

# Arqiva Submission: UK preparations for the World Radiocommunication Conference 2023 (WRC-23) – UK provisional views and positions for WRC-23

## Executive summary

Arqiva welcomes the opportunity to respond to Ofcom's Call for Input on preparations for the World Radiocommunication Conference 2023 (WRC-23). At this WRC, under agenda item 1.5., the future of digital terrestrial television (DTT) services will be determined. DTT is relied on by millions of people across the UK and will continue to be depended on as a reliable, universal, free-to-air service for decades to come. Protecting the spectrum arrangements that make delivering this service possible must remain a high priority. Given this, the comments and evidence provided in this response focus primarily on WRC-23 agenda item 1.5.

Through this agenda item, nations will decide whether to maintain the current spectrum arrangements that deliver DTT and other services or change the spectrum arrangements so that countries can use the spectrum for mobile services. Only the former option – a No Change decision – provides certainty that viewers will continue having access to DTT's high-quality, diverse, and widely available programming. Further, an outcome of No Change on this agenda item aligns with the UK Government's recent decision to extend DTT multiplex licences until at least 2034; a decision which reflects the ongoing importance of DTT in delivering services, including public service broadcasting, across the country. The other option – a co-primary mobile allocation – would pose significant risks to the future of this vital platform.

The DTT service is woven into the fabric of national life. It is used by over 16 million UK households<sup>1</sup>, providing a wide range of free-to-air programming that entertains, informs, and brings communities together. The platform's availability across 98.5% of the country underpins the provision of public service broadcasting. The broad appeal of DTT and its success in reaching viewers has been recently reflected by growth in the number of commercial broadcasters on the platform, with Sky Arts, GB News, and TalkTV recently launching new DTT channels.

Importantly, DTT is free at the point of use, enabling widespread access to national events including reporting on the Queen's death and funeral, the accession of the King, as well as events such as Glastonbury and Euro 2022. People do not have to pay for a broadband plan or monthly subscription fee for DTT, as is the case with streaming services.

The cost-of-living crisis and mass cancellation of streaming subscription services<sup>2</sup> has provided a reminder of the need to safeguard access to DTT. Millions of people cannot afford, or do not want to pay for, IPTV services. Ofcom's own research has found that 6% of the population does not have internet access at home<sup>3</sup>, and research from Ipsos has found that 13% of adults in Great Britain say they cannot afford to pay for services with monthly charges to watch their favourite TV shows.<sup>4</sup> Further, full-fibre infrastructure across the entirety of the UK is not expected to be achieved in the next decade, with many continuing to depend

<sup>1</sup> Ofcom, 2022, *Media Nations 2022: Interactive report*, <https://www.ofcom.org.uk/research-and-data/tv-radio-and-on-demand/media-nations-reports/media-nations-2022/media-nations-2022-interactive-report>.

<sup>2</sup> Kantar, July 2022, *Half a million Brits leave the streaming market*, <https://www.kantar.com/inspiration/technology/half-a-million-brits-leave-the-streaming-market>.

<sup>3</sup> Ofcom, 2022, *Online Nation 2022 report*, <https://www.ofcom.org.uk/research-and-data/internet-and-on-demand-research/online-nation/interactive>.

<sup>4</sup> Ipsos, June 2022, *The importance of Digital Terrestrial Television and Broadcast Radio*, [www.arqiva.com/Importance\\_of\\_Broadcast.pdf](http://www.arqiva.com/Importance_of_Broadcast.pdf). Ipsos interviewed a sample of 3,000 participants aged 18+; 2,005 across GB and 1,001 living in postcodes most likely to have been served by the Bilsdale transmitter. Interviews were conducted via telephone interview between 26 January and 4 March 2022. Technical note found in the full report: [www.arqiva.com/Importance\\_of\\_Broadcast.pdf](http://www.arqiva.com/Importance_of_Broadcast.pdf).

on DTT for reliable access to TV.<sup>5</sup> There are also about 10 million people that lack basic digital skills.<sup>6</sup> In the decades ahead, DTT provides certainty that all audiences, regardless of age, income, location, and their level of digital skill, have access to TV and the information, entertainment and connectivity it provides.

A deterioration of DTT would impact all audiences, but it would have the greatest impact on more vulnerable audiences who rely on it the most. This includes the elderly. Ipsos research has found that people 65+ were more likely to be solely dependent on DTT for TV.<sup>7</sup> Further, Ofcom's 2022 Online Nation report indicates that 20% of people 65+ do not have internet access at home.<sup>8</sup> The elderly are also more likely to lack the digital skills that would enable them to use other services. More rural and remote locations that have poorer internet quality or lack connectivity entirely are also more dependent on DTT services. Even as internet connectivity improves, DTT will continue to broadly appeal as a high-quality platform delivering diverse programming on a free-to-view basis. Further, DTT will continue playing a vital role in the resiliency of the UK's information and communications infrastructure – helping ensure widespread access to trusted news and information as risks of cyber-attacks increase.

The value of DTT, and the potential impact of losing this service, is well recognised by viewers. Recent research from Ipsos highlights that 73% of adults in Great Britain consider DTT important if not essential. Over half (54%) considers it *essential* or *very important* that Freeview through an aerial continues to be provided as a free service (see Figure 1). Without DTT, people agree they would find it “very hard” to keep up with news and important information (38%), entertain themselves (23%), or feel very lonely (25%). When people experience a loss of service, as occurred to viewers in Bilsdale in late 2021<sup>9</sup>, the impacts are found to be more severe than people imagine.

Ipsos' findings confirmed that people want broadcast services to continue being available. Nine in ten adults (90%) across Great Britain want to see continued support for broadcast services. Almost the same proportion, 85%, believe Government or their local MP should actively support the continued provision of these services. We can expect, based on current usage and reliance on DTT, that the DTT platform will continue to play a vital role in the UK through to 2040 and beyond.

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<sup>5</sup> See Openreach response to the Lords Communications and Digital Committee's hearings on BBC future funding. House of Lords Communications and Digital Committee, 1<sup>st</sup> Report of Session 2022-23, *Licence to change: BBC future funding*, <https://committees.parliament.uk/publications/23091/documents/169130/default/>.

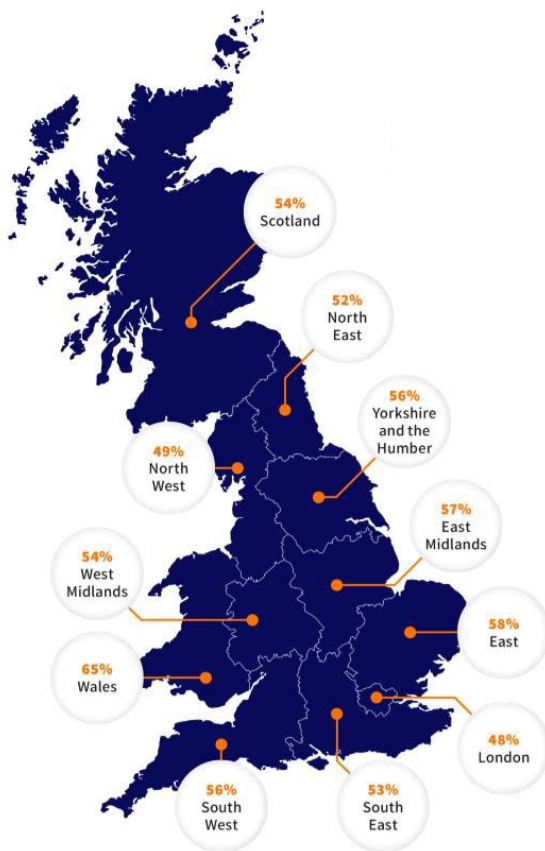
<sup>6</sup> Lloyds Bank, 2021, *Essential Digital Skills Report 2021*, [https://www.lloydsbank.com/assets/media/pdfs/banking\\_with\\_us/whats-happening/211109-lloyds-essential-digital-skills-report-2021.pdf](https://www.lloydsbank.com/assets/media/pdfs/banking_with_us/whats-happening/211109-lloyds-essential-digital-skills-report-2021.pdf).

