

Your response

Question	Your response
<p>Question 1: Hybrid sharing could mean that the upper 6 GHz band will be used for mobile outdoors and Wi-Fi indoors. What are your views on the priorities for each of these two services, assuming that suitable coexistence mechanisms are developed?</p>	<p>N.</p> <p>Please see the separate response document.</p>
<p>Question 2(a): Hybrid sharing could mean that the upper 6 GHz band will be used for mobile in some locations, and Wi-Fi in others. We would like feedback on the priorities for each of these two services, assuming that suitable coexistence mechanisms are developed.</p> <p>From the point of view of mobile, is the upper 6 GHz band most useful to provide outdoor coverage, or indoor coverage? Is it most useful in urban areas, or in those base stations that are currently carrying more traffic, or some other split?</p>	<p>N.</p> <p>Please see the separate response document.</p>
<p>Question 2(b): Similarly, what are the priorities from the point of view of Wi-Fi deployments?</p>	<p>N.</p> <p>Please see the separate response document.</p>
<p>Question 3: What are your views on a modified AFC or SAS-type approach to enable hybrid sharing? What additional work do you think would be required?</p>	<p>N.</p> <p>Please see the separate response document.</p>
<p>Question 4: How could existing access protocols and sensing mechanisms be leveraged (i.e., those in Wi-Fi or 5G NR-U) to enable hybrid sharing?</p>	<p>N.</p> <p>Please see the separate response document.</p>
<p>Question 5: What mechanisms could potentially enable device-to-device connectivity?</p>	<p>N.</p> <p>Please see the separate response document.</p>
<p>Question 6: If hybrid sharing is eventually adopted, and requires licensed mobile to operate at medium power, in what way would mobile networks use the upper 6 GHz band?</p>	<p>N.</p> <p>Please see the separate response document.</p>
<p>Question 7: How would you suggest that the mechanisms presented here can be used, enhanced, or combined to enable hybrid</p>	<p>N.</p> <p>Please see the separate response document.</p>

sharing or are there any other mechanisms that would be suitable that we have not addressed?	
<p>Question 8(a): Assuming the future of the band includes indoor use for Wi-Fi and outdoors use for mobile:</p> <p>How could this be achieved without creating or suffering interference?</p>	<p>N.</p> <p>Please see the separate response document.</p>
<p>Question 8(b): Could there be a combination of technical adjustments such as power limits and other mechanisms (including databases or sensing mechanisms)?</p>	<p>N.</p> <p>Please see the separate response document.</p>
<p>Question 9(a): We are interested in input about the importance of the upper 6 GHz band for its incumbent users, and on the potential impact of hybrid sharing of the band.</p> <p>What evidence do you have on whether incumbents are likely to coexist with hybrid sharing of the band with mobile and Wi-Fi? Are there unique advantages of the upper 6 GHz band for these uses?</p>	<p>N.</p> <p>Please see the separate response document.</p>
<p>Question 9(b): What are your views on the initial analysis we have conducted around hybrid sharing and coexistence with incumbents?</p>	<p>N.</p> <p>Please see the separate response document.</p>
<p>Question 9(c): For any incumbent uses that you view as unlikely to be able to coexist, what alternatives are there? What are the barriers that might prevent those alternatives?</p>	<p>N.</p> <p>Please see the separate response document.</p>
<p>Question 10: Do you have any other thoughts that you would like to share about hybrid sharing in the upper 6 GHz band, or about hybrid sharing more generally and its potential for applications in other bands?</p>	<p>N.</p> <p>Please see the separate response document.</p>
<p>Question 11: Do you have any other comments to make on these proposals or on the future use of the upper 6 GHz band?</p>	<p>N.</p> <p>Please see the separate response document.</p>

Arqiva Submission: Ofcom Consultation ‘Hybrid sharing: enabling both licensed mobile and Wi-Fi users to access the upper 6 GHz band’

Arqiva welcomes the opportunity to respond to the Ofcom consultation on Hybrid sharing: enabling both licensed mobile and Wi-Fi users to access the upper 6 GHz band.

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 consultation questions.

Background – Arqiva use of upper 6GHz band spectrum

Arqiva has a number of fixed links licensed by Ofcom in the upper 6 GHz band spectrum. 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 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 consultation questions

Question 1

Hybrid sharing could mean that the upper 6 GHz band will be used for mobile outdoors, and Wi-Fi indoors. What are your views on the priorities for each of these two services, assuming that suitable coexistence mechanisms will be developed?

Arqiva agrees with the statement in the consultation that “There is a great deal of uncertainty around how demand for wireless data will grow over the next decade – and what the role of the upper 6 GHz band might be in supporting this.”.

We recognise that the use of Wi-Fi indoors is less likely to provide a challenge to the existing use of this spectrum for the services already provided over fixed links. On this basis we would see it as sensible for the use for Wi-Fi indoors to have the higher priority and we would be extremely concerned about the use for mobile outdoors near any of the existing licensed fixed links.

Question 2

Hybrid sharing could mean that the upper 6 GHz band will be used for mobile in some locations, and Wi-Fi in others. We would like feedback on the priorities for each of these two services, assuming that suitable coexistence mechanisms will be developed.

a) From the point of view of mobile, is the upper 6 GHz band most useful to provide outdoor coverage, or indoor coverage? Is it most useful in urban areas, or in those base stations that are currently carrying more traffic or some other split?

b) Similarly, what are the priorities from the point of view of Wi-Fi deployments?

