Your response

Hello,

Please see below, the detailed response to the consultation on "UK preparations for the World Radiocommunication Conference 2023 (WRC-23)".

My name is Prof Toktam Mahmoodi. I am the Director of the Centre for Telecommunications Research at King's College London. King's has been at the centre of many scientific and technical discoveries which have enabled the vibrant telecommunications ecosystem we have today.

To ensure that best socio-economic value is provided by wireless communications systems, I am responding to your consultation on UK's preparations for WRC-23. Specifically, we would like to provide feedback on Agenda Item 1.2 which addresses the IMT identification of the 6425-7025 MHz band in Region 1 (EMEA) and 7025-7125 MHz globally.

A critical assumption around spectrum needs is based on capacity and traffic type predictions of the future. Such predictions are based on the type of applications likely to emerge and the type of devices able to support these applications.

An example of the 3G/4G era was the introduction of the iPhone with its app store and native internet capabilities built in. Back then, neither regulators nor network providers could foresee the amount of traffic the iPhone would produce, often with serious consequences.

We are now experiencing a similar moment with the introduction of XR devices. Whilst VR has applications in confined spaces, AR will drive much of the anticipated outdoors metaverse experience for consumers in the near future. Announcements on the launch of AR devices by global tech providers have been made, therefore consolidating the importance of XR in the consumer market.

Capacity analysis done by various industry groups however have shown that the network capacity needed to support these untethered devices and the consumer services is significantly larger than what the ecosystem could realistically provide. A densification of up to 10x would be required which is economically not realistic. Therefore, without proper spectrum to support the outdoors untethered experience, UK consumer experiences will fall behind Asian and other countries around the world.

We therefore support the allocation of more spectrum to IMT, specifically for the evolution of 5G. The upper 6GHz band, which is central to this consultation, is paramount in ensuring proper coverage and capacity for emerging XR services. Indeed, it is the only remaining band which offers a balance of both wide range (thus significantly reducing deployment costs) and capacity (thus enabling emerging consumer services).

Technical co-existence issues of course are still under discussions nfor that band, specifically with the satellite FSS uplink (and downlink). However, most of studies have shown that an IMT system can co-exist with the incumbent FSS UL systems. All studies presmeted show that co-existence is feasible by physycal separation with FSS DL. Another aspect is that the license-exempt community will want to claim parts of the band; however, their indoors and enterprise use has enough capacity in the available mid and high bands to support the required VR usecases, even if duty cycled for power efficiency reasons.

3GPP has recently concluded the specifications of IMT 5G BS and UEs for licensed use in the 6425-7125 MHz band; the new band is N104. Operators around the world are thus ready to obtain the spectrum from the national regulators through auctions, which will boost income for treasuries around the world.

Also, the GSMA has conducted an in-depth study on the various trade-offs of using the 6GHz band. The GSMA intelligence emphasize that the best socio-economic benefit can be derived if the spectrum 5925-7125 MHz is shared between licensed and license-exempt regimes (considering the available options at the moment). This is in-line with Ofcom's own studies on "UK's digital transformation in a competitive world" with a capacity increase of "40% per annum". The US has drawn similar conclusions and has realised that densification is economically not feasible, and is thus looking to liberate more mid-band spectrum.

The 6425-7125 MHz band will be fundamental for 5G Evolution. We recommend that the UK supports the IMT identification of the upper 6 GHz band at WRC-23. Without it, the UK risks of becoming uncompetitive and british citizens will miss one the emerging XR and eMMB+ services.