<sup>7</sup> Ipsos, June 2022, *The importance of Digital Terrestrial Television and Broadcast Radio*, [www.arqiva.com/Importance\\_of\\_Broadcast.pdf](http://www.arqiva.com/Importance_of_Broadcast.pdf). 18% of those 65+ watched only Freeview via an aerial in the past year.

<sup>8</sup> Ofcom, 2022, *Online Nation 2022 report*, <https://www.ofcom.org.uk/research-and-data/internet-and-on-demand-research/online-nation/interactive>.

<sup>9</sup> In August 2021, the Bilsdale TV and radio transmitter caught fire and had to be taken down. This resulted in over 600,000 homes temporarily losing access to DTT and broadcast radio services. Arqiva, 2021, *Latest update on incident at Bilsdale mast*, <https://www.arqiva.com/news-views/news/update-on-incident-at-bilsdale-mast>.

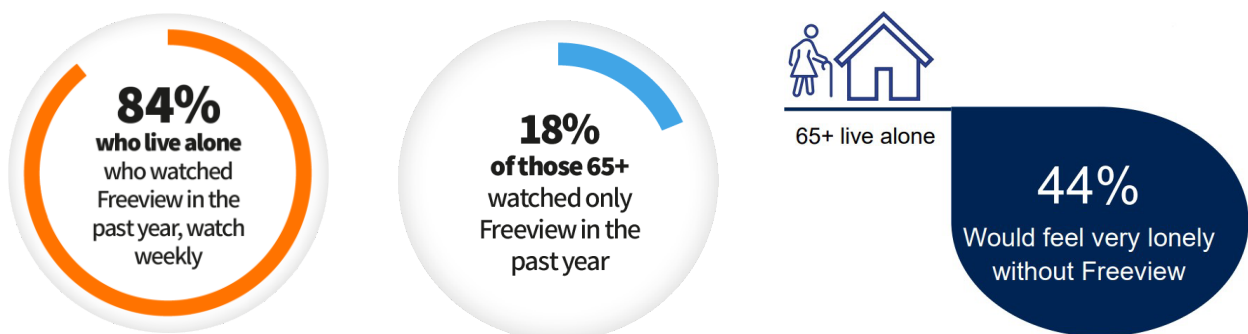
Figure 1: Extent to which continued provision of Freeview services through an aerial as free services is considered essential or very important by region



Note: Lowest sample size, North East, n = 75, highest = South East n = 295

Source: Ipsos research. [www.arqiva.com/Importance\\_of\\_Broadcast.pdf](http://www.arqiva.com/Importance_of_Broadcast.pdf)

Figure 2: Freeview via an aerial reliance by more vulnerable demographics



Source: Ipsos research. [www.arqiva.com/Importance\\_of\\_Broadcast.pdf](http://www.arqiva.com/Importance_of_Broadcast.pdf)

Further, it is important to acknowledge that any decision to change the current spectrum arrangements for DTT will have broader impacts, as this spectrum is shared with programme-making and special events (PMSE) technologies. PMSE services are critical in delivering TV, film, live sport, theatre, live music, newsgathering, and a wide range of events. Demand for PMSE can be expected to increase alongside growth in content production in the UK, which is a significant contributor to the UK economy. While DTT and PMSE can share spectrum, PMSE is unable to share spectrum with mobile services. Further, if the spectrum is allocated to mobile, PMSE has no other spectrum allocated which it could use.

**Given the above, we strongly support Ofcom's view that a No Change position would meet the UK's interests. This would defend the spectrum arrangements which underpin the ongoing provision of DTT and PMSE.**

With its respected position internationally, Ofcom has the opportunity at WRC-23 to lead discussion amongst delegates to protect the delivery of DTT and PMSE. The UK's departure from the European Union further provides greater latitude for Ofcom to demonstrate leadership on this issue. Ofcom must be proactive to deliver a No Change outcome on WRC-23 agenda item 1.5, or there is a risk that an unfavourable decision will be taken that would impact UK viewers. This includes defending a No Change decision through international fora such as the European Conference of Postal and Telecommunications Administrations (CEPT) and engaging with other administrations to build their support for a No Change outcome.

A No Change decision would align with Government policy on DTT. Recently, the Government extended DTT multiplex licences until at least 2034. This reflects the ongoing need for DTT across the UK to deliver TV services. A co-primary mobile allocation, by comparison, would be disjointed with this decision and appear to unwind Government support for DTT, creating uncertainty for industry that ultimately impacts investment in the DTT platform by all market players. Further, Ofcom has been asked to review market changes in content distribution by 2025. A co-primary mobile allocation would undermine the DTT platform in the UK ahead of Ofcom facilitating this national discussion.

We are therefore concerned that despite having a preliminary position of No Change, Ofcom indicated it is open to proposals for "greater flexibility". Stakeholders advocating for a co-primary mobile allocation have argued this would provide "flexibility", and it is disappointing that this language is reflected in the Call for Input for two key reasons. First, there is no evidence a co-primary allocation provides flexibility, due to the need to manage interference risks between services. Second, a co-primary mobile allocation poses real risks to both DTT and PMSE services in the UK.

A co-primary mobile allocation creates the risk that the UK will face international pressure to change its use of spectrum and new interference challenges. Technical studies and experiences with the 700 MHz and 800 MHz band clearances have demonstrated that DTT and mobile services cannot share the same spectrum band over great distances due to interference; in some cases, several hundred kilometres.<sup>10</sup> A co-primary decision would be likely to result in the UK's neighbours, who are less dependent on DTT, using the band for mobile services, creating interference risks across borders.

We note that Ofcom commits to the continued use of DTT, in full compliance with the Radio Regulations. However, as Ofcom acknowledges, the UK's continued use of DTT would impact mobile services in neighbouring countries. This would result in greater pressure on the UK to change its use of spectrum. To ensure decisions on "the future use of this band in the UK rests with the UK authorities" – which Ofcom states is a priority – the regulator must strongly advocate for No Change. Further, notwithstanding the higher power of DTT signals, the UK's TV signals would still be at risk of interference from mobile networks in neighbouring countries, in particular France, Belgium, the Netherlands, and Ireland. DTT coverage around the coasts and in Northern Ireland could be eroded.

