

Your response

Question	Your response
<p>Question 1: Do you agree with the prioritisation of the agenda items, as shown in Annex 5, and if not why?</p>	<p>Confidential? – Y / N</p>
<p>Question 2: What are your views on the continued need to protect global aeronautical and maritime services, in the 4.8 – 4.99 GHz band, under this agenda item?</p>	<p>Confidential? – Y / N</p>
<p>Question 3a: Do you agree that the UK interest in the bands 3 600-3 800 MHz and 3 300-3 400 MHz in Region 2 (North & South Americas) should be limited to any impacts on UK operational use in those areas?</p>	<p>Confidential? – Y / N</p>
<p>Question 3b: Do you agree that the UK should maintain its objections to changes to the regulatory environment for the band 3300-3400 MHz (in Region 1, Europe, Africa, Middle East), noting UK has interests in use of radar for both ground and airborne operations?</p>	<p>Confidential? – Y / N</p>
<p>Question 3c: What is your view on the use of 6425-7025 & 7025-7125 MHz, and what evidence do you have to support this view? How does that inform your views on a IMT identification in these bands?</p>	<p>Confidential? – N See accompanying document.</p>
<p>Question 3d: What are your thoughts on the current UK view that IMT should not be identified in Region 2 in the band 10-10.5 GHz in order to ensure the protection of the globally operating EESS (active) systems and airborne & vessel mounted radars?</p>	<p>Confidential? – Y / N</p>
<p>Question 4: Do you agree that, where no additional technical limitations are placed on mobile services, the UK can support an upgrading of the mobile allocation, in 3600 - 3800 MHz, from secondary to primary?</p>	<p>Confidential? – Y / N</p>

<p>Question 5: What are your views on the development of regulatory conditions to facilitate deployment of high altitude IMT base stations in IMT identified bands below 2.7 GHz?</p>	<p>Confidential? – Y / N</p>
<p>Question 6: Do you agree that a formal modification to the Radio Regulations is not needed for fixed service applications that use IMT technologies?</p>	<p>Confidential? – Y / N</p>
<p>Question 7: What are your views on the proposed approach for 470-694 MHz, recognising the national decisions already in place and taken for DTT multiplex licensing in the band, and the additional and supplementary spectrum made available for UK PMSE usage?</p>	<p>Confidential? – Y / N</p>
<p>Question 8: What are your views on the need to establish an international regulatory environment that provides adequate protection of UK fixed links from earth stations in motion, in the band 12.75 – 13.25 GHz, which is also practicable from an enforcement/implementation perspective?</p>	<p>Confidential? – Y / N</p>
<p>Question 9: Do you agree that the UK continues to support the maritime distance figure for ESIMs that work to non-geostationary satellites and to test the other conditions agreed at WRC-19 for ESIMs working to geostationary satellites to ascertain whether these remain appropriate for non-geostationary satellites?</p>	<p>Confidential? – Y / N</p>
<p>Question 10: What are your views on whether an allocation to inter satellite links is necessary for existing satellite allocated bands and whether this would provide benefits internationally?</p>	<p>Confidential? – Y / N</p>
<p>Question 11: What are your views on the need for additional satellite allocations in support of narrowband IoT “M2M” type applications, noting that there remains the continued use of PMSE for wireless cameras in the band 2010 – 2025 MHz?</p>	<p>Confidential? – Y / N</p>

