



9 August 2021

**Broadcasting and Telecom Regulator (RTR)**

Mariahilfer Straße 77-79,  
A-1060 Wien

Submitted to: [tkfreq@rtr.at](mailto:tkfreq@rtr.at)

**Re: Consultation on future frequency allocations for harmonized ECS- Frequencies for mobile communication and broadband**

Viasat provides the following comments to the Austrian Broadcasting and Telecom Regulator (RTR) on the Consultation on future frequencies allocation for harmonized ECS-frequencies for mobile communications and broadband (Consultation). Viasat provides answers to questions raised in the Consultation and comments on the 24.25-27.5 GHz (26 GHz band) proposals. Viasat submits these comments on the 26 GHz band proposals and the adjacent 28 GHz band, which is heavily used by satellite broadband services, to ensure that RTR has a full record on the use of these bands as satellite broadband services continue to deploy, particularly in the 28 GHz band.

In these comments Viasat: (1) provides information on the satellite-powered broadband services that Viasat and other satellite operators provide in Europe and around the world in the paired 17.7-20.2 GHz downlink and 27.5-30 GHz uplink bands, that include the critical 27.5-29.5 GHz (28 GHz) band; (2) supports the identification of the 26 GHz band for terrestrial IMT/5G and the preservation of the 28 GHz band for satellite-powered broadband services; (3) proposes aligning the amount of spectrum being identified for terrestrial IMT/5G in the 26 GHz band with the actual and demonstrated market demand for terrestrial IMT/5G; (4) recommends conditions that need to be placed on terrestrial IMT/5G services in the 26 GHz band to protect satellite-powered services in the adjacent 28 GHz band; and (5) recommends implementation of relevant European harmonized regulations for the use of Earth Stations in Motion (ESIM)/Earth Stations on Mobile Platforms (ESOMPs) in the 17.3-20.2 GHz and 27.5-30 GHz bands.

Viasat is a global leading provider of communications solutions across a wide variety of technologies, both satellite and terrestrial. As the world's only vertically integrated end-to-end satellite operator, Viasat designs and builds every component of our networks—user terminals, satellite payloads and ground stations—to meet the market demand for reliable, effective and affordable, high-speed broadband connectivity. 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,<sup>1</sup> Australia,<sup>2</sup> and across Europe<sup>3</sup>.

The 28 GHz portion of the Ka band, which is adjacent to the 26 GHz band, is a critical element of the satellite-powered connected world. 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 band spectrum for users on the move that no other technology can offer. Viasat has pioneered mobile broadband services using innovative antenna designs for ESIM to aircraft, ships and other land-based vehicles and users.

Viasat supports identifying the 26 GHz band for terrestrial IMT/5G to provide broadband wireless electronic communications services pursuant to European

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<sup>1</sup> 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>.

<sup>2</sup> See *Viasat Wins \$286M Satellite Broadband Deal with Australia*, <https://spacenews.com/viasat-wins-286m-satellite-broadband-deal-australia/>.

<sup>3</sup> 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 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/> (April 22, 2021); *Viasat Completes Acquisition of Remaining Stake in its European Broadband Joint Venture, inclusive of the Ka-Sat Satellite and Ground Assets* (April 30, 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* (June 3, 2021), <https://investors.viasat.com/news-releases/news-release-details/viasat-ramps-satellite-services-middle-east-and-western-europe>.

Commission Decisions (EU) 2019/784<sup>4</sup> and (EU) 2020/590<sup>5</sup>. 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”<sup>6</sup>. Therefore, Viasat urges Austria to implement the CEPT decisions for the 28 and 26 GHz bands for satellite-powered broadband and terrestrial IMT/5G services, respectively.

When it comes to market development (Question 1.1. of the Consultation), Viasat would like to stress that in addition to fixed services broadband applications (e-learning, teleworking, telemedicine), satellite-powered broadband meets the demand of mobile broadband services—on airplanes, trains, buses, cars, trucks, helicopters, ambulances, and ships alike. For example, Viasat provides over 150 million connections annually to personal electronic devices on almost 1,500 commercial aircraft. In many cases, there are more personal electronic devices connected than passengers on a plane.

Underpinning this market development is consistent spectrum availability that has facilitated considerable investment in new technologies that have reduced the “cost per bit” of delivering satellite broadband service. Providing consistent spectrum allocations for satellite connectivity has made it possible to provide reliable high-speed broadband service comparable to what consumers have come to expect from terrestrial broadband services, and at competitive prices. Today satellite broadband is capable of delivering broadband speeds of 100 Mbit/s and beyond.

Spectrum is essential for satellite services, just the same way that it is for other wireless services. Just like terrestrial networks, satellite networks scale over time to serve a growing customer base through investments that conceptually are no different than those needed to scale terrestrial networks. In most of the world, the entire 17.7-20.2 GHz and

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<sup>4</sup> See Commission Implementing Decision (EU) 2019/784 of 14 May 2019 *on harmonisation of the 24,25-27,5 GHz frequency band for terrestrial systems capable of providing wireless broadband electronic communications services in the Union* (notified under document C(2019) 3450), <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32019D0784>.

