Ofcom Call for Input: Potential spectrum bands to support utilities sector transformation

We welcome the opportunity to respond to Ofcom's *Call for Input: Potential spectrum bands to support utilities sector transformation*.

Arqiva is a critical national infrastructure provider with a strong track record for delivering communications solutions, including to the utilities sector. We are the only large-scale provider of smart water metering in the UK, providing water companies with the data they need to meet environmental targets for cutting leakage and reducing water consumption. We are building on these networks to deliver additional technology solutions, including sewer level monitoring, which helps mitigate pollution and internal sewer flooding incidents, and water quality monitoring. Further, Arqiva works closely with the Data Communications Company, (DCC), on the rollout of the smart energy communication network for the North of England and Scotland. We also offer the utilities sector hybrid communications solutions, which combine multiple technologies to deliver secure communications networks across the entire UK, enabling remote monitoring and control of assets. We expect to play a relevant role in helping energy network operators further digitise their distribution networks and address the use of renewable energy sources and distributed generation.

We are continuing to evolve and grow our communications services for the utilities sector, to meet their future needs and enable the wide-ranging benefits that enhanced networks and data services can deliver for utilities providers, their consumers, and the environment. Spectrum is a critical enabler of these communications solutions. We welcome ongoing engagement with Ofcom and industry stakeholders on the future of spectrum use for utilities, to ensure existing and future communications needs can be accommodated to best benefit industry and consumers.

In this response, we first provide comments on the overarching principles that we believe should guide Ofcom's approach to the consideration of future spectrum allocations for the utilities sector. We then provide comments on Ofcom's consideration of the 412-414 MHz spectrum paired with 422-424 MHz, (412 MHz Spectrum), as a possible candidate band, which Arqiva holds a licence for and already uses to deliver important communications services.

Guiding principles for the future consideration of spectrum for the utilities sector

The UK's electricity, gas and water sectors deliver critical services, and looking to the future, their communications needs are expected to grow. Smart, connected infrastructure offers wide-ranging opportunities, including real-time monitoring and remote operation of assets, providing the capacity to deliver significant operational efficiencies and broader social benefits. For example, smart water metering is enabling companies to save millions of litres of water along with the energy used to treat and distribute that water, through the more rapid identification of leaks, helping alleviate pressure on the UK's public water supplies and reduce carbon emissions. The increasing investment in geographically spread renewable energy sources and the rapidly changing needs for the transmission and distribution networks require communications with increasingly more sensors and equipment. The wider deployment of smart, connected devices across utilities infrastructure assets supports the smooth and effective operation of critical networks that UK households and business depend on.

In its Call for Input, Ofcom outlines that it is aiming to open discussion about the relative benefits and disadvantages of deploying a private network for utilities communications within certain spectrum bands,

to meet the sector's future communications needs. Several 'candidate' bands are identified, including bands that are already in use and where the licensee is paying annual licence fees for the use of that band, as is the case for the 412 MHz spectrum.

As a guiding principle, we believe it would be sensible and appropriate for Ofcom to first encourage industry stakeholders with potential interest in using licensed spectrum to engage directly with the licence holder of that spectrum and to also explore options to work with specialist service providers to deliver the services required by the utilities sector. Arqiva is a specialist in providing managed communication services across sectors including the water, energy and media sectors. Our company is built around the provision of these services and we have invested significantly in our capabilities to do this. We pride ourselves on our track record as a provider of critical national communication services.

We welcome the opportunity to engage with the utilities sector to discuss its requirements and explore how a company such as Arqiva might support them both through our existing infrastructure and investments, through our access to and understanding of the use of radio spectrum and through our technical expertise. As also highlighted in the Call for Input paper, there are existing mechanisms built within the licensing regime to enable industry engagement on spectrum, if that is appropriate. Specific access to the 412 MHz spectrum band in a defined geographical location could, for example, be established through spectrum trading. This is a market mechanism enabling the optimum use of spectrum, by providing a way for spectrum to migrate to the entity best positioned to use that spectrum most productively and efficiently. We believe that this mechanism is an effective tool and are open to exploring this if appropriate. We encourage Ofcom to point industry stakeholders towards directly engaging with spectrum licence holders – such as Arqiva as the 412 MHz spectrum licence holder – where they are interested in the potential use of licensed spectrum so that they can explore the direct provision of services using the spectrum or to discuss other approaches to ensure the efficient use of spectrum.