A co-primary mobile allocation will also undermine the viability of DTT by deterring industry investment. The success of DTT in the UK is the result of the participation of various market players, including global device manufacturers, broadcasters, and operating system developers. Guaranteed access to spectrum enables

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<sup>10</sup> ITU-R, 2021, *National field reports on the introduction of IMT in the bands with co-primary allocation to the broadcasting and the mobile services*, <https://www.itu.int/pub/R-REP-BT.2301-3-2021>.

these market players to invest in the DTT ecosystem including TV sets, broadcast TV content, and investments in the network infrastructure itself. Over the past decade, DTT has lost significant spectrum to mobile, and in each instance a co-primary mobile allocation resulted in DTT being removed from the band. If the spectrum DTT uses is not defended at WRC-23, this would send a signal that DTT's long-term access to spectrum is not secure and undermine any business case for investment. This includes investment from global TV manufacturers and operating system developers into interfaces for accessing live linear content, research and development into TV sets enabling access to DTT, and potential long-term investment from broadcasters in DTT distribution. Uncertainty would also reduce the incentive for any potential investments that could improve the energy efficiency of the DTT network and reduce carbon emissions or introduce further HD services on the platform. Ultimately, this would harm the capacity of DTT to compete in the market and impact the millions of viewers that use and rely on the service.

In weighing the risks of a co-primary mobile allocation, it is also essential to factor in that mobile services do not require additional spectrum. The mobile sector has been awarded significant spectrum and as highlighted in a recent Ofcom discussion paper, "existing mobile spectrum holdings and spectrum already planned for release are likely to be broadly sufficient to meet future demand to 2030".<sup>11</sup> The mobile industry also has the opportunity to use its significant existing spectrum holdings more efficiently, and this should be Ofcom's focus. For example, mobile could better use existing spectrum resources and invest in infrastructure to improve mobile coverage in rural areas. Additional spectrum is not needed to improve capacity in rural locations. The mobile industry could also look at the re-planning of mobile spectrum bands to use them more efficiently and to adjust them as some earlier generation mobile services are retired. Many countries across Europe have also reported that mobile doesn't require additional spectrum.<sup>12</sup> A co-primary mobile allocation therefore presents significant risks to DTT, without any clear benefits.

In conclusion, DTT and PMSE are critical services in the UK and will continue to be so for decades into the future. Ofcom is correct in its assessment that a No Change decision on WRC-23 agenda item 1.5. would best serve the UK, and it is vital now that the conversation shifts to how this outcome will be secured. A co-primary mobile allocation would pose significant risks to the viability of the DTT platform and the UK maintaining absolute control in its use of spectrum to deliver DTT. Avoiding this outcome must be a high priority for the regulator.

We would welcome further engagement with Ofcom on WRC-23 in the lead-up to the conference.

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<sup>11</sup> Ofcom, 2022, *Mobile networks and spectrum: Meeting future demand for mobile data*, [https://www.ofcom.org.uk/data/assets/pdf\\_file/0017/232082/mobile-spectrum-demand-discussion-paper.pdf](https://www.ofcom.org.uk/data/assets/pdf_file/0017/232082/mobile-spectrum-demand-discussion-paper.pdf).

<sup>12</sup> Countries' responses to an ITU-R questionnaire on spectrum use and needs in the 470-960 MHz band prior to WRC-23 showed that mobile doesn't require additional spectrum. (Administrative Circular [CACE/963](#) on "Spectrum use and spectrum needs of the IMT applications/systems in mobile (except aeronautical mobile) service within the frequency band 470-960 MHz in Region 1). In contrast, a significant number of administrations identified the need to use the band for broadcasting – 95 countries said the spectrum is needed for broadcasting, compared to only seven indicating less of the spectrum was needed for this purpose (see ITU-R, 2021, *Report ITU-R BT.2302-1: Spectrum requirements for terrestrial television broadcasting in the UHF frequency band in Region 1 and the Islamic Republic of Iran*, <https://www.itu.int/pub/R-REP-BT.2302-1-2021>).

**About Arqiva**

Arqiva is a communications, infrastructure, and media services company at the heart of the broadcast and utilities sectors in the UK. We deliver the broadcast television and radio services relied on by millions of people across the country and provide satellite data and gateway services. We also provide machine-to-machine connectivity for smart metering within the energy and water sectors.

Our response to this Call for Input focuses primarily on WRC-23 agenda item 1.5, which concerns the future delivery of broadcast television in the UK using the 470-694 MHz spectrum band, as well as the operation of wireless equipment critical to content production and live events (programme-making and special events or ‘PMSE’ equipment). We provide comment on the Call for Input questions below.

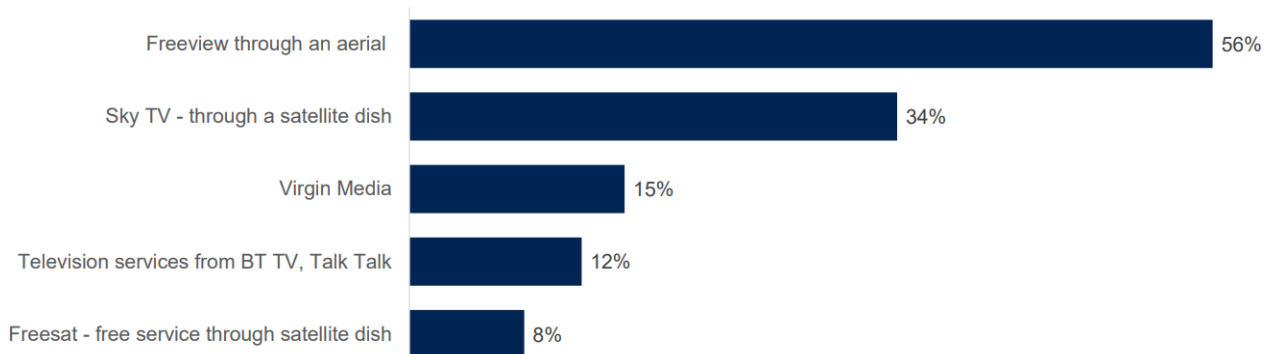
**Arqiva’s comments on Ofcom’s UK preparations for the World Radiocommunication Conference 2023 (WRC-23) – UK provisional views and position for WRC-23**

**Q1. Do you agree with the prioritisation of the agenda items, as shown in Annex 5, and if not why?**

We strongly agree with the ‘high’ prioritisation of WRC-23 agenda item 1.5. and agree that Ofcom must “actively engage at all stages” on this agenda item. While recognising that the WRC process is necessarily a negotiation, we are concerned that the UK’s position on ‘high priority’ items could be compromised if Ofcom does not take a strong stance to defend the desired outcome. A high priority designation should indicate that Ofcom will draw a red line on what is acceptable to the UK. ‘Medium’ and ‘low’ priority designations for agenda items would indicate greater scope for negotiation.

The ongoing delivery of DTT and PMSE in the UK are key policy issues. DTT is used by over 16 million households across the country.<sup>13</sup> It underpins the delivery of public service broadcasting, and the platform’s reach has attracted a diverse range of broadcasters, with recent additions to the platform including Sky Arts, GB News and TalkTV. The DTT service is also essential in the eyes of UK viewers. Research from Ipsos shows that a vast majority – 90% of adults in Great Britain – believe that broadcast services should continue to be supported. Ipsos further found that 85% believe the Government or their local MP should continue to actively support broadcast services.

