

# Arqiva Submission: Ofcom Call For Input – ‘Review of the Use of Fixed Wireless Links and Spectrum Implications’

Arqiva welcomes the opportunity to respond to the Ofcom Call For Input on its Review of Fixed Wireless Links and Spectrum Implications.

Arqiva is a communications, infrastructure and media services company at the heart of the broadcast and utilities sectors in the UK. We deliver broadcast television and radio services nationally and provide satellite data and gateway services. We also provide machine-to-machine connectivity for smart metering and other utilities communications requirements within the energy and water sectors.

Set out below is our response to the call for input questions.

## **Background – Arqiva use of fixed wireless links across multiple spectrum bands**

Arqiva has a number of fixed wireless links licensed by Ofcom across a range of spectrum bands. Currently these comprise 589 licences used across 540 SHF different link paths. These are primarily used for the distribution and monitoring of broadcast transmission services to transmitting stations that provide digital terrestrial television along with analogue and DAB radio services for broadcasters to the public. As such, these services have a constant traffic load and are used to provide services with very high performance and availability expectations to large numbers of viewers and listeners.

Any interruption to service will result in a real-time impact on the service provided. This is different to many mobile broadband services that have buffering and re-send capabilities to manage periodic service interruptions.

The networks using the fixed wireless links have been designed to achieve the contracted performance levels based on technical parameters agreed with Ofcom for the use of the particular licensed frequencies for the sites involved. This includes Arqiva recently refreshing the commercial contracts for these links and investing for the next decade or more.

## **Response to Call for Input questions**

### ***Question 1***

*Please provide a description of your current use of fixed links (or indicate which of the use types in Table 3.1 best describe your use type).*

Arqiva uses fixed links primarily for the connectivity required for the terrestrial broadcasting of Digital Terrestrial Television, DTT), and both analogue and digital radio services. Along with this a

limited amount of link capacity on the same links is also used for the monitoring of national networks and the related telemetry and remote control of these services as well as other services such as closed circuit television monitoring services and corporate data communications.

## **Question 2**

*What are the factors driving your choice of fixed links over alternative connectivity solutions, and which factors have the biggest impact on your decisions? Is this likely to change in the next 5 years? If so, what do you expect will change?*

In the main, fixed wireless link licences are held by Arqiva to allow it to provide communications services between Arqiva owned or leasehold sites. By doing this, Arqiva can invest in long-term network solutions and not have to pay another communications network provider, such as BT, for the annual charges for a circuit in perpetuity.

Arqiva will periodically review the networks that it operates across the sites that it owns and has access to, so as to ensure that it can continue to provide an economic solution for the managed services that it provides to broadcast customers as well as to itself.

The major broadcast networks are contracted to deliver their existing services for periods longer than the next 5 years and so Arqiva does not expect the existing use of networks via fixed wireless links to change in the next 5 years. If Arqiva achieves additional customers for its managed services, it will consider additional connectivity appropriate to the additional service to be provided at that time.

## **Question 3**

*Is the current spectrum available for fixed links in the UK suitable and sufficient for your needs? If not, what would you change and why? If you believe changes are required, please give specific examples and reasons along with supporting evidence if available.*

Arqiva does not currently see significant issues with obtaining spectrum for fixed wireless links. We are however concerned that there will be challenges in finding suitable channels for our long-distance fixed wireless links in future if the Upper 6GHz band is withdrawn. We rely on these for link connections in several parts of the UK.

We have previously provided feedback on this concern in our response to the recent Ofcom consultation on Hybrid sharing: enabling both licensed mobile and Wi-Fi users to access the upper 6 GHz band.

Arqiva is keen that Ofcom can ensure that incumbent use of the upper 6GHz spectrum band is protected and the opportunity to use these links in future is still available.

[https://www.ofcom.org.uk/\\_data/assets/pdf\\_file/0034/269566/Arqiva.pdf](https://www.ofcom.org.uk/_data/assets/pdf_file/0034/269566/Arqiva.pdf)

We appreciate that further studies are being considered and would ask Ofcom to ensure that the spectrum to allow capacity for existing licences is protected.

#### **Question 4**

*Is there anything about Ofcom's current framework for authorising fixed links which you consider could be improved?*

Arqiva is generally happy with the framework for authorising fixed wireless links, however we would appreciate it if an efficient and timely means of finding out the high-low status of the links on an existing or future site licensed by Ofcom could be provided.

A few years ago, this was available in Excel format from Ofcom. We understand that this facility has since been withdrawn. We would find it useful if this can be reinstated, or an equivalent system provided, to deliver this functionality to spectrum users in planning their network changes.

#### **Question 5**

*How has your use of fixed links changed between 2016 and now? Please provide information on:*

- *Reasons for increase or decrease in the number of your links since 2016;*
- *Changes in the capacity of your links since 2016, including how you have; delivered this capacity change, e.g., different channel bandwidths, different link technology (please specify), etc.*

Since 2020, Arqiva has reviewed and refreshed parts of our fixed wireless links network as part of a review of our ongoing customer network needs and the economic viability of the networks. As part of this, Arqiva has been able to rationalise the number of links required and a number of licences have been surrendered to Ofcom at the end of this process. The programme of work is still an ongoing process with some further reductions envisaged as work is completed on sites within the next two years.

