Nokia

Your response

Question	Your response
Question 1: (Section 4) Do you agree with our proposals on the coverage obligations as set out in this section? Please give reasons supported by evidence for your views.	Confidential? – Y / N
Question 2: (Section 5) Do you agree that we have identified the correct competition concerns?	Confidential? – Y / N
Question 3: (Section 5) Do you agree with our assessment of these competition concerns, and our proposed measure for addressing them? Please give reasons supported by evidence for your views.	Confidential? – Y / N
Question 4: (Section 6) Do you agree with our proposal to proceed with a conventional assignment stage?	Confidential? – N Nokia, in line with Commission Implementing Decision (EU) 2019/235 of 24 January 2019 on amending Decision 2008/411/EC as regards an update of relevant technical conditions applicable to the 3400-3800 MHz frequency band, agrees that sufficiently large portions of contiguous spectrum, preferably 80-100MHz per operator is needed to facilitate the provision of all 5G use cases. Spectrum trading or rearrangement of the existing operator spectrum blocks at 3.5GHz band looks as of particular importance for the defragmentation of the whole 3.4-3.8 GHz band and the only feasible way forward. This should be encouraged by the auction rules and regulations.
Question 5: (Section 7) Do you agree with our proposal to use a CCA design for this award?	Confidential? – Y / N

Question 6: (Section 7) Do you have any comments on the proposed detailed rules for our CCA design?	Confidential? – Y / N
Question 7: (Section 8) Do you agree with our proposed approach to coexistence in the 700 MHz band?	Confidential? – N On the basis of the experience from the 800 MHz band, Nokia supports Ofcom views that a less prescriptive approach should be adopted, with less burden conditions and costs to the mobile licenses owners. Nokia, as not directly concerned by the auction, considers that the candidates for spectrum ownership are better placed to answer on their preferred views in the context of this approach, on the basis of the 800 MHz experience.
Question 8: (Section 8) Do you have any comments on the proposed licence obligation and guidance note (annex 19)?	Confidential? – Y / N
Question 9: (Section 9) Do you agree with our proposed approach to managing interim protections for registered 3.6-3.8 GHz band users?	Confidential? – N Taking into account the small number of fixed links stations and SES with notice periods lapsing between June 2020 and December 2022, we suggest that the technical data for base stations located at a distance higher than a certain value (for instance 100 km) from any of these stations should be exempt of the obligation to provide technical information to Ofcom.
Question 10: (Section 9) Do you agree with our 3.6-3.8 GHz in-band restriction zone proposals?	Confidential? – N Nokia agrees with the principle of ensuring that the signal received from any base station in a restricted zone around a SES not be higher than a given threshold. We also suggest to take into account in the calculations the presence of permanent obstacles between the base station and the SES that could result from certain terrain profiles, for instance a hill intercepting the direct path between the base station and the SES. We equally suggest to vary from the free space lobe model in these cases.
Question 11: (Section 9) Do you agree with our view that we do not need to include any specific conditions in 3.6-3.8 GHz licences to mitigate the risk of adjacent band interference?	Confidential? – N Nokia fully supports Ofcom's conclusion that there is no need for specific conditions in the 3.6-3.8 GHz licenses to ensure co-existence with fixed links and SES operating above 3.8 GHz.

Question 12: (Section 10) Do you agree with the non-technical conditions that we propose to include in the licences to be issued after the award of the 700 MHz and 3.6-3.8 GHz bands?	Confidential? – Y / N
Question 13: (Section 11) Do you agree with the technical licence conditions we propose?	Confidential? – N <u>Related to indoor small cells:</u> It is not clear from the Ofcom draft license requirements whether the out of band emissions requirement for co-existence with military radar (-50dBm/MHz EIRP emissions limit below 3390MHz) should apply to indoor small cells. Nokia's position is that the requirement set in CEPT for outdoor is too onerous to be applied to indoor small cells and recommend a relaxation of 15-20dB from the outdoor specification based on the following: - Typical indoor-> outdoor attenuation will be of the order of 15-20dB therefore providing this level of relaxation could be done without risk of interference to military radar o Measurements results collated by ITU in ITU-R P2346 at 3.5GHz (section 7) show that building attenuation varies from 16dB mean with std dev of 2.5dB up to 25dB mean loss with a std dev of 4dB o Indoor small cells are typically deployed in urban areas which will be geographically separated from military radar o Indoor small cells will be professionally installed on ceilings and walls to maximise indoor coverage and to minimise external interference from outdoor macro. Attenuation from indoor to outdoor will therefore be typically higher than if placed near windows - CEPT guidelines specifically exclude indoor small cells from the level set for outdoor base stations o the equivalent requirement in CEPT Report 67 (derived from ECC Report 281) sets a limit of -52dBm/MHz TRP and is discussed in section 5.2. Table 4 specifically states 'The additional baseline power limits given in Table 4 are applicable only to outdoor cells. In the case of an indoor cell, the power limits can be relaxed on a case by case basis o ECC Report 281 which contains the analysis for the CEPT Report67 guidelines seems to be the basis for the Ofcom specifications. In table 6 (pg16) the given requirement for non-AAS base stations is -50dBm/MHz EIRP in line with the Ofcom draft license conditions. However, the report states: "In addition, the levels given in Table 6 are applicable only to outdoor cells. In case of

	indoor deployments, the levels can be relaxed on a case by case basis". This caveat was not carried across to the Ofcom requirements whether intentionally or un-intentionally. o Report 281 does not seem to simulate scenarios with indoor small cells but it assumes that some UEs are based indoors and make allowance for building entry loss (according to ITU-R P.1812-4) - The cost of meeting the outdoor specification on indoor products will mean that less indoor areas can be covered in a cost efficient manner and this will reduce 5G coverage for consumers. o The emissions limit at 3390MHz is challenging since there is minimal transition spectrum at the band edge. A larger, more expensive filter would be required which will significantly increase the size and cost of the indoor unit. o The cost of indoor deployment is very sensitive to the cost of the radio head/picocell and therefore this component needs to be cost optimised for indoor deployments. o Meeting the specification in the 'standard' form factor used elsewhere (e.g. US & China) would require the filter bandwidth is reduced to 3460 – 3580 MHz, penalising the owners of spectrum in the lower part of the band. Given existing studies indicate that the specification for emissions below 3400MHz can be relaxed for professionally installed indoor small cells without impacting interference levels, that the CEPT guidelines were only intended for outdoor small cells, and that imposing outdoor emissions limits could impact the deployment of 5G indoors, Nokia proposes that a relaxation of 15-20dB is provided for such indoor small cells in this frequency band. <u>Related to TDD synchronization:</u> ECC Report 296, approved by ECC#50 (March 5-8, 2019) gives evidence of the need for synchronisation between TDD licensees, especially when AAS is installed. Nokia agrees with Ofcom's proposal to include in the 3.6-3.8 GHz licenses the same synchronisation requirements already set out in the 3.4-3.6 GHz licenses. This will give the possibility to work without guard band at 3.6 GHz between blocks attributed to licensees just below and just above 3.6 GHz. Concerning the shared band 3.8-4.2 GHz, subject to a parallel consultation, Ofcom "assumes that new base stations above 3.8 GHz will be unsynchronised with base

	stations below 3.8 GHz" and proposes that a 5 MHz guard band be provided in the band 3800-3805 MHz. Nokia supports this approach to put the guard band within the shared spectrum range 3800-4200 MHz and to allow operation of MFCN in the band 3.6-3.8 GHz up to the upper limit of 3800 MHz.