**Figure 3: Traditional TV services used in the household in the past year**



Note: NB: Other services surveyed. Base: All respondents, GB adults, 18+, n=2005  
 Source: Ipsos research. [www.arqiva.com/Importance\\_of\\_Broadcast.pdf](http://www.arqiva.com/Importance_of_Broadcast.pdf).

<sup>13</sup> Ofcom, 2022, *Media Nations 2022: Interactive report*, <https://www.ofcom.org.uk/research-and-data/tv-radio-and-on-demand/media-nations-reports/media-nations-2022/media-nations-2022-interactive-report>.

For many, DTT complements streaming and other services,<sup>14</sup> providing greater choice. However, there are also many vulnerable individuals, and people less digitally connected, that are heavily reliant on DTT for TV services. This was highlighted in the Ipsos research, which found:

- Weekly DTT viewing peaks at two thirds (68%) of all people aged 75+, a group less likely to use streaming services. Nearly a fifth (18%) of people 65+ only watched Freeview via an aerial in the past year (i.e., they'd accessed no other TV services).
- One in ten (12%) adults in Great Britain have a skills gap meaning they face challenges accessing TV or radio online. This rises to 23% amongst those aged 55+ – a significant issue given the country's ageing population.<sup>15</sup>
- Across Great Britain, 7% of adults suggest their current internet connection is not good enough to be able to watch TV shows or listen to the radio online. This challenge was higher for those in the South West (11%) and those in rural areas (9% vs. 4% living in metropolitan areas).
- 13% of adults in Great Britain say they cannot afford paid-for TV services. The youngest, 18-24s, were more likely than the average (19% vs. 13% overall) to suggest that they cannot afford to pay for services that charge you each month to watch your favourite TV shows. One in five (21%) who are social grade DE suggest such payments are a barrier.

These findings are compounded by other recent research, including from Ofcom. Ofcom's 2022 Online Nation report highlights that 6% of the population is without internet access at home – amongst those 65+, this rises to 20% and amongst those 18+ with any impacting/limiting disability, this rises to 11%.<sup>16</sup> Many households also only rely on mobile internet, which is not a viable alternative for television viewing.<sup>17</sup>

For many, broadband and paid-for services are simply unaffordable. Ofcom's 2022 Affordability of Communications Services report finds that 5% of households, or about 1.1 million homes, struggle to afford their fixed broadband service.<sup>18</sup> There are also ongoing challenges in connecting rural and remote households in the UK. As highlighted by Openreach during a committee hearing, national full-fibre, gigabit-capable broadband would likely not be completed until the early 2030s.<sup>19</sup>

The above highlights that, in addition to greater reliance on IPTV being undesirable for many UK viewers, there would be significant risks and costs associated with eroding the DTT platform. There would be a need to ensure continued universal access and delivery of services across the country, including to households that have not had a broadband service before, currently in hard-to-reach locations, or are unable to afford broadband services. There is also a substantial issue to overcome with regard to a digital skills gap across

<sup>14</sup> Ipsos, June 2022, *The importance of Digital Terrestrial Television and Broadcast Radio*, [www.arqiva.com/Importance\\_of\\_Broadcast.pdf](http://www.arqiva.com/Importance_of_Broadcast.pdf). Two-fifths (41%) of adults in Great Britain who watch broadcast or subscription-based video-on-demand services in the past year also watch DTT on a weekly basis.

<sup>15</sup> The Office for National Statistics, 2022, *Population and household estimates, England and Wales: Census 2021*, <https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates/bulletins/populationandhouseholdestimatesenglandandwales/census2021>; The Office for National Statistics, 2022, *Population and household estimates, Wales: Census 2021*, <https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates/bulletins/populationandhouseholdestimateswales/census2021>.

<sup>16</sup> Ofcom, 2022, *Online Nation 2022 report*, <https://www.ofcom.org.uk/research-and-data/internet-and-on-demand-research/online-nation/interactive>.

<sup>17</sup> Ofcom, 22 July 2022, *Affordability of communications services: Summary of findings*, [https://www.ofcom.org.uk/data/assets/pdf\\_file/0015/222324/affordability-of-communications-services-summary.pdf](https://www.ofcom.org.uk/data/assets/pdf_file/0015/222324/affordability-of-communications-services-summary.pdf).

<sup>18</sup> Ofcom, 2022, *Affordability of Communications Services*, [https://www.ofcom.org.uk/data/assets/pdf\\_file/0016/232522/Affordability-of-Communications-Services.pdf](https://www.ofcom.org.uk/data/assets/pdf_file/0016/232522/Affordability-of-Communications-Services.pdf).

<sup>19</sup> House of Lords Communications and Digital Committee, 2022, *1st Report of Session 2022-23, Licence to change: BBC future funding*, <https://committees.parliament.uk/publications/23091/documents/169130/default/>.

the population and amongst elderly and vulnerable viewers in particular. Failure to grapple with these issues would mean that, should the DTT service deteriorate, these viewers would be left without access to TV providing public service broadcasting, news, information, entertainment, and connection to their community and the UK more broadly. The recent attempt by BT to move all customers from traditional copper landlines to internet-based systems is an example of the challenges that could be faced. Earlier this year, its Digital Voice rollout was suspended after many vulnerable customers were left without the ability to make phone calls during winter storms and power cuts.<sup>20</sup>

Additionally, there are infrastructure resilience issues to consider. The DTT network provides universal access to broadcast services. It provides assurance that, should mobile or broadband networks be unavailable, people are able to access trusted news and information. This is of high importance given the potential risks of disruption to services, such as through a cyber-attack on the UK's internet infrastructure.

These findings demonstrate why the outcome of WRC-23 agenda item 1.5 must be considered a 'high priority' by Ofcom. Safeguarding the ongoing delivery of DTT is essential for UK viewers. If it is not protected, there are risks that many UK viewers get left behind and are less well off than they are today with regard to their access to TV services.

[Q2-Q4 – No response]

**Q5. What are your views on the development of regulatory conditions to facilitate deployment of high altitude IMT base stations in IMT identified bands below 2.7 GHz?**

This agenda item may not appear relevant, at present, to the UK. However, given the possibility that mobile is given a co-primary allocation in the 470-694 MHz band, and the continued use of the band above 700 MHz for broadcast in some parts of the world, the use of high altitude IMT base stations (HIBS) could raise challenges. Any regulatory conditions developed for HIBS must not impede on broadcasting's use of spectrum below 1 GHz. In these bands interference can occur at distances beyond the radio horizon (>500 km), meaning that DTT reception may be subject to interference from the IMT downlink, and IMT uplink receivers may be subject to interference from DTT transmitting stations. Regulatory conditions should protect existing broadcast services and not unduly restrict new broadcast services, including 5G Broadcast.