<p>Question 12: What are your views on the proposed approach to this agenda item concerning the fixed satellite service in 17.3-17.7 GHz in Region 2?</p>	<p>Confidential? – Y / N</p>
<p>Question 13a: On Topic B, what are your views on the post milestone procedures for non-geostationary satellite systems?</p>	<p>Confidential? – Y / N</p>
<p>Question 13b: On Topic L, what are your views on regulatory conditions for Telemetry, Tracking and Command (TT&C) for NGSO in-orbit servicing?</p>	<p>Confidential? – Y / N</p>
<p>Question 13c: What are your views on the remaining topics currently listed for Agenda Item 7?</p>	<p>Confidential? – Y / N</p>
<p>Question 14: Noting that any UK position will be developed only after the ITU Plenipotentiary Conference, do you have any comments relating to the use of Article 48 that may be addressed at WRC-23?</p>	<p>Confidential? – Y / N</p>
<p>Question 15: What are your views on the need to establish an international regulatory environment for sub-orbital vehicles, which at the same time does not limit flexibility of spectrum options, and retains international safety considerations?</p>	<p>Confidential? – Y / N</p>
<p>Question 16: Do agree that where the adjacent band compatibility issues are addressed and ICAO coordination processes are not compromised, that the addition of an aeronautical satellite (AMS(R)S) allocation to the band can be supported?</p>	<p>Confidential? – Y / N</p>
<p>Question 17: Do agree that functions related to international aviation safety are a matter for ICAO? On this basis, and absent any contrary information from ICAO, should the UK support the development of an international spectrum regulatory framework for UA use of FSS that would support efficient use of spectrum?</p>	<p>Confidential? – Y / N</p>

<p>Question 18: Recognising the recent diminishing industry interest in this item relating to possible modification of the aeronautical HF assignment plan, and the general lack of global interest, do you agree that UK move towards a No Change proposal under this agenda item?</p>	<p>Confidential? – Y / N</p>
<p>Question 19: What are your views on the need for additional spectrum, specifically in the 15 and 22 GHz bands, for non-safety aeronautical use?</p>	<p>Confidential? – Y / N</p>
<p>Question 20: What are your views on Agenda Item 1.11 and the proposed UK position to support modernisation of GMDSS?</p>	<p>Confidential? – Y / N</p>
<p>Question 21: What are your views on the approach to the review of 1240-1300 MHz, recognising that discussions concerning future satellite navigational needs for the UK are a matter for Government?</p>	<p>Confidential? – Y / N</p>
<p>Question 22: What are your views on a new spectrum allocation in the 40-50 MHz range to support and enhance climate monitoring, such as, environmental shifts in ice sheets?</p>	<p>Confidential? – Y / N</p>
<p>Question 23: What are your views on upgrading the Space Research Service allocation, from secondary to primary, in the 14.8-15.35 GHz band?</p>	<p>Confidential? – Y / N</p>
<p>Question 24: What are your views on the potential for defragmentation in this band to facilitate both EESS (passive) use and provide for larger contiguous blocks for fixed & mobile allocations?</p>	<p>Confidential? – Y / N</p>
<p>Question 25: Do you agree that formal international recognition for Space Weather Sensors should be implemented in the Radio Regulations?</p>	<p>Confidential? – Y / N</p>

<p>Question 26: What are your views on the limits proposed to protect EESS (passive) under Agenda Item 9.1 topic d) and do you have any views on which of these limits might be accommodated in the Radio Regulations and how?</p>	<p>Confidential? – Y / N</p>
<p>Question 27: Do you agree that the formalised time reference in common global use, is not a matter of spectrum regulation?</p>	<p>Confidential? – Y / N</p>
<p>Question 28: Do you have any comments concerning the Standing Agenda Items, where not covered elsewhere in this document?</p>	<p>Confidential? – Y / N</p>
<p>Question 29: Do you have a view on any of the footnotes to which UK is a party?</p>	<p>Confidential? – Y / N</p>
<p>Question 30: Are you aware of any specific issues, not covered elsewhere in this document, which are likely to be raised in this part of the Director’s Report and of which you think Ofcom should be aware?</p>	<p>Confidential? – Y / N</p>
<p>Question 31: Do you have any comments on Agenda Item 9.3 considering Resolution 80?</p>	<p>Confidential? – Y / N</p>
<p>Question 32: What changes to the Radio Regulations have you identified that would benefit from action at a WRC and why? Do you have any proposals regarding UK positions for future WRC agenda items or suggestions for other agenda items, needing changes to the Radio Regulations, that you would wish to see addressed by a future WRC?</p>	<p>Confidential? – Y / N</p>
<p>Question 33: What are your views on the use of IMT stations that use antennas that consists of an array of active elements, in bands shared with satellite services?</p>	<p>Confidential? – Y / N</p>

