Your response

Question	Your response
Question 1: Do you have comments on the overall approach to the review?	Confidential? – N UKWISPA welcomes the approach taken by Ofcom, which we think is a very welcome refresh of Ofcom's often over-cautious approach to spectrum management.
Question 2: Have we captured the major trends that are likely to impact spectrum management over the next ten years?	Confidential? – N Yes, we believe so.
Question 3: Could any of the future technologies we have identified in Annex 6, or any others, have disruptive implications for how spectrum is managed in the future? When might those implications emerge?	Confidential? – N Predicting future technologies is clearly difficult and we think that Ofcom has captured these very well. We think that AI and self-organising networks will have an impact on spectrum management in the future. In particular, we believe that it will be important to monitor and set policies around the balance between centrally controlled ML spectrum management and device or network-controlled systems. Using such technology in a uniform or mutually informed manner will be vital to its success. We estimate that there is still some time to go in maturing such technologies but welcome the fact that Ofcom is considering this at such a relatively early stage.
Question 4: Do you agree that there is likely to be greater demand for local access to spectrum in the future? Do you agree with our proposal to consider further options for localised spectrum access when authorising new access to spectrum?	Confidential? – N We emphatically agree that there will be a demand for local access spectrum in future. We do agree with Ofcom's proposal to consider further options for localised spectrum management, but more consultation would be helpful when specifying some of the detailed implications of some of the proposals. In particular, the CBRS model from the USA does have merit and has been successful in many ways, but is not perfect and we would like to

	work with Ofcom to ensure that dynamic spectrum access is implemented in ways that are affordable, manageable and supported by a wide range of equipment vendors before implementation.
Question 5: Do you agree with the actual and perceived barriers identified for innovation in new wireless technologies, and our proposed ways of tackling those?	Confidential? – N We agree with the perceived and actual barriers to innovation and welcome Ofcom's proposed ways of tackling them.
Question 6: Do you agree with Ofcom's proposals to improve our outreach and reporting activities, and spectrum information tools? • **Are there additional ways that Ofcom could better engage with existing and future users and providers of wireless communications?** • **Please explain any specific areas where you believe more or better provision of information could provide value to stakeholders**	Confidential? – N We agree that Ofcom could do more with such outreach programmes. Ofcom identified users as 'spectrum aware' and 'less spectrum aware'. This distinction is helpful, but we think that Ofcom needs to give much higher consideration to the latter group. We have seen examples where users wishing to make use of wireless technology and innovation find the current spectrum map and UKFAT etc. are extremely intimidating and confusing. In some cases, this has led to users seeking guidance from manufacturer and distributor websites which in turn leads to inappropriate equipment being deployed (including out of band and outside of the UK regulatory framework). We respectfully suggest that two-tier interactive tools that are based around certain use cases may help, whereas existing tools tend to be frequency-orientated. For example, rather than searching geographically and by frequency (which presumes a pre-existing awareness of which frequencies are appropriate for certain use cases), searching based on categories such as mobile, CCTV, FWA (or wireless broadband), consumer gadgets etc. would be much more engaging and helpful. Suffice it to say that the current, more technical searching criteria should remain for the benefit of more spectrum-aware users.
Question 7: Do you agree that it is important to make more spectrum available for innovation before its long-term use is certain? Do you have any comments about our proposed approach to doing this?	Confidential? – N We agree that it is important to make more spectrum available for innovation for the reasons set out by Ofcom. This, together with a

	continually reviewed Spectrum Roadmap will be very beneficial. 3.8-4.2 GHz is such an example but since equipment availability is inevitably constrained and therefore expensive, it will be important to provide security of tenure for the user until the equipment has paid back its investment. While the specification for the band may get enhanced the operation of the older innovative equipment may need to be allowed for an extended period.

Question 8: Do you agree that it is important to encourage spectrum users to be 'good neighbours' to ensure more efficient use of the spectrum? Do you agree with our proposals to:
    a) **increase realism in coexistence analysis at a national and international level?**
    b) **encourage spectrum users to be more resilient to interference?**
    c) **ensure an efficient balance between the level of interference protection given to one service and the flexibility for others to transmit?**
Do you have any comments on which of these will be the most important?
	Confidential? – N
	
	We emphatically agree with the encouragement of good neighbourhood and this is already a key element of UKWISPA's requirements to attain Gold Accreditation for FWA operators.
	
	We agree with points a, b, and c. Our only concern is that 'encouragement' for users to be more resilient to interference will need to be implemented very sensitively in some cases, as such generalisations may lead to a perception of penalty rather than encouragement to improve. For bands where licence-exemption is applied, Ofcom could consider refining Interface Requirements to achieve better interference protection. Increased receiver gain, MIMO and beam-steering are all examples that could be specified in certain applications and further encouragement applied by incorporating different power restrictions where such technologies are used compared to where they are not.

Question 9: Are there any other issues or potential future challenges that should be considered as part of this strategy?	Confidential? – N We have no further suggestions at this time.
Question 10: Do you agree that continued use of our existing spectrum management tools (as set out in sections 4-7) will be relevant and important for promoting our objectives in the future, in light of future trends?	Confidential? – N Ofcom's existing spectrum management tools will need to be developed significantly to embrace the additional frequencies and more flexible and dynamic needs of the UK's spectrum use in future. It is very encouraging to see that Ofcom recognises this and that some

	systems are already starting to be improved. Without significant improvements in the tools that appear to be at Ofcom's disposal today, it is hard to imagine how the overall vision set out by Ofcom could be delivered.
Question 11: Is there anything else we should be considering doing, or doing differently, to promote our objectives?	Confidential? – N Only the points set out above. We think that more intelligent and dynamic spectrum management will lead to more innovation and opportunities to dramatically improve efficiency. We would warmly welcome further encouragement by Ofcom to use technologies such as MIMO across more applications, such as point to point links, as well as future 'smart' alternatives to the current DFS requirements.