**Q6. Do you agree that a formal modification to the Radio Regulations is not needed for fixed service applications that use IMT technologies?**

Arqiva strongly supports no change to the Radio Regulations under agenda item 9.1 topic c and encourages Ofcom to advocate for CEPT formally adopting a no change position on this item. At WRC-19, this topic was modified from dealing with a few specific bands to be more general, so that it can now apply to all fixed service bands. This broad-brush approach is unsupported by any compatibility studies. Further, as Ofcom highlights, IMT is currently one of many technologies that can be used for fixed services; changing the Radio Regulations would be potentially limiting.

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<sup>20</sup> As reported, for example, on [MailOnline](#) on 29 March 2022.



**Q7. What are your views on the proposed approach for 470-694 MHz, recognising the national decisions already in place and taken for DTT multiplex licensing in the band, and the additional and supplementary spectrum made available for UK PMSE usage?**

We welcome and agree with Ofcom's preliminary view that "No Change" would meet the UK's interests recognising our national usage of the band today."<sup>21</sup>

However, Ofcom indicates that it considers "greater flexibility" for other administrations around the use of this spectrum might be achievable through a co-primary mobile allocation, without significantly undermining the viability of the UK DTT platform.<sup>22</sup> Further, Ofcom appears to disregard the risk of interference or the UK facing pressure to change its use of the spectrum under a co-primary arrangement, while acknowledging that the UK's continued use of DTT would "limit the potential of several geographically close European countries from being able to deploy mobile broadband in the band".<sup>23</sup> This is highly concerning, and underrepresents the risks posed by a co-primary mobile allocation to the DTT platform and ensuring "any decision on the future use of this band in the UK rests with the UK authorities."<sup>24</sup> A co-primary allocation introduces uncertainty and risk to the DTT platform, without any clear benefit given that mobile does not require further spectrum to meet demand.

The DTT platform delivers highly valued broadcast services universally in the UK, and it is important that as much regulatory certainty as possible is provided to enable a thriving broadcast industry. As we set out in the Executive Summary at the start of our response, in order to enable the ongoing success of DTT and ensure that services can remain for millions of households, Ofcom needs to be a strong voice for "No Change" on WRC-23 agenda item 1.5.

Key arguments include:

***A co-primary mobile allocation would degrade confidence in the DTT platform, limiting investment and innovation. This would impact millions of UK viewers who rely on the service, including for access to public service broadcasting content.***

As highlighted in our response to Question 1 of this Call for Input, DTT is a critical service within the UK. It covers 98.5% of the population and is widely used, is integral to public service broadcasting, and a significant number of people depend on the service for affordable, reliable access to television. DTT is also a vital service across various European countries. Responses to an ITU-R questionnaire on broadcasting's use and needs have shown broad support for DTT continuing with its use of spectrum.<sup>25</sup>

DTT's spectrum arrangements have gone through an extended period of instability. Broadcasters have, since the 1990s, adopted digital technologies enabling a greater range of TV services with improved spectrum efficiency. Over the past 15 years, terrestrial television's spectrum has been reduced significantly, with the 700 MHz and 800 MHz bands being reallocated to mobile. The highly successful Freeview platform, providing public service broadcasting and access to a wide range of free-to-air channels, is now confined to the 470 to 694 MHz band. Any further reductions in spectrum would seriously risk the viability of the platform, potentially reducing services and coverage. With this context, a co-primary mobile allocation would signal that the future of the DTT platform is not guaranteed.

<sup>21</sup> Ofcom, 2022, *UK preparations for the World Radiocommunication Conference 2023 (WRC-23): UK provisional views and positions for WRC-23*, [https://www.ofcom.org.uk/data/assets/pdf\\_file/0025/239407/WRC-23\\_Call\\_for\\_Input.pdf](https://www.ofcom.org.uk/data/assets/pdf_file/0025/239407/WRC-23_Call_for_Input.pdf), paragraph 5.1.8.

<sup>22</sup> Ofcom, 2022, *UK preparations for the World Radiocommunication Conference 2023 (WRC-23): UK provisional views and positions for WRC-23*, [https://www.ofcom.org.uk/data/assets/pdf\\_file/0025/239407/WRC-23\\_Call\\_for\\_Input.pdf](https://www.ofcom.org.uk/data/assets/pdf_file/0025/239407/WRC-23_Call_for_Input.pdf), paragraph 5.1.9.

<sup>23</sup> Ofcom, 2022, *UK preparations for the World Radiocommunication Conference 2023 (WRC-23): UK provisional views and positions for WRC-23*, [https://www.ofcom.org.uk/data/assets/pdf\\_file/0025/239407/WRC-23\\_Call\\_for\\_Input.pdf](https://www.ofcom.org.uk/data/assets/pdf_file/0025/239407/WRC-23_Call_for_Input.pdf), paragraph 5.1.11.

<sup>24</sup> Ofcom, 2022, *UK preparations for the World Radiocommunication Conference 2023 (WRC-23): UK provisional views and positions for WRC-23*, [https://www.ofcom.org.uk/data/assets/pdf\\_file/0025/239407/WRC-23\\_Call\\_for\\_Input.pdf](https://www.ofcom.org.uk/data/assets/pdf_file/0025/239407/WRC-23_Call_for_Input.pdf), paragraph 5.1.9.

<sup>25</sup> ITU-R, 2021, *Report ITU-R BT.2302-1: Spectrum requirements for terrestrial television broadcasting in the UHF frequency band in Region 1 and the Islamic Republic of Iran*, <https://www.itu.int/pub/R-REP-BT.2302-1-2021>.

Further, a co-primary mobile allocation being accepted by Ofcom would generate uncertainty as it would appear to be a step away from Government's support for DTT. The Government has recently extended DTT multiplex licences until 2034. A No Change decision at WRC-23 aligns with the Government's continued support for DTT into the future. In comparison, a co-primary mobile allocation would appear disjointed from that decision, generating uncertainty on DTT's spectrum arrangements over the long-term. In addition, Ofcom has been asked to review market changes in content distribution by 2025. Ofcom should not be enabling changes to spectrum arrangements that would undermine DTT when a national debate about the shape of the UK's future content distribution market has not even begun.

The uncertainty brought by a co-primary mobile allocation would impact the decision-making of all market players involved in the DTT ecosystem. DTT currently involves a wide range of organisations including equipment manufacturers, broadcasters and content providers, and retailers. Should a co-primary mobile allocation be agreed, this could impact investment across the market, including in: TV sets and operating systems that provide access to, and promote the visibility of, live linear TV; content delivery to audiences by broadcasters through DTT; and investment in the DTT network infrastructure, for example investment in more HD channel capacity or in making the network more energy and carbon efficient. Investments in the platform require long-term security, due to the long service lives and payback periods of infrastructure and equipment.

Ultimately, this would affect UK viewers. Reduced investment in the DTT ecosystem would be likely to impact the diversity and quality of content delivered on the platform, and the accessibility and visibility of DTT services on TVs. As highlighted in this response, millions of people continue to rely on DTT; in particular, the elderly, lower-income households, and those in rural areas. The deterioration of the content or functionality of the DTT platform would have a significant impact on these viewers.

