, is a "core band for satellite services" connecting the world that will continue to grow in the UK[5]. The satellites using the 28 GHz band bridge the digital divide today and will continue to do so in the future. These satellites also provide ubiquitous connectivity using the same 28 GHz spectrum for users on the move that no other technology can offer. Viasat has pioneered mobile broadband services using innovative antenna designs for earth stations in motion (ESIM) to aircraft, ships and other land-based vehicles and users.

As Ofcom has proposed in the Consultation, Viasat supports identifying the 26 GHz band for terrestrial IMT/5G to provide broadband wireless electronic communications services. Notably, the CEPT 5G Roadmap expressly provides that the 28 GHz band is to be preserved across CEPT administrations for satellite broadband services. The CEPT 5G Roadmap (Version 10, Revised 6 March 2020) explains that "Europe has harmonized the 27.5-29.5 GHz band for broadband satellite and is supportive of the worldwide use of this band for ESIM. This band is therefore not available for 5G"[6]. Therefore, Viasat urges Ofcom to implement the CEPT decisions for the 28 and 26 GHz bands for satellite-powered broadband and terrestrial IMT/5G services, respectively.

Affirms Commitments to Bring its Powerful ViaSat-3 Satellite to Europe, https://www.viasat.com/news/viasat-affirms-commitments-bring-its-powerful-viasat-3-satellite-europe; *KLM Introduces Viasat In-Flight Wi-Fi on European Flights,* https://www.viasat.com/about/newsroom/press-releases/klm-introduces-viasat-flight-wi-fi-european-flights/ (22 April 2021); *Viasat Completes Acquisition of Remaining Stake in its European Broadband Joint Venture, inclusive of the Ka-Sat Satellite and Ground Assets* (30 April 2021), https://www.viasat.com/about/newsroom/press-releases/viasat-completes-acquisition-remaining-stake-its-european/; *Viasat Ramps Satellite in the Middle East and Western Europe Ahead of ViaSat-3 Launch; Signs Ka-Band capacity Lease Deal with Avanti Communications* (3 June 2021), https://investors.viasat.com/news-releases/news-release-details/viasat-ramps-satellite-services-middle-east-and-western-europe; *Viasat Partners with the Kosice Region of Slovakia; Donates Satellite-Based High-Speed Internet to Ukrainian Refugees* (14 April 2022), https://investors.viasat.com/news-releases/news-release-details/viasat-partners-kosice-region-slovakia-donates-satellite-based; *Viasat Joins Harwell Space Cluster to Support UK Innovation* (19 Apr. 2022), https://investors.viasat.com/news-releases/news-release-details/viasat-joins-harwell-space-cluster-support-uk-innovation; *Avanti Communications and Viasat Energy sign long term Ka-band capacity lease agreement targeting the energy sector* (23 June 2022), https://investors.viasat.com/news-releases/news-release-details/avanti-communications-and-viasat-energy-services-sign-long-term; *Virgin Atlantic Selects Viasat for In-flight Connectivity on its New Airbus A330-900 Fleet* (12 July 2022), https://investors.viasat.com/news-releases/news-release-details/virgin-atlantic-selects-viasat-flight-connectivity-its-new.

[5] Consultation, Sections 2.21, 2.22.

[6] *See* European Conference of Postal and Telecommunications Administrations (CEPT), *Spectrum for wireless broadband – 5G*, Section B.3 (Version 10, Revised 6 March 2020), https://www.cept.org/Documents/ecc/57839/ecc-20-055-annex-15_cept_5g_roadmap.

The ITU WRC-19 designated over 17 gigahertz of spectrum for terrestrial IMT/5G in the mmWave bands, including the 26 GHz band[7]. Given the vast amount of spectrum available for terrestrial IMT/5G in the mmWave bands, including the 26 GHz and other bands, Viasat urges Ofcom to preserve the 28 GHz band for satellite-powered broadband services. When considering the amount of spectrum to assign for terrestrial IMT/5G, Viasat urges Ofcom to carefully consider the required terrestrial IMT/5G block sizes[8] for grants and local licensing in the 26 GHz band and only assign the amount of spectrum necessary to meet demonstrated market demand.

