

## Your response

Question	Your response
<p><b>Question 1:</b> Have we correctly identified the key changes in the utilities sector that could lead to additional spectrum requirements?</p>	<p>Confidential? – Y / N</p>
<p><b>Question 2:</b> What alternative communication solutions might play a role in meeting the future operational communication needs of the utilities sector, alongside or instead of additional spectrum for a private network?</p>	<p>Confidential? – Y / N</p>
<p><b>Question 3:</b> Are there any other spectrum bands we should consider for use by utilities?</p>	<p>Confidential? – Y / N</p>
<p><b>Question 4:</b> Do you have any comments on the three bandwidths we have considered that might be necessary to support a private network for utilities? Please reference our capacity analysis in annex 7 where relevant.</p>	<p>Confidential? – Y / N</p>
<p><b>Question 5:</b> Do you have any comments on our approach to examining each potential candidate spectrum band, including the factors relevant to assessing suitability, and the capacity and coverage analysis provided in annexes 7 and 8?</p>	<p>Confidential? – Y / N</p>

**Question 6:** Do you have any comments on our overview of the 400 MHz band in NI? Please consider the specific factors we have discussed in your response.

Confidential? – Y / N

**Question 7:** Do you have any comments on our overview of the 450 MHz band in GB and NI? Please consider the specific factors we have discussed (including the coexistence analysis in annex 9) in your response.

Confidential? – N

For the BBC, this band remains a vital element of our daily operations. It is used for production talkback, and particularly for outside broadcasts and newsgathering (collectively known as PMSE). These are crucial parts of the BBC's programme making and contributes to output that supports its public purposes.

We welcome that the heavy reliance on the 450MHz band by the PMSE sector is recognised and well reflected within the document.

Analogue FM systems continue to offer the required flexibility and low latency required for production and no alternative technologies yet challenge their dominance in the PMSE sector. If the decision is made to introduce LTE services in Bands 31 and/or 72 there is liable to be an impact on existing PMSE use. It seems unlikely that alternative suitable spectrum of sufficient quality and quantity can be identified. Migration to new spectrum will incur costs to the sector in terms of disruption and infrastructure. It will not simply be a case of retuning existing active equipment. Bespoke antenna, combiner and diplexer equipment may also need to be replaced and PMSE licensees will need to be compensated.

There are also potential compatibility issues with Digital Terrestrial TV transmission above 470 MHz, which presents a similar issue to that experienced when clearing the 700 MHz and 800 MHz bands. In those cases, an extensive programme of modifying DTT receiver system was put into place to mitigate potential interference, and without careful management, a similar programme might be required were this band to be implemented for utilities' use.

However, we note that there are some significant differences between the use of a mobile-type network below 470 MHz and the previous

deployment of public mobile networks in the 700 and 800 MHz bands:

- The duplex arrangement for the utilities' radio is not yet determined.
- In the case of deployment of mobile in the 800 MHz band, the mobile downlink was adjacent to DTT reception, with only a small frequency separation, whereas in the 700 MHz band, the mobile uplink was closer to DTT reception.
- The frequency separation between DTT and mobile in the 800 MHz band was as low as 1 MHz in some parts of the country (depending on which transmission channels were in use in each area). Again, it is not yet clear what frequency separation might be used if the 450-470 MHz band were to be used for utilities.
- Mitigations in previous cases largely consisted of adding low-pass filters into DTT receiver systems or, where appropriate, replacing masthead amplifiers to avoid overloading or intermodulation. The latter case would have resulted in many poor-quality masthead amplifiers being removed, so we might expect fewer such issues in the event of a utilities' radio deployment below 470 MHz.
- In the case of a utilities' network, we note that the uplink transmissions will originate from known, fixed locations, and will not be mobile in the sense that mobile networks' UEs are. This presents a different interference scenario to that experienced in the 700 and 800 MHz bands uplinks, as we might expect utilities' uplinks to use higher power, and higher antenna gain, than MNO networks' UEs. Such uplinks might appear to be more similar in that respect to traditional downlinks, and might need to be analysed in that way.

In short, until more details are available of any planned frequency arrangement to be used in the 450-470 MHz band, and power limitations

	<p>that may be imposed on uplinks and downlinks, it is difficult to estimate the quantum of any interference to DTT that might arise. More work will be needed to understand this. We note that the interference analysis in Annex 9 does not address this.</p>
<p><b>Question 8:</b> Do you consider that changes in the spectrum environment for the 450 MHz band mean that there is a case for re-examining whether this band should be reconfigured in the UK to align with the harmonised band plan?</p>	<p>Confidential? – N</p> <p>In the early 2000s, Ofcom reviewed reordering the entire UHF2 band to match the rest of Europe and align base and portable ranges. An advanced plan was produced that addressed concerns regarding PMSE, but the decision was taken not to proceed, not least because of the cost and disruption involved.</p> <p>The BBC has no view on whether the UK should now align with an internationally harmonised LTE band-plan, but if Ofcom does decide to consider such a move, PMSE use needs to be similarly considered again. The costs and disruption to the BBC and the wider PMSE sector would need to be addressed by Ofcom, including a consideration of whether important areas such as news and outside broadcasts are affected.</p>
<p><b>Question 9:</b> Do you have any comments on our overview of the 700 MHz band in GB and NI? Please consider the specific factors we have discussed in your response.</p>	<p>Confidential? – Y / N</p>
<p><b>Question 10:</b> Do you have any comments on our overview of the 800/900 MHz band in NI? Please consider the specific factors we have discussed in your response.</p>	<p>Confidential? – Y / N</p>
<p><b>Question 11:</b> Do you have any comments on our overview of the 1900 MHz band in GB and NI? Please consider the specific factors we have discussed in your response.</p>	<p>Confidential? – N</p> <p>The range 1900-1920MHz is immediately adjacent to lower power DECT services which are heavily used by the PMSE sector for production talkback systems. The introduction of adjacent LTE services and protection of DECT, an internationally harmonised band, will need to be</p>

	considered, potentially with suitable guard bands above 1900MHz.
<b>Question 12:</b> Which band(s) do you consider we should examine further with a view to developing consultation proposals to enable their use in a private network, if this were needed? Please reference the factors we have considered where appropriate and provide separate answers for GB and NI if relevant.	Confidential? – Y / N