As with the response to question 1, we recognise that the use of Wi-Fi indoors is less likely to provide a challenge to the existing use of this spectrum for the services already provided over fixed links. On this basis we would see the use for Wi-Fi indoors as having the higher priority and would be concerned about the use for mobile outdoors near any of the existing licensed fixed links.

Question 3

What are your views on reusing a modified AFC or SAS-type approach to enable hybrid sharing? What additional work do you think would be required?

Arqiva recognises that this consultation is exploring the options for licensed mobile services and expanded Wi-Fi use, however we are keen that the protection of any incumbent use of the spectrum is also clearly addressed in the development of any approach to hybrid sharing of this spectrum band. We would ask that this is explicitly included as additional work with these developments.

Question 4

How could existing access protocols and sensing mechanisms be leveraged (i.e. those in Wi-Fi or 5G NR-U) to enable hybrid sharing?

As with the response to question 3, Arqiva recognises that this consultation is exploring the options for licensed mobile services and expanded Wi-Fi use, however we are keen that the protection of any incumbent use of the spectrum is also clearly addressed in the development of any approach to hybrid sharing of this spectrum band. We would ask that this is explicitly included as additional work with these developments.

Question 5

What mechanisms could potentially enable device-to-device connections?

Arqiva does not provide any response on this.

Question 6

If hybrid sharing is eventually adopted, and requires mobile to operate at medium power, in what way would mobile networks use the upper 6 GHz band?

Arqiva does not provide any response on this.

Question 7

How would you suggest that the mechanisms presented here can be used, enhanced, or combined to enable hybrid sharing or are there any other mechanisms that would be suitable that we have not addressed?

Arqiva does not provide any response on this.

Question 8

Assuming the future of the band includes indoor use for Wi-Fi and outdoors use for mobile:

a) how could this be achieved without creating or suffering interference?

b) Could there be a combination of technical adjustments such as power limits and other mechanisms (including databases or sensing mechanisms)?

As with the response to question 3, Arqiva recognises that this consultation is exploring the options for licensed mobile services and expanded Wi-Fi use, however we are keen that the protection of any incumbent use of the spectrum is also clearly addressed in the development of any approach to hybrid sharing of this spectrum band. We would ask that this is explicitly included as additional work with these developments.

Question 9

We are interested in input about the importance of the upper 6 GHz band for its incumbent users, and on the potential impact of hybrid sharing of the band.

a) What evidence do you have on whether incumbents are likely to coexist with hybrid sharing of the band with mobile and Wi-Fi? Are there unique advantages of the upper 6 GHz band for these uses?

Arqiva will regularly review the networks that it uses. The use of the upper 6GHz band for fixed links is not seen as a preferred band to use due to the equipment sizes required for installation.

We would like it to be recognised that in many cases Arqiva has previously sought alternative frequency bands for fixed links, such as in the 7.5 GHz and 13 GHz bands. These have not been available, either from the frequencies that Ofcom can license, or via other links being able to provide the capacity required for the fixed link distribution service for the broadcast customers. Often, even in technology refresh programmes, Arqiva has had to continue to use the upper 6GHz spectrum as the only band available to meet the communications requirements it needs to deliver.

b) What are your views on the initial analysis we have conducted around hybrid sharing and coexistence with incumbents?

Arqiva supports the initial analysis that if the upper 6 GHz band were to be deployed for high power outdoor licensed mobile sharing on existing mobile network operator sites, a significant proportion of the fixed links in the UK could potentially suffer unacceptable interference.

We recognise the keyhole shape for the separation zone that has been used and would point out that some of the fixed link paths that we use currently are nearly 50km in length.

c) For any incumbent uses that you view as unlikely to be able to coexist, what alternatives are there? What are the barriers that might prevent those alternatives?

Arqiva uses licensed fixed links for communications with sites across the UK. These are often in locations remote from metropolitan areas where telecommunication infrastructure will not be established for other purposes.

For a number of links, Arqiva has previously had to migrate fixed links to allow for technology changes or spectrum management reasons of Ofcom. The alternatives can include a migration to alternative frequencies in the same band or alternative bands. This can also involve additional expenditure to implement additional sites so as to be able to re-route fixed links via a higher number of mid-point sites. This adds both additional expense and operational risk from the use of these additional sites.

As in the response to question 9 b), we would like it to be recognised that in many cases Arqiva has previously unsuccessfully sought alternative frequency bands for fixed links, such as in the 7.5 GHz and 13 GHz bands. These have not been available, either from the frequencies that Ofcom can license or being able to provide the capacity required for the fixed link distribution service for the broadcast customers. Often, even in technology refresh programmes, Arqiva has had to continue to use the upper 6GHz spectrum as the only band available to meet the communications requirements it needs to deliver.

Question 10

Do you have any other thoughts that you would like to share about hybrid sharing in the upper 6 GHz band, or about hybrid sharing more generally and its potential for applications in other bands?

Arqiva does not provide any response on this.

Question 11

Do you have any other comments to make on these proposals or on the future use of the upper 6 GHz band?

Arqiva does not provide any response on this.



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.