Viasat would like to highlight that the use of the 26 GHz band by both Fixed Service Point-to-Point (FS P-P) and terrestrial IMT/5G is possible on a coordinated basis as described in ECC Report 303[9]. Viasat's view is that current operators of FS P-P systems, if any, are unlikely to invest in migration from 26 GHz without significant market demand to justify the investment in equipment upgrades. There is ample spectrum within the 3.25 GHz comprising the 26 GHz frequency band for both existing FS P-P and new terrestrial IMT/5G. Viasat urges Ofcom to accommodate deployment of existing FS P-P and new terrestrial IMT/5G without migrating FS P-P links to other bands, including the 28 GHz band.

As stated above, Viasat, as with many satellite operators, provides broadband services in the adjacent 28 GHz frequency band throughout Europe, including in the UK, and the rest of the world. As such, Viasat is concerned about potential out-of-band emissions from the 26 GHz band by terrestrial IMT/5G systems into the 28 GHz band. Increases in power by terrestrial IMT/5G systems in the 26 GHz band could increase terrestrial IMT/5G out-of-band emissions into the 28 GHz band. Increased out-of-band emissions in the 26 GHz band could adversely affect the interference environment in the 28 GHz band by interfering with the ability of satellite receivers on spacecraft in space to receive signals from earth stations in their networks. Therefore, Viasat respectfully requests that Ofcom limit out-of-band emissions from terrestrial IMT/5G operations in the 26 GHz band to protect satellite-powered broadband service in the adjacent 28 GHz band. Viasat also requests that Ofcom ensure that the *aggregate level* of terrestrial IMT/5G out-of-band emissions from the 26 GHz band into the adjacent 28 GHz band does not cause interference to satellite receivers in the 28 GHz band.

In addition to the out-of-band emissions that may be generated by terrestrial IMT/5G deployment on the ground, Viasat is also concerned about deployment of unmanned aircraft in

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7 *See* ITU Press Release, *WRC-19 identifies additional frequency bands for 5G*, (22 Nov. 2020) (those bands include the following: 24,25-27,5 GHz, 37-43,5 GHz, 45,5-47 GHz, 47,2-48,2 and 66-71 GHz), https://news.itu.int/wrc-19-agrees-to-identify-new-frequency-bands-for-5g/.

8 IMT/5G specifications in ITU-R M.2150 require a minimum average spectral efficiency of 7.8 bps/Hz in dense urban areas for a cell capacity of 3 Gbps per cell in a 400 MHz channel.

9 *See* ECC Report 303 (5 July 2019) on "Guidance to administrations for Coexistence between 5G and Fixed Links in the 26 GHz band ("Toolbox")".

the 26 GHz band because the terrestrial IMT/5G base station antennas pointed upwards to communicate with the unmanned aircraft could transmit signals towards satellite receivers in space and increase out-of-band emissions in the adjacent 28 GHz band. Viasat urges Ofcom to ensure that Resolution 242 (WRC-19) 26 GHz band out-of-band limits and pointing requirements are applied to terrestrial IMT/5G operations in order to protect 28 GHz satellite receivers in space.

Viasat has supported the study and development of reasonable operating parameters for terrestrial IMT/5G in the 26 GHz band throughout the ITU WRC-19 process. Viasat urges Ofcom to conform domestic implementation of terrestrial IMT/5G to the operating parameters decided in Resolution 242 (WRC-19). Among several items, Viasat emphasizes the importance of the portion of Resolution 242 (WRC-19) that requires that terrestrial IMT/5G base stations within the 26 GHz frequency band with high power operations (e.i.r.p. per beam exceeding 30 dBW/200 MHz) not point their antenna beams upward and maintain a minimum separation angle of ≥ 7.5 degrees from the geostationary orbit. Viasat urges Ofcom to adopt these technical limitations on terrestrial IMT/5G base stations as outlined in Resolution 242 (WRC-19) to protect critical satellite broadband services operating in the 28 GHz band.

In conclusion, Viasat urges Ofcom to follow the global trends and ensure end users in the UK receive the benefits of satellite-powered broadband services in the 28 GHz band and terrestrial IMT/5G services in the 26 GHz band (as well as the numerous other bands that are available). These actions are consistent with the CEPT 5G Roadmap, preserve the 28 GHz band for satellite-powered broadband services, and allow the ITU's WRC-19 terrestrial IMT/5G decision to pave the way for terrestrial IMT/5G across the 26 GHz band.