

## **Ofcom consultation on the award of available spectrum: 2500-2690 MHz, 2010-2025 MHz and 2290-2300 MHz**

### **About Arqiva**

1. Arqiva has a 50-year history in transmission and has helped pioneer the technologies of the digital age. Formerly the broadcast division of ntl Group, Arqiva was purchased in 2005 by an international consortium led by Macquarie Communications Infrastructure Group.
2. Arqiva is responsible for the entire analogue transmission networks for ITV1, Channel 4 and five and played a leading role in the introduction of digital terrestrial television, for which Arqiva has built the national networks carrying the Digital 3 & 4 and SDN multiplexes. The network for Digital 3 & 4, with its regional structure, is one of the most complex digital terrestrial TV networks in the world.
3. Arqiva owns and operates some 350 FM and 70 MF transmitters, with customers ranging from the large radio groups such as GWR, EMAP, Chrysalis, Capital and Scottish Radio Holdings, to small community-based stations, and has played a leading role in the development and introduction of digital radio in the UK, supporting the commercial radio industry in making the transition from analogue. Arqiva built the transmission network for Digital One, the national commercial DAB multiplex, and has multiplexing and transmission contracts for 42 of the 46 local and regional DAB multiplexes.
4. In respect of mobile TV, Arqiva undertook the feasibility studies, field trials and network design for the Singapore mobile DVB-T network. In addition, Arqiva also operates the infrastructure for:
  - the Oxford DVB-H trial;
  - the Mobile TV Now! L-Band DMB/DAB-IP trial, currently on air in London;
  - the Cambridge technology trials: the convergence trial in partnership with Microsoft and the second in partnership with BSkyB, comparing the performance of mobile TV broadcasting using MediaFLO™ technology with DVB-H.In partnership with O2, Arqiva has also just launched a 6-month trial of DVB-H mobile TV for 350 O2 customers in the Greater Dublin area.
5. Arqiva has shown its willingness to bid for spectrum with the purchase of 412-414MHz paired with 422-424MHz, the first major auction of Ofcom's current spectrum awards programme. Arqiva is evaluating the deployment of networks in this spectrum for specific customers and, operating as a band manager, is in the process of sub-leasing some of this spectrum
6. All of the above activities are underpinned by Arqiva's Spectrum Planning Group which has extensive experience of planning analogue and digital TV and radio networks and which also offers a coverage prediction service for Arqiva's radiocommunications customers.

7. Arqiva's Satellite Media Solutions operates 4 teleports with over 70 major uplinks and is an established world leader in media content management and distribution services for customers across the globe. Arqiva delivers solutions for Satellite Television, Occasional Video, Television Facilities, Outside Broadcasts, Digital