<sup>5</sup> See Commission Implementing Decision (EU) 2020/590 of 24 April 2020 *amending Decision (EU) 2019/784 as regards an update of relevant technical conditions applicable to the 24,25-27,5 GHz frequency band* (notified under document C(2020) 2542), <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32019D0784>.

<sup>6</sup> 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](https://www.cept.org/Documents/ecc/57839/ecc-20-055-annex-15_cept_5g_roadmap).

27.5-30 GHz bands are available for satellite broadband services. To benefit from the advancements of satellite-powered broadband, Viasat urges Austria to follow the global trend by implementing the use of satellite applications in the full 27.5-30 GHz frequency band.

Viasat would now like to address the topics raised in the Consultation related to the 26 GHz band the adjacent band to the 28 GHz band used by satellite as Austria considers the implementation of its Spectrum Release Plan.

**#1 Market use cases for the 26 GHz band are in early development thus requirements for terrestrial IMT/5G services can be fully accommodated in the 26 GHz band and other bands identified for terrestrial IMT/5G.**

There is little usage of the 26 GHz band in Europe and internationally due to limited demand for terrestrial use of mmWave at this point given the business case uncertainty. Thus, Viasat recommends that Austria adopt an approach that accommodates any future demand for terrestrial IMT/5G services in the 26 GHz band and other bands identified for terrestrial IMT/5G, while also appropriately protecting existing services, including the fixed service operating in 26 GHz band and satellite-powered broadband services, operating in the adjacent 28 GHz band.

The ITU WRC-19 designated over 17 gigahertz of spectrum for terrestrial IMT/5G in the mmWave bands, including the 26 GHz band<sup>7</sup>. Viasat urges Austria to take the vast amount of spectrum available for terrestrial IMT/5G in the mmWave bands, identified by WRC-19, and the additional low-band and mid-band spectrum being made available in countries around the world for terrestrial IMT/5G, into account as part of its overall review of spectrum for terrestrial IMT/5G services given the vast amount of spectrum available for terrestrial IMT/5G in the mmWave bands, including the 26 GHz and other bands.

**#2 There is sufficient spectrum in the 26 GHz band to accommodate future terrestrial IMT/5G services.**

Viasat highlights that the use of the 26 GHz band by both FS Point-to-Point (P-P) and terrestrial IMT/5G is possible on a coordinated basis, as described in ECC Report 303<sup>8</sup>. Furthermore, industry consensus is that terrestrial IMT/5G in millimeter bands will be

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<sup>7</sup> 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/>.

<sup>8</sup> See ECC Report 303, *Guidance to administrations for Coexistence between 5G and Fixed Links in the 26 GHz band ("Toolbox")*, (5 July 2019).

used on a very localized and geographically limited basis due to the short signal propagation radius. A UK OFCOM paper titled “5G Spectrum Access in 26 GHz”, states that terrestrial IMT/5G cell radius will only be “50 meters to a few hundred meters”<sup>9</sup>. The very short cell radius limits the ability to cost-effectively and technically deploy terrestrial IMT/5G in the 26 GHz band. The short range and limited deployment of terrestrial IMT/5G in the 26 GHz band also limits the potential occurrences of interference with FS P-P links in the 26 GHz band making it a suitable band for both services to co-exist.

Given the low potential for interference, the current operators of FS P-P systems are unlikely to invest in migration from the 26 GHz band without significant market demand to justify the investment in equipment upgrades. There is ample spectrum within the 3.25 gigahertz of the 26 GHz frequency band for both existing FS P-P and terrestrial IMT/5G. If market demand is more than the CEPT suggested one gigahertz of 26 GHz spectrum, all possible measures should be taken to ensure that new terrestrial IMT/5G systems can use the 26 GHz spectrum on a coordinated basis with existing FS P-P services and also consider assigning other bands identified by WRC-19 for terrestrial IMT/5G. Based on demand for terrestrial IMT/5G, the 26 GHz band is more than adequate to accommodate deployment of new terrestrial IMT/5G. In any case, Viasat urges RTR to avoid migrating FS P-P links to the 28 GHz band. Viasat also urges Austria to follow Europe and preserve the 28 GHz frequency band for satellite use.

**#3 Any spectrum award procedure for terrestrial IMT/5G in the 26 GHz band should only be considered based on demonstrated demand.**

Viasat supports the initiation of the process for considering the assignment of spectrum for terrestrial IMT/5G, including the 26 GHz band. When considering the amount of spectrum to assign for terrestrial IMT/5G, Viasat urges RTR to take into account that mobile operators can accommodate 400-megahertz channel block sizes in the 26 GHz band. Block sizes of 800-megahertz are based on the implementation of multiple 400-megahertz carriers per licensee, exceeding the minimum specifications set by international standards<sup>10</sup>. Viasat urges RTR to carefully consider the required IMT/5G block sizes for grants and local licensing in the 26 GHz band and only assign the amount of spectrum necessary to meet demonstrated market demand.

