Your response

Question	Your response
Question 1 – Do you have any comments on the consultation proposals and analysis set out in the January 2020 consultation in light of the additional technical details which we are publishing in this document (see text added in grey boxes in Section 2 and the whole of Section 3)?	Confidential? – N Nokia welcomes Ofcom's initiative to enable greater access to Extremely High Frequency (EHF) spectrum in the 100-200 GHz frequency range on flexible service neutral basis. The shorter wavelengths of frequencies above 95 GHz are well suited for particular technologies and the combination of narrow antenna beams with modest antenna sizes and high total propagation loss (i.e., normal free space loss plus gaseous absorption loss) in the above-95 GHz frequencies would make these frequencies well suited for flexible use without requiring complex sharing arrangements. Moreover, the use of these higher bands for applications like sensing/SRD in the context of 6G is of interest. Nokia agrees with both Ofcom's proposals regarding the licensing regime, with a preference for the licensing approach, as, given the short range of these bands, coexistence with other services should be less challenging. Given the potential of the EHF bands to support a range of new wireless services, Nokia take the opportunity to comment in this second round of the consultation on several aspects: - There is a growing international interest in accessing extremely high frequencies, in the 95 GHz-3 THz frequency range for innovative services and technologies. - While there may be little present interest in using the above-95 GHz spectrum for mobile services, this should not preclude the eventual use of these spectrum bands for shared fixed and mobile use under appropriate service rules while protecting passive incumbent allocations. - In particular, allowing fixed operations in a large contiguous block of spectrum (in the order of a tens of GHz or more blocks) would be of great interest in the

	future, and, as such, any initiative in this direction is welcomed. - Based on the feedback provided to Ofcom's consultation of January 2020, it appears that the mobile community is interested in the use of spectrum in the 100-200 GHz range, but not specifically in the frequencies under consultation. A much higher priority is given to accessing the 92-114.5 GHz and 130-174.8 GHz bands for fixed wireless services, as these bands have potential to be used in future mobile networks. In the US, Nokia – as part of the mmWave Coalition (mmWC), a group of innovative companies united in the objective of removing regulatory barriers to technologies and using frequencies ranging between 95-275 GHz – supports FCC's initiation of proceeding to permit the use of spectrum above 95 GHz for innovative services and technologies via experimental licenses of long term (ten years). Moreover, Nokia working with NTT DoCoMo, demonstrated 5G New Radio (5G NR) enhancements at 90 GHz during the Brooklyn 5G Summit in April 2018[1]. The technology uses a Nokia Bell Labs developed compact millimetre wave phased-array antenna system scalable up to 256-elements using an RFIC solution to enable multi-gigabit per second speeds. The test demonstrated how using the new 5G NR technology at mmWave frequencies can provide greater bandwidth while handling the necessary network management with a large number of antenna beams. In Europe, the mobile community is considering the use of the EHF spectrum in the 100-200 GHz frequency bands for terrestrial services, in particular the D and W bands. CEPT has already approved recommendations for use of these bands by microwave links: ECC REC (18)01 for D band and ECC REC (18)02 for W band. These bands could also be considered in the context of fixed-mobile convergence and the emergence of new mobile technologies (not yet defined).

[1] https://www.fiercewireless.com/wireless/nokia-docomo-to-demo-5g-nr-at-90-ghz-during-brooklyn-5g-summit

	For the fixed services, these bands have also been studied by the ETSI ISG mWT (documents ETSI GR mWT 008 v1.1.1 (2018-08) for band D and ISG mWT ETSI GRSI mWT 018 v1.1.1 (2019-08) but are not yet integrated into the last version of the TM4 standard for microwave links (EN 301 217 version 2020). We expect that standards bodies will finalise the specifications for these bands in their future releases. Nokia sees this Ofcom proposal as a generalization of the ECC 190 Report for the 122-122.25 GHz band which considered compatibility between the EESS and the SRDs, providing: - An extension of the band accessible to SRDs - An increase of permitted power under licensed conditions. Licencing such spectrum would allow a better control of higher power devices in order to protect the EESS. Nokia appreciates the effort made by Ofcom to clarify the hypotheses and assumptions that were at the basis of the results presented to the first consultation on the 100-200 GHz band. When considering these assumptions (for instance, all devices operating at maximum power with a duty cycle of 100%), Nokia is of the view that the simulations represent a worst case scenario and that the real impact of the introduction of low power devices on EESS sensors in the considered bands would be lower than evaluated in the studies.