In addition, deterioration of the DTT platform could have significant knock-on effects to the broadcast radio industry. DTT operates through a network shared with broadcast radio. The broadcasting network in the UK would need to continue operating irrespective of the number of multiplexes, with the overall network structure and operations, monitoring and maintenance all still being required. In the event that Ofcom's approach to UHF spectrum leads to the closure of DTT services, this can be expected to have an impact on the radio sector which will continue to rely on the infrastructure it currently shares with DTT. Ultimately, this could impact the viability of broadcast radio in the UK over the long-term and should be avoided by delivering a No Change position on UHF spectrum at WRC-23.

These risks to the broadcast market and to viewers and listeners do not appear to have been assessed by Ofcom. It is important that these risks are fully understood to ensure that the delivery of broadcast TV and radio is safeguarded in the UK for the long-term.

### ***The risks of a co-primary mobile allocation on the UK's control over its airwaves***

Ofcom's Call for Input outlines that other administrations will argue for a co-primary allocation on the grounds that this would provide "greater flexibility" for how the band is used.<sup>26</sup> A co-primary mobile allocation does not provide countries with absolute flexibility, due to the realities of sharing spectrum between broadcast and mobile services. These services cannot share the same spectrum unless separated by significant distances. This means that neighbouring countries using the spectrum differently, for either DTT or mobile, would risk harmful interference to services. The need to harmonise spectrum use and prevent interference introduces the risk of the UK facing pressure to change how it uses the spectrum band to accommodate other nations if a co-primary mobile allocation is adopted.

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<sup>26</sup> Ofcom, 2022, *UK preparations for the World Radiocommunication Conference 2023 (WRC-23): UK provisional views and positions for WRC-23*, [https://www.ofcom.org.uk/data/assets/pdf\\_file/0025/239407/WRC-23\\_Call\\_for\\_Input.pdf](https://www.ofcom.org.uk/data/assets/pdf_file/0025/239407/WRC-23_Call_for_Input.pdf), paragraph 5.1.9.

Various real-life experiences and technical studies have demonstrated that it is impractical for broadcast and mobile to share spectrum. For example, during the clearance of DTT from the 700 MHz and 800 MHz bands interference occurred despite best efforts to avoid it. As highlighted by an ITU-R report on the 700 MHz and 800 MHz clearances, “with propagation conditions favourable to UHF frequencies, like a path above a warm sea, DTT transmitters can be a source of LTE performance degradation over great distances: several hundreds of kilometres, as reported by Saudi Arabia (300 km, mixed path), EBU regarding Cyprus (540 km, warm sea path) and France (260 km, warm sea path)...This type of interference can only be resolved by stopping one of two services.”<sup>27</sup> Further, a 2022 report from the Radio Spectrum Policy Group (RSPG) detailed how DTT services in Italy caused harmful interference to Slovenian and Croatian IMT systems during the clearance of DTT from 700 MHz.<sup>28</sup>

Ofcom highlights the risk of DTT interfering with mobile services using the same band, outlining that the UK’s continued use of DTT “could limit the potential of several geographically close European countries from being able to deploy mobile broadband in the band”.<sup>29</sup> The impact of the UK continuing to use DTT on the ability of neighbouring countries to introduce mobile services should not be understated. Existing UK DTT will make it impractical to introduce mobile in the Netherlands, Belgium, Ireland and much of Northern France, particularly in areas bordering the English Channel. It should also be acknowledged that if mobile services were implemented in these countries, they could cause interference to UK DTT (see Annex for further information).

The interference risks between DTT and mobile services would mean that the UK could expect to face international pressure to change its use of spectrum to accommodate its neighbours. The UK’s compliance with the Radio Regulations should there be a co-primary outcome does not mitigate this risk. Given Ofcom’s priority to ensure “any decision on the future use of this band in the UK rests with the UK authorities”, it should strongly advocate for a No Change decision in the lead-up to and during WRC-23.

### ***Safeguarding spectrum for programme-making and special events***

A co-primary mobile allocation would also pose a significant threat to the UK’s entertainment and live events industry. For many years, DTT has shared spectrum with programme-making and special events (PMSE) wireless technologies. These technologies are critical to TV and film productions, theatre production, live events, and broadcasts of events that bring the country together – Glastonbury, the F1 at Silverstone, the Commonwealth Games, football, and cricket among them. PMSE is unable to share spectrum with mobile services and as a result, a mobile allocation would threaten the ability for PMSE to operate at all.

It is unclear how sufficient spectrum for PMSE would be provided if mobile was allocated to the 470-694 MHz band. Ofcom has identified that the aeronautical band, 960-1164 MHz, may also be made available to PMSE but due to demand, this band would add to rather than replace PMSE’s usage of the UHF band, 470-694 MHz. If PMSE were to lose access to the UHF band, there would be serious risks to PMSE and it could undermine the UK’s booming production sector.

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<sup>27</sup> ITU-R, 2021, *National field reports on the introduction of IMT in the bands with co-primary allocation to the broadcasting and the mobile services*, <https://www.itu.int/pub/R-REP-BT.2301-3-2021>.

<sup>28</sup> Radio Spectrum Policy Group, 2022, *Progress Report of the RSPG Sub-Group on “Good offices” to assist in bilateral negotiations between Member States*, [https://rspg-spectrum.eu/wp-content/uploads/2022/02/RSPG22-004final-progress\\_report\\_good\\_offices.pdf](https://rspg-spectrum.eu/wp-content/uploads/2022/02/RSPG22-004final-progress_report_good_offices.pdf)

<sup>29</sup> Ofcom, 2022, *UK preparations for the World Radiocommunication Conference 2023 (WRC-23): UK provisional views and positions for WRC-23*, [https://www.ofcom.org.uk/data/assets/pdf\\_file/0025/239407/WRC-23\\_Call\\_for\\_Input.pdf](https://www.ofcom.org.uk/data/assets/pdf_file/0025/239407/WRC-23_Call_for_Input.pdf), paragraph 5.1.11.

***There is no credible demand for broadcasting spectrum to be used for mobile***

The argument for additional low-band spectrum for mobile has been framed as a route to improve capacity in rural areas. This argument is flawed. If the 266 MHz<sup>30</sup> of low-band spectrum currently available to mobile is insufficient to meet demand, that area would be a 'hot spot' and in this case, it warrants the use of mid band spectrum. Mid and high band spectrum provide greater capacity by allowing access to greater bandwidth, MIMO, active antenna systems and other features of 5G.

Further, if existing low band spectrum doesn't provide sufficient coverage and hence capacity in rural areas, further low band spectrum is not an efficient means of addressing this issue. This would be better resolved through investment in required infrastructure. In some instances, the business case for investing in infrastructure in rural areas is not justified. This is a recognised problem, and there are programmes of work underway internationally to support better rural mobile coverage. In the UK, the government announced in March 2020 that it had agreed to a £1 billion deal with the four mobile network operators to deliver the Shared Rural Network, which aims to deliver 4G coverage to 95% of the UK.<sup>31</sup>

Crucial to this debate is that mobile already has the spectrum resourcing it needs to meet demand through to at least 2030. This was reflected in Ofcom's discussion paper on future demand for mobile spectrum, which found that, "existing mobile spectrum holdings and spectrum already planned for release are likely to be broadly sufficient to meet future demand to 2030".<sup>32</sup> Responses to an ITU-R questionnaire on spectrum use and needs of IMT applications and mobile systems in the 470-960 MHz band further evidences that the majority of countries in Region 1 do not require additional spectrum for mobile.<sup>33</sup> Complementing this, responses to an ITU-R questionnaire on broadcasting's use and needs in the band found that, of the 106 responses received, 95 countries (about 90% of responses) indicated they need the band for broadcasting.<sup>34</sup>

Mobile's spectrum allocation has increased substantially over the past 15 years, and there is significant opportunity for this spectrum to be used more efficiently. Upgrading to the newest and most spectrally efficient technologies, deploying current spectrum holdings more widely and network densification would enable mobile to increase capacity and meet demand for services. Replanning of the spectrum bands used by mobile could release further spectrum particularly as earlier generations of mobile networks are retired.