**#4 Power limits on the 26 GHz band should be set to prevent out-of-band emissions.**

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<sup>9</sup> See Ofcom Call for Input, *5G spectrum access at 26 GHz and update on bands above 30 GHz* (July 2017), [https://www.ofcom.gov.uk/data/assets/pdf\\_file/0014/104702/5G-spectrum-access-at-26-GHz.pdf](https://www.ofcom.gov.uk/data/assets/pdf_file/0014/104702/5G-spectrum-access-at-26-GHz.pdf).

<sup>10</sup> 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.

As stated above, Viasat, as with many satellite operators, provides broadband services in the adjacent 28 GHz frequency band throughout Europe 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 RTR 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 RTR 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 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 Austria 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 RTR 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  $\geq 7.5$  degrees from the geostationary orbit. Viasat urges RTR 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.

**#5 Implementation of the amended ECC/DEC/(13)01 to maximize the use of ESIMs for satellite broadband services on the move in the 28 GHz frequency band.**

Viasat highlights that satellite-powered broadband is rapidly transforming technology to provide high-speed, affordable and robust broadband connectivity

supporting the applications and services today's users want, whether at home, work or on the move. To meet this demand, WG FM<sup>11</sup> of the Conference of European Post and Telecommunications (CEPT) has endorsed amended ECC/DEC/(13)01<sup>12</sup> to further enhance aeronautical and maritime ESIM operations in the 27.5-29.5 GHz portion of the Ka band. The revised ECC/DEC/(13)01 was published in July 2021 after final approval of the Electronic Communications Committee (ECC)<sup>13</sup>. Viasat encourages Austria to implement amended ECC/DEC/(13)01 in the relevant national regulations and allow the license exempt use of ESIM in the frequency ranges 17.3-20.2 GHz and 27.5-30 GHz.

In conclusion, Viasat urges RTR to follow the global trends and ensure end users in Austria 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.

Viasat summarizes the following points and urges Austria to:

1. Implement terrestrial IMT/5G in the 26 GHz band and protect the 28 GHz band for satellite-powered services consistent with the CEPT 5G Roadmap and implement the use of satellite applications in the full 27.5-30 GHz frequency band.
2. Align the amount of offered spectrum in the 26 GHz band with international standards and actual and demonstrated market demand for terrestrial IMT/5G services.
3. Recognize the robust use of the 28 GHz band for satellite broadband services and not relocate terrestrial FS links operating in the 26 GHz band to the 28 GHz band.
4. Ensure that the use of terrestrial IMT/5G in the 26 GHz band does not constrain the use of the entire 27.5-29.5 GHz band for satellite broadband services, including ESIM.

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<sup>11</sup> See *Minutes of 99<sup>th</sup> Meeting (24-28 May 2021) of Working group Frequency Management (WG FM)*, <https://cept.org/ecc/groups/ecc/wg-fm/client/meeting-documents/?flid=28922>

<sup>12</sup> See *ECC Decision (13)01 of 8 March 2013 on the use, free circulation, and exemption from individual licensing of Earth stations on mobile platforms (ESOMPs) in the frequency bands available for use by uncoordinated FSS Earth stations within the ranges 17.3-20.2 GHz and 27.5-30.0 GHz* (amended 26 October 2018; expected publication of post-WRC-19 amendment, June 2021), <https://docdb.cept.org/document/439>.

<sup>13</sup> See *Minutes of 56<sup>th</sup> Plenary Meeting of ECC (28 June – 2 July 2021)*, [https://cept.org/Documents/ecc/65437/ecc-21-057\\_minutes-of-the-56th-ecc-plenary-meeting](https://cept.org/Documents/ecc/65437/ecc-21-057_minutes-of-the-56th-ecc-plenary-meeting).



5. Protect the primary use of the 28 GHz band by satellite receivers.
6. Condition 26 GHz terrestrial IMT/5G base station authorizations on Resolution 242 (WRC-19) out-of-band limits and pointing requirements in order to protect 28 GHz satellite receivers in space.
7. 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 into satellite receivers in the 28 GHz band.
8. Implement CEPT ECC/DEC/(13)01 as amended to validate license exempt ESIM operation in 17.3-20.2 GHz and 27.5-30 GHz bands and further implement ESIM operations with the CEPT regime for user terminals on trains, buses, aircraft and ships.

Viasat supports the implementation of terrestrial IMT/5G in the 26 GHz band and appreciates Austria's consideration of the information above and commitment to the development of satellite broadband services throughout the 27.5-30 GHz and 17.7-20.2 GHz portions of the Ka band, including the 28 GHz band segment. We remain at your disposal to answer any further questions or provide further details as requested.