Where spectrum is not already allocated, it is right that Ofcom conducts a review of its potential use. This includes considering the range of potential use cases for spectrum, and the interaction between different use cases and existing deployments in adjacent bands. Interference risks must be avoided to ensure the effective operation of technologies and services and truly to get the most value out of spectrum.

The 412 MHz spectrum band is used to deliver highly important communications networks for utilities

The 412 MHz spectrum was auctioned in 2006 and was awarded to Arqiva on a national licence with a 15-year minimum licence term. In 2008, Arqiva traded the licence to include Airwave as a co-licensee. In 2021, Ofcom published its decision to apply Administered Incentive Pricing for the frequency band 412-414 MHz paired with 422-424 MHz, and Arqiva pays an ongoing annual licence fee for this spectrum licence.[1]

We use this spectrum to deliver important services. The 412 MHz spectrum is used to deliver smart energy metering networks in the North of England and Scotland, which provide consumers with insight into their energy consumption. We further use the 412 MHz spectrum to deliver smart water metering networks that help water companies save millions of litres of water through reducing leaks and enabling greater engagement with consumers around water consumption reduction. Demand for smart water metering is increasing exponentially, as companies look to accelerate the deployment of solutions that

[1] https://www.ofcom.org.uk/ data/assets/pdf_file/0018/225081/statement-412-mhz-licence-fees.pdf

help address the growing risk of water scarcity across the UK. This aligns with the sector's performance commitments through the price review period process, regulated by Ofwat, and the sector's statutory targets to reduce water demand. Smart metering is a vital technology which is set to help the UK address the growing challenges we face as a nation around water resources, climate change, energy efficiency and wasting water through leaks. The 412 MHz spectrum underpins these vital energy and water metering services and demand for its use is set to grow considerably over the coming decade and beyond.

We are further building on the smart networks we have delivered to provide additional services benefitting both industry and UK consumers. This includes delivering devices and managed services for water quality monitoring and sewer level monitoring with additional services for energy and other industries being evaluated and considered all the time. These services are set to be of significant importance to the utilities industry, helping enable the energy and water sectors to deliver high performance standards and mitigate problems such as risks of pollution and sewer flooding caused by blockages in sewer networks.

We plan for the 412 MHz spectrum band to be fully utilised leveraging the considerable investments we are making as a company in this area and we will continue to build on our networks and services to meet industry's communication needs. It is important that this spectrum is safeguarded both for the ongoing delivery of the current services it supports, as well as to enable the planned and predicted growth in these services in the coming years.

We encourage industry stakeholders to engage with Arqiva on the potential future use of the 412 MHz spectrum band in Northern Ireland

We note Ofcom's reference to the use of the 412 MHz spectrum specifically in Northern Ireland.

As mentioned, Arqiva is a critical national infrastructure provider with significant experience in serving the utilities industry, providing secure and reliable networks to deliver a range of communications services. We are set up to serve the sector and help it meet its communications needs as these evolve. There is opportunity for the utilities industry and communications network providers, such as Arqiva, to work together on the delivery of solutions to meet growing communications needs, including potentially in the 412 MHz spectrum band in Northern Ireland. We are open to discussion with industry stakeholders about the possibilities in this area. We have already engaged directly with Northern Ireland Electricity (NIE) in initial discussions to understand their requirements either for a trial of communications services or use of the 412 MHz spectrum, recognising Arqiva's overall plans for the use of this spectrum. We are open to further discussions with them and others to explore opportunities and requirements in this area.

As highlighted above, there is also the possibility of spectrum trading built into the licensing regime if required. This also provides a mechanism to open discussion between commercial entities on the possible use of the 412 MHz spectrum in Northern Ireland if that is needed. As the licence holder for the 412 MHz spectrum, we are open to holding these discussions with any party with a specific need. We are also best placed to discuss and explore the interference challenges if a different use case was adopted in Northern Ireland. This is a key issue as highlighted below.

It is essential to avoid risks of interference in the 412 MHz spectrum band

In any consideration of use of the 412 MHz spectrum in any part of the UK, it is critical that risks of interference are avoided and any alternative use or provision of a service does not interfere or provide a

risk of interference to existing or planned uses in other locations. As highlighted above, Arqiva expects the 412 MHz spectrum band to be fully utilised to deliver communications networks across Great Britain and potentially all of the UK. The 412 MHz spectrum band is already used for the delivery of smart energy metering in the South West of Scotland and the North West of England. It is used for smart water metering in a growing set of locations and also by Airwave in in South East England.