Currently, mobile with IMT identification has 306 MHz of sub 1 GHz UHF spectrum<sup>35</sup>, of which only 210 MHz is used for mobile phones. The remaining 96 MHz are guard bands and unused, having been allocated to supplementary down-link (SDL) or in a small number of countries, PPDR (16 MHz). In some parts of the spectrum unused by mobile, other systems have utilised this resource, including short range devices (SRD) and GSM-R. Despite these technologies filling some of the gaps, there is still significant scope for mobile to make better use of its spectrum. For example, the 20 MHz assigned to SDL in the 700 MHz band is currently unused. Assigning the 20 MHz of spectrum to SDL limits the opportunity of using the 2 x 5 MHz and 2 x 3 MHz FDD bands.

Mobile's capacity in the sub 1 GHz bands would also be increased significantly through using the latest technologies. Currently, mobile uses a mix of dated and obsolete 2G and 3G systems, which will be transitioned to 5G by 2033. This will mean that mobile's sub 1 GHz mobile broadband capacity will effectively

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<sup>30</sup> Between 694-960 MHz.

<sup>31</sup> Department for Digital, Culture, Media & Sport, 2021, *Government breakthrough on £500 million support package to boost rural mobile coverage*, <https://www.gov.uk/government/news/government-breakthrough-on-500-million-support-package-to-boost-rural-mobile-coverage--2#:~:text=The%20government%20announced%20on%209,new%20and%20existing%20phone%20masts>.

<sup>32</sup> Ofcom, 2022, *Mobile networks and spectrum: Meeting future demand for mobile data*, [https://www.ofcom.org.uk/data/assets/pdf\\_file/0017/232082/mobile-spectrum-demand-discussion-paper.pdf](https://www.ofcom.org.uk/data/assets/pdf_file/0017/232082/mobile-spectrum-demand-discussion-paper.pdf).

<sup>33</sup> ITU-R Working Party 5D issued a questionnaire in Administrative Circular *CACE/963*. Only 20 countries, out of the 121 in Region 1, responded to the survey at all, and of these only 8 indicated a requirement for additional spectrum for mobile.

<sup>34</sup> ITU-R, 2021, *Report ITU-R BT.2302-1: Spectrum requirements for terrestrial television broadcasting in the UHF frequency band in Region 1 and the Islamic Republic of Iran*, <https://www.itu.int/pub/R-REP-BT.2302-1-2021>.

<sup>35</sup> 694 – 960 MHz, 410 – 430 MHz, 450 – 470 MHz.

triple between 2021 and 2033.<sup>36</sup> There will also be a significant increase in mobile's mid-band broadband spectrum, with mid-band 2G and 3G services using 1800 MHz and 2100 MHz spectrum also set to migrate to 5G by 2033.<sup>37</sup> Further, future technology could improve the amount of bandwidth occupied. Greater focus should be given to applying new technologies to increase spectral efficiency.

Given there is no identified need for additional mobile spectrum, a co-primary mobile arrangement poses substantial risks without benefits. Mobile should be incentivised to use its spectrum more efficiently in the years ahead, rather than using additional spectrum when this is not needed and where this would impact critical services like DTT and PMSE. The UK should continue to safeguard the current spectrum regulatory arrangements by actively seeking a No Change decision at WRC-23.

### ***The environmental impacts of degrading the DTT platform***

TV delivery via DTT is far more energy and carbon efficient than via broadband. A recent EU study has found that DTT generates just 4.2g of CO<sub>2</sub> per device viewing hour, while over-the-top media services delivered via the internet (OTT) generates about four times more (16.3g) and IPTV networks generate about five times more (21g) per viewing hour.<sup>38</sup>

It is important for all sectors to move towards net zero, including the UK media sector. The need to address environmental impacts is also reflected in ITU-R Resolution 60<sup>39</sup>, as well as the CEPT Brief on agenda item 1.5 which states “with concern growing about greenhouse gas emissions and it being an obligation on most companies and administrations to consider the environmental impact of their work, any review of spectrum use and needs should also consider the environmental impact.”<sup>40</sup>

Pressure on the DTT platform, and on consumers to rely more heavily on online TV services, would have an environmental impact. It is important that this impact and how it could be mitigated is considered more deeply. Further, a co-primary mobile allocation could reduce the incentive for potential investment in the platform to make DTT ‘greener’ still; potentially impacting any business case for moving to the latest and most energy efficient transmitters, which have a long working life and payback period.<sup>41</sup>

### ***Ofcom must advocate strongly for a No Change decision from now through to, and during, the WRC-23 conference***

Ofcom has correctly identified that a No Change decision on WRC-23 agenda item 1.5 would meet the UK's interests. It is essential that the regulator does not take it for granted that this will be the outcome reached by all parties in the region. Arqiva believes that Ofcom should strongly advocate a No Change position at international meetings, and it should engage with international administrations to support their decision-making so that this outcome is delivered.

One such group that the UK must seek to influence are the parties within the European Conference of Postal and Telecommunications Administrations (CEPT). This includes 46 members countries, and many are yet undecided or may change their position on agenda item 1.5. It is also important to note that CEPT's

<sup>36</sup> The 700 MHz network will be rolled out, and the 900 MHz band transitioning from 2G.

<sup>37</sup> This increase in spectrum will be accompanied by an even greater increase in capacity as mid-band 5G services can take advantage of enhanced MIMO and AAS. Mobile mid-band spectrum allocated to 4G/5G services further includes 2600 MHz and the new 3.6 GHz band (2021).

<sup>38</sup> Camstone, 2021, *Quantitative study of the GHG emissions of delivering TV content*, [https://thelocatproject.org/wp-content/uploads/2021/11/LoCaT-Final\\_Report-v1.2-Annex-B.pdf](https://thelocatproject.org/wp-content/uploads/2021/11/LoCaT-Final_Report-v1.2-Annex-B.pdf).

<sup>39</sup> ITU, Resolution ITU-R 60-2 Reduction of energy consumption for environmental protection and mitigating climate change by use of ICT/radiocommunication technologies and systems, [https://www.itu.int/dms\\_pub/itu-r/opb/res/R-RES-R.60-2-2019-PDF-E.pdf](https://www.itu.int/dms_pub/itu-r/opb/res/R-RES-R.60-2-2019-PDF-E.pdf)

<sup>40</sup> CEPT PTD-6, 2022, *Draft CEPT Brief on WRC-23 agenda item 1.5*, [https://cept.org/Documents/cpg-ptd/70681/ptd-22-026-annex-iv-05\\_draft-cept-brief-on-wrc-23-agenda-item-15](https://cept.org/Documents/cpg-ptd/70681/ptd-22-026-annex-iv-05_draft-cept-brief-on-wrc-23-agenda-item-15).