Response to Ofcom Consultation on UK preparations for the World Radiocommunication Conference 2023 (WRC-23)

Centre for Advanced Communications, Mobile Technology and IoT, University of Sussex

The Centre for Advanced Communications, Mobile Technology and IoT (ACMI) (<https://www.sussex.ac.uk/research/centres/acmi/>) at the University of Sussex and its 6G Lab (<https://6g-lab.org>) conduct research in wireless communications, networking, and spectrum technologies for 5G, beyond-5G and 6G mobile communications, satellite communications and next generation Wi-Fi, as well as communication and sensor technologies for IoT. A strong focus of our Centre is energy efficient wireless communication technologies, architectures, and smart deployment strategies for mobile netzero, with applications in a range of verticals including transportation, energy and environment sectors. We are co-PI on the UKRI/EPSCRC funded Network Plus “A green connected and prosperous Britain”¹, an academia-industry partnership with a focus on drastically reducing Co2 emission in the energy sector by developing interconnected communication and energy networks, which seamlessly and energy efficiently integrate and orchestrate renewable energy source as well as electric vehicles in future smart grids².

Focusing on energy efficiency and CO2 emission perspectives, we are grateful for the opportunity to provide our response to Ofcom’s call for input for UK preparations for WRC-23 and Agenda Item 1.2 relating to IMT identification of the 6425-7025 MHz band in Region 1 and 7025-7125 MHz globally.

It is well understood that mobile communication networks provide significant social and economic benefits, including substantial contributions to GDP. It is for this reason that the deployment of advance and high-performing mobile networks is a high strategic priority of many governments around the world. Although the mobile sector is at the very forefront of acting to be net zero by 2050, this is not the biggest contribution the sector can make to climate action. The biggest potential is to help other sectors of the economy reduce their carbon emissions. For example, research conducted by the GSMA with the Carbon Trust in 2019 found³ that 5G and IoT connectivity enables carbon reductions in other sectors that are 10 times larger, equivalent to approximately 4 per cent of global emissions. Major reductions in carbon emission can be achieved in smart city and smart transportation sectors, enabled by mobile communication networks. Towards this end, it is essential that the right amount of spectrum and at the right frequencies is made available for 5G networks. It is well-known in the field of wireless communications and radio engineering that different frequency ranges exhibit different trade-offs between coverage (good radio propagation characteristics) and capacity (availability of wide bandwidths). Notably, low bands (sub 1 GHz frequencies) are suited for relatively low-capacity communications but with very wide-area coverage including outdoor-to-deep-indoor. Mid-bands (1-7 GHz), on the other hand, are essential for high-capacity wide-area mobile services with reasonable outdoor-to-indoor coverage, including high data-rate mobile broadband, smart city applications and intelligent transportation



systems. Finally, high bands (i.e. above 24 GHz) are suited for very high data rates but with low coverage such as for short-range communications at hot-spots. It is also important to note that although the 5G radio access technology (RAT) is theoretically up to 90% more energy efficient per gigabyte than are the 4G standards, the deployment of networks in high bands, in order to address the increase in demand for mobile data across cities, will require many more mobile sites, resulting in increased energy consumption as well as potential interference and mobility issues.

Consequently, we strongly believe that the 6425-7125 MHz band is an essential “spectrum sweetspot” for mid-bands to deliver the required levels of energy efficient performance by macro-cellular mobile networks to citizens and enterprises across wide areas, as well being an enabler for substantial CO2 emission reduction in smart cities, smart transportation and smart grid sectors. We therefore recommend that the UK supports IMT identification of the 6425-7125 MHz band at the upcoming WRC-23.

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