In considering a scenario where the 412 MHz spectrum band was potentially to be used for a private network in Northern Ireland, there is likely to be a risk of interference given the proximity of these areas. The distance from Northern Ireland to the coast of Scotland is about 38-40 kilometres, over a sea path. There is the potential for interference from Northern Ireland to impact smart metering services using the 412 MHz spectrum band along the Scottish coast and in Cumbria. This could impact a significant number of households. **Appendix A** provides an initial analysis of potential interference to illustrate these risks. More detailed analysis, informed by more technical information of any proposed approach in Northern Ireland would need to be conducted to get a clearer picture of the risks involved with this approach. Arqiva has approached NIE and we would be open to a dialogue to explore this area and to participate in its planning and development of thinking around new services.

We also highlight this issue for Ofcom to consider and ensure that in any approach it suggests or adopts that the risks of any interference into existing and planned services is central to its thinking and that services utilising the 412 MHz spectrum band are safeguarded so that they continue to operate effectively for utilities companies, government, emergency services and consumers.

For the other candidate spectrum bands considered, it is sensible for Ofcom to explore their use, subject to evaluating other approaches to meeting utilities' communications needs and the potential future uses of these spectrum bands

Ofcom should consider whether there is a need for a private network using additional, valuable spectrum resources, or if future communications needs could instead be met using a hybrid communications approach and dialogue with existing specialist communications services providers set up to serve the needs of the utilities sector and others. By a 'hybrid communications approach', we mean the development of closed end-to-end networks using a combination of technologies, including cellular and satellite technologies, which utilise different spectrum bands. This approach is effective for the delivery of data communications networks for remote monitoring and control of devices, as it enables the deployment of different technology solutions based on coverage and data requirements. There is also the added benefit that a hybrid communications approach could be more widely deployed without the need for an additional spectrum allocation. It is not clear that dedicated spectrum and a private network is required by the utilities sector or whether there is scope to adopt solutions provided by third parties drawing on their technical expertise and experience of bring together different technology and network solutions, their existing infrastructure, their expertise in utilising both licensed and unlicensed spectrum and ability to provide specialist managed communication services.

In addition, we encourage Ofcom to consider fully the range of future technologies and services which could be delivered using the proposed candidate spectrum bands. As highlighted above, the 412 MHz spectrum is already set to be utilised fully to deliver valued communications services to the utilities sector. For the other spectrum bands identified, there might also be other use cases which should be considered. It is necessary to build in this thinking when considering candidate spectrum bands, to avoid taking decisions that could result in missed opportunities for industry and UK consumers.

We would welcome the opportunity to engage with the industry on future communications networks across the different spectrum bands that may come to be used. As highlighted above, we stand ready to support the sector in meeting its future communications needs and have a proven track record of delivery of communications network solutions.

Interference risks across other candidate bands must be assessed to avoid risks to other critical services

Above, we highlighted the need to consider interference risks in relation to the use of the 412 MHz spectrum band in Great Britain. Ofcom has further identified as candidate bands for a future private network part or all of 451-456 MHz / 461-466 MHz or 452.5-457.5 MHz /462.5-467.5 MHz. It is highlighted that digital terrestrial television (DTT) operates in an adjacent band, 470-694 MHz. It is essential that Ofcom undertakes a rigorous process to determine if any interference risks would exist and potentially impact on DTT reception. DTT is a highly used platform across the UK, accessed by over 16 million households. Any impact to DTT's availability would have a substantial impact on viewers and their ability to access free-to-air TV services.

We note that Ofcom has already highlighted the potential risk of interference with the RAF Fylingdales radar use of spectrum. It is important to ensure that any existing mitigation measures for interference are maintained and that no further risk of interference can be introduced that will impact the related spectrum use.

Specific response to Ofcom's consultation questions

In the remainder of this response, where appropriate, we have provided answers to the specific questions provided by Ofcom.

Thank you for consideration of this submission.

Question 1: Have we correctly identified the key changes in the utilities sector that could lead to additional spectrum requirements?

No response.