<sup>41</sup> Investment in major capital equipment, for example broadcast transmitters, would typically require at least 10 -15 years to recover the initial investment. Arqiva and broadcasters needs a long period of stability and certainty from Ofcom and the Government so that sensible investments which can support the move to Net Zero can be considered.

proposals at WRC-23 will be influenced by the European Commission – any decisions that the Commission takes are binding on EU Member States, who then vote as a bloc in CEPT. The UK must take a leadership role in international discussions to highlight the importance of a No Change outcome on agenda item 1.5.

We consider it highly important that Ofcom communicates its support for a No Change outcome clearly and without caveats. Given how vital these services are to the UK, Ofcom should not be indicating it is open to other arrangements that are untenable without undermining the delivery of DTT and PMSE. Instead, Ofcom should highlight that it is seeking a No Change decision and work with international administrations to come to an agreement on this outcome.

**Question 8: What are your views on the need to establish an international regulatory environment that provides adequate protection of UK fixed links from earth stations in motion, in the band 12.75 – 13.25 GHz, which is also practicable from an enforcement/implementation perspective?**

We consider it important that UK fixed links continue to be protected.

**Question 9: Do you agree that the UK continues to support the maritime distance figure for ESIMs that work to non-geostationary satellites and to test the other conditions agreed at WRC19 for ESIMs working to geostationary satellites to ascertain whether these remain appropriate for non-geostationary satellites?**

We agree with Ofcom's position, noting the importance of protecting terrestrial use.

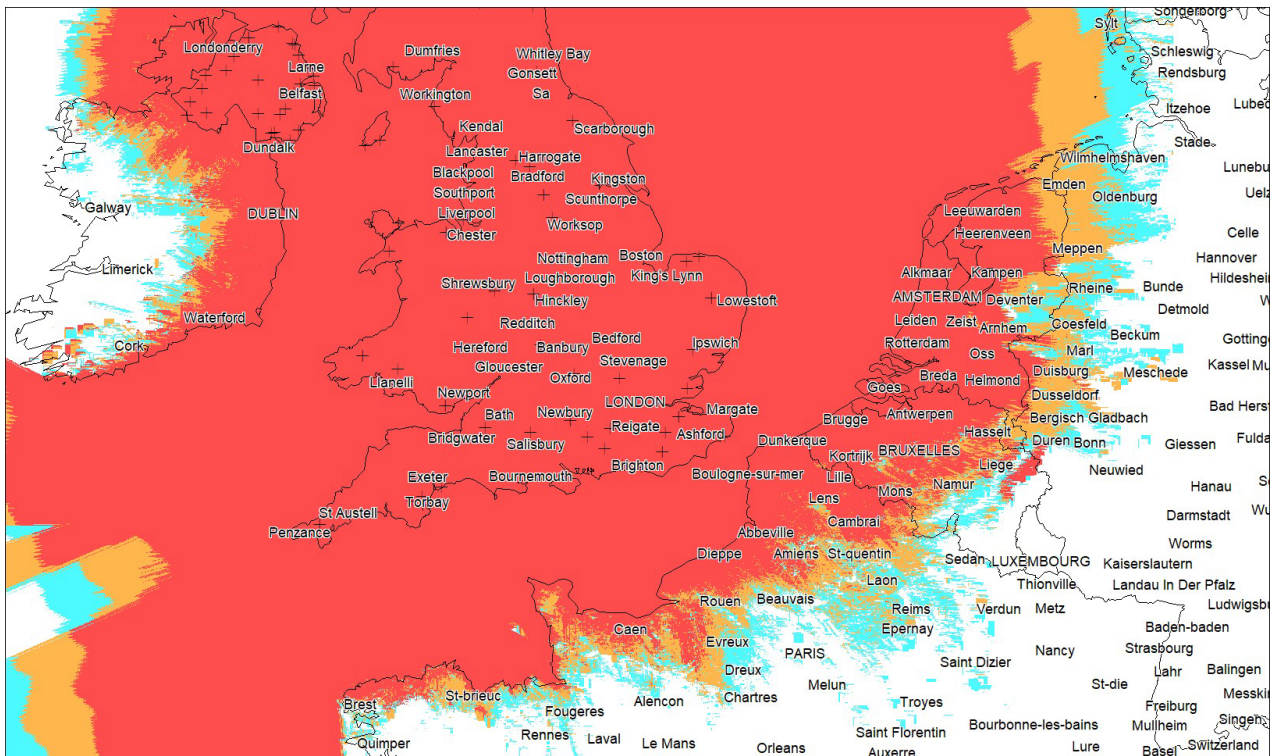
**[Q10-Q33 – No response]**

**Annex: Impact of UK DTT on possible mobile services in Europe**

Various studies carried out in CEPT and ITU study groups have shown that spectrum sharing between mobile and broadcasting isn't possible. These studies are further supported by many practical examples of cases of interference that occurred during the clearance of broadcasting from the 700 MHz and 800 MHz bands.

Ofcom acknowledges that DTT "could limit the potential of several geographically close European countries from being able to deploy mobile broadband in the band".<sup>42</sup> The impact of the UK continuing to use DTT on the ability of neighbouring countries to introduce mobile services should not be understated. An assessment of interference from UK DTT to mobile services in adjacent countries shows it will be impractical to introduce mobile in the Netherlands, Belgium, Ireland and much of Northern France, particularly in areas bordering the English Channel, whilst UK DTT is operating, see chart below. As such, it can be expected that pressure will be applied on the UK to close its DTT service and to allow use of the spectrum for mobile applications.

**UK DTT interference to mobile in the 600 MHz band**



- 22dBµV/m Relaxation
- 16dBµV/m IMT
- 12dBµV/m PPDR

The signal levels shown in the chart are equivalent to an I/N = -10 dB for PPDR services, I/N = -6 dB for IMT services, the standard criterion used to protect such services, and a relaxed interference criterion of I/N = 0 dB for IMT. They have been calculated using ITU-R P.1812 at a height of 30m for 50% locations and at 10% time. The level shown is that of the strongest signal (not a power sum) from existing UK DTT

<sup>42</sup> Ofcom, 2022, UK preparations for the World Radiocommunication Conference 2023 (WRC-23): UK provisional views and positions for WRC-23, [https://www.ofcom.org.uk/data/assets/pdf\\_file/0025/239407/WRC-23\\_Call\\_for\\_Input.pdf](https://www.ofcom.org.uk/data/assets/pdf_file/0025/239407/WRC-23_Call_for_Input.pdf), paragraph 5.1.11.

transmitters operating on channels 45, 46, 47 and 48. These DTT channels being the ones that would interfere with IMT uplink if operated using the 600 MHz band (B71). Whilst some mitigation could be applied at the IMT base station by tilting or rotating the IMT base station antenna, the level of predicted interference is such that the scope for mitigation is limited.