As part of enabling the network improvements since 2020, Arqiva has re-engineered existing links into larger channel sizes whilst at the same time, also operated some links at higher modulation modes to provide increased throughput.

For example, licence 0990953 [23GHz/14MHz Channel] between two sites in Cumbria was replaced by 1274249 [23GHz/28MHz] to provide an increased throughput for a new customer which was not achievable by an increase in modulation. At the same time, licence 1153723 between two sites in the west of England had an increase in modulation from 32QAM to 64QAM to provide additional capacity.

Changes such as these are made on an ad hoc basis across the network rather than as programme of the same capacity changes across the whole network.

The number of fixed wireless link licences held by Arqiva in 2020 was 740.

The number of licences held by Arqiva at the end of 2023 was 589.

As a result of these changes, Arqiva has achieved almost a 20% reduction in the number of links required in the last three years.

## **Question 6**

*How do you expect your usage to change over the next 5-10 years? Please provide information on:*

- *any increase/decrease in the number of links (by band) and bandwidth expected;*
- *likely changes in geographic distribution of links;*
- *likely changes in distribution of links by frequency band;*
- *likely changes in capacity of links and how you expect to deliver this capacity;*
- *other changes not covered above.*

As part of the ongoing programme of network review outlined in the response to question 5, we expect further reductions in the number of fixed wireless links operated by Arqiva to decrease by approximately 18%. When completed, this will reduce the number of licences held by Arqiva by another 107 licences.

Reductions are expected to be seen primarily in Scotland, with some others spread around the United Kingdom.

Cessations will be primarily in the 7.5GHz (28 licences) and 6GHz (42 licences) bands with the remaining 37 licences spread across the remaining bands

Apart from these, no further changes are currently expected, nonetheless, as other customer requirements are developed and contracted for, there may be additional requirements in this period that are particular to the relevant customers.

## **Question 7**

*Which of the developments listed above are expected to have the biggest impact on your use of fixed links? Are there other developments to be aware of that have not been listed? Please explain the reasons for your answer.*

For the broadcast network that Arqiva operates, for both digital terrestrial television and both analogue and digital radio, the networks of transmission sites and broadcast services have been very stable following the completion of the local commercial digital radio multiplexes by 2016. After this date, Arqiva has been looking at the economic viability of the fixed wireless links that it operates, as explained in the response to questions 5 and 6. This position reflects the investment that Arqiva has already made in its fixed wireless links.

Given the remote location of many transmitter sites away from fibre points of presence and the possible issues involved to provide wayleaves for fibre to remote sites, it has also not been an attractive option to use fibre at many sites. It should be noted that for broadcast networks there is no change in the capacity of the signals being delivered corresponding with the number of viewers or listeners to the programme content from the broadcasters.

### **Question 7a**

*Are you considering using NGSO satellites to provide backhaul for your network? If so, please provides details of the capacity requirements/expectations and the locations where delivery of this type of backhaul would be likely.*

Arqiva is not considering the use of NGSO satellites to provide backhaul or any other communications for broadcast customers.

Arqiva is the provider of NGSO network gateway services on a number of its sites but does not see this technology as appropriate for critical infrastructure services with continuous bandwidth demand such as broadcast television and radio services.

### **Question 8**

*If you already use alternative transport options for delivering your services, please:*

- *Provide an indication of the proportion of your services delivered over fixed links vs each alternative that you currently use. Is this proportion likely to change over the next 5-10 years? Is so please provide details;*
- *Explain how your business rationale for use of fixed links vs alternative connectivity solutions is changing over time;*
- *If possible, provide examples of your decision-making process for recently deployed connections.*

Arqiva looks to use the technology and related spectrum appropriate to the provision of the services for the customers that it contracts with. This results in a number of bespoke network configurations across the UK. For broadcast networks the most efficient means to distribute services is by re-broadcast link whereby a relay site receives the broadcast signals from another

site that is broadcasting the services required. These signals can then be converted to a new frequency and broadcast from the relay site again. This can be done for multiple sites in a broadcast chain. There are limitations on this approach potentially either from spectrum management, editorial content or geographic and terrain limits in delivering the signal.

As stated in the response to Question 7, Arqiva does not envisage any material changes in the numbers of broadcast transmission sites for television and radio in the next 5-10 years.

Also as stated in the responses to Questions 5 and 6, Arqiva will periodically review the economic viability of the networks. In addition, Arqiva will continue to consider the resilience of its networks where they are considered to be supporting critical national infrastructure services.

Some changes have been driven by the requirement to access a broadcast transmission site by fixed link no longer being needed.

For one customer the network to support their services previously had 59 links. 25 links have been replaced by fibre provision as BT now have more fibre access at Arqiva's transmission sites. Arqiva has invested in dark fibre solutions in some locations and these connections have replaced the need for fixed wireless links. These major network changes have been completed recently and no further changes are currently envisaged in the next 5-10 years.

## **Question 9**

*Which of the listed technologies are you already using or do you plan to use in the future? For each that you are using/plan to use, please explain:*

*the current extent of your use, whether you expect to expand or shrink your use over the next 5-10 years, and how availability of these capabilities might impact your choice to deploy fixed links vs an alternative.*

*Estimates of numbers or percentage of links deployed with each capability now and in the future would be valuable. We are particularly interested in feedback on future use of BCA.*

Arqiva already takes advantage of the infrastructure savings available from the use of Co-Channel Dual Polar (CCDP) technology where this is available for a number of links.

Across the Arqiva fixed link networks, 34 links currently operate with CCDP technology.

Due to the limited distance for any licensed links using the Band Carrier Aggregation, (BCA), technology this is not one used by Arqiva. Similarly, because Arqiva uses links for a fixed capacity requirement on each link, we do not use Adaptive Coding and Modulation, (ACM). Arqiva does not use either Integrated Access Backhaul, IAB, or technologies moving to higher bands above 90GHz.

## **Question 9a**

*If you plan to use BCA would you plan to use this primarily for new links, upgrades to existing links or a mix? What factors affect your decision to deploy (or not deploy) BCA today? Please provide whatever detail you can.*

Arqiva generally does not currently use the BCA technology due to the limited distance over which it can operate reliably.

## **Question 10**

*Do you have a need for W and D bands for fixed links use (or alternative uses)? If so, in what timescale?*

*Please provide further details, including any evidence you have to support your response.*

Arqiva does not use these bands for fixed links use due to the limited distance over which they can operate reliably.

## **Question 11**

*Do you expect to apply for new fixed links in the upper 6 GHz band in the future, and if so, in which geographical areas? What are the reasons for choosing this band over other available bands or alternative technologies? Is there a technical reason why you would choose the upper 6 GHz band?*

Arqiva has recently applied for a number of licences in the upper 6GHz spectrum band as part of its network review and recent contract updates.

Arqiva sees this spectrum as particularly useful for long-haul communications. In updating the current networks, Arqiva has been able to replace a number of previous links with a smaller number of suitable links in the upper 6GHz spectrum and thereby reduce the necessary installation and ongoing operating costs.

There are no other requirements for additional links in this spectrum that Arqiva is expecting to apply for in the next few years.

## **Question 12**

*Are there other international developments that you are aware of that could affect availability and utility of fixed links in the next 5-10 years?*



As well as the concerns expressed earlier for the upper 6GHz spectrum band, Arqiva would be particularly concerned if there were to be any changes proposed to the remaining fixed wireless link bands that are currently in operation. These would include those in the 7GHz and 23GHz bands. Any change of use for these bands would be a very significant detriment to Arqiva and the customers' networks that it operates across the UK.





## About Arqiva

Arqiva is at the heart of the broadcast and utilities sectors in the UK and beyond, providing critical communications infrastructure and media services. Arqiva is the only national provider of terrestrial television and radio broadcasting and provides a machine-to-machine connectivity network for smart metering and other uses within the utilities sector.

Arqiva's history can be traced back to 1922 when it broadcast the world's first national radio service. In 1936 it carried the BBC's first television broadcast. In 1978 it enabled Europe's first satellite TV test. By the 1990s Arqiva was working with the UK's mobile operators to bring mobile telecommunications to UK businesses and consumers. In this decade we also launched the UK's national DAB radio and Digital Terrestrial Television networks. Most recently, Arqiva has played a pioneering role in the roll-out of the national smart energy and water metering networks.

Arqiva was a founder member of Digital UK (DUK), Freeview, YouView and Digital Radio UK (DRUK). Freeview is the largest TV platform in the UK delivering over 100 TV and Radio channels to the UK public. Arqiva owns and operates the networks for all of the Freeview multiplex licence holders and is the licence holder for two of the national DTT multiplexes. DRUK has worked previously to promote digital radio via liaison with the UK supply chain, business-to-business and consumer marketing. We are also a member of WorldDAB.

We are a shareholder and operator for both commercial national DAB radio multiplexes and transmission provider for the BBC national DAB radio multiplex. We also provide end-to-end transmission services for analogue and digital radio networks for customers including the BBC, Global Radio, Bauer Media and Wireless as well as other independent radio groups.

Through our wholly owned subsidiaries Arqiva operates 25 local DAB digital radio multiplexes. These multiplexes cover a number of regions of the UK, predominantly in the Midlands, South West and the south of England.

Our major customers include the BBC, Bauer Media, Global Radio, Wireless, ITV, Channel 4, Five, Sky, UKTV, QVC, GB News and Al Jazeera Networks.

Arqiva is owned by a consortium of infrastructure investors and has its headquarters in Hampshire, with major UK offices in London, Buckinghamshire and Yorkshire and operational centres in the Midlands and Scotland.