Question 2: What alternative communication solutions might play a role in meeting the future operational communication needs of the utilities sector, alongside or instead of additional spectrum for a private network?

Ofcom should consider the potential of a hybrid communications approach to meet the future communications needs of the utilities sector. A hybrid approach would involve the use of multiple technologies to deliver secure communications networks, including cellular and satellite technologies.

This solution is already serving as an alternative for connections previously using the PSTN copper network, enabling the remote monitoring and control of devices. There is opportunity to further deploy hybrid communications approaches at a greater scale to meet growing communications needs from the gas, water, and energy industries.

Question 3: Are there any other spectrum bands we should consider for use by utilities?

No response.

Question 4: Do you have any comments on the three bandwidths we have considered that might be necessary to support a private network for utilities? Please reference our capacity analysis in annex 7 where relevant.

No response.

Question 5: Do you have any comments on our approach to examining each potential candidate spectrum band, including the factors relevant to assessing suitability, and the capacity and coverage analysis provided in annexes 7 and 8?

No response.

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

Arqiva and Airwave are co-licensees of the 412 MHz spectrum band.

Arqiva utilises this band to deliver smart metering networks. The 412 MHz spectrum is used to deliver smart energy metering networks in the North of England and Scotland, which provide consumers with insight into their energy consumption and additional functions over time. We have also delivered over 1.4 million smart water meters to date to customer including Thames Water and Anglian Water and this is set to grow considerably over the coming years and decades. The data delivered by smart water meters is enabling a range of significant benefits. Smart water meters help companies detect leaks faster and engage with consumers around their water use, and where they can save water. This is saving millions of litres of drinking water, and the energy used to treat and distribute it, helping reduce the risk of water deficits in the future and improving environmental outcomes.

We are building on these networks to meet additional communications needs in the utilities sector. We have developed water quality and sewer level monitoring solutions, to further support improved outcomes from the water industry and are exploring new use cases all of the time across energy and other sectors. We have invested heavily in the use of this spectrum and plan for the 412 MHz spectrum band to be fully utilised as we continue to build on our networks and services to meet industry's communication needs.

Arqiva is a critical national infrastructure provider with significant experience in serving the utilities and other sectors, and we are well placed to serve the sector and help it meet its communications needs as these evolve. There is opportunity for the utilities industry and communications network providers, such as Arqiva, to work together on the delivery of solutions to meet growing communications needs, including potentially in the 412 MHz spectrum band in Northern Ireland. We are open to discussion with industry stakeholders about the possibilities in this area.

Alternatively, as highlighted in the Call for Input paper, access to the 412 MHz spectrum in Northern Ireland could be established through commercial arrangements, including spectrum trading. We are open to these discussions with industry and urge Ofcom to direct utilities stakeholders to speak directly to Arqiva as the 412 MHz spectrum licence holder about this.

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

As highlighted in the Call for Input paper, DTT is delivered using the adjacent 470-694 MHz. DTT is a highly used service across the UK for access to free-to-air TV services. It is critical that Ofcom conducts a robust analysis of any potential interference to eliminate any risks to the availability of DTT.

Question 8: Do you consider that changes in the spectrum environment for the 450 MHz band mean that there is a case for re-examining whether this band should be reconfigured in the UK to align with the harmonised band plan?

We would re-affirm the response to Question 7 for Question 8 as well.

Question 9: Do you have any comments on our overview of the 700 MHz band in GB and NI? Please consider the specific factors we have discussed in your response.

No response.

Question 10: Do you have any comments on our overview of the 800/900 MHz band in NI? Please consider the specific factors we have discussed in your response.

No response.

Question 11: Do you have any comments on our overview of the 1900 MHz band in GB and NI? Please consider the specific factors we have discussed in your response.

No response.

Question 12: Which band(s) do you consider we should examine further with a view to developing consultation proposals to enable their use in a private network, if this were needed? Please reference the factors we have considered where appropriate and provide separate answers for GB and NI if relevant.

As stated earlier in this response, Arqiva believes that the appropriate approach to be followed for the 412 MHz spectrum is to allow the existing industry parties to engage over the use of the spectrum and any services which might be required and also potentially any spectrum trading if required. Ofcom already has put in place the mechanisms to allow this and it would not appear necessary or efficient to develop further consultation proposals for this existing licensed spectrum.

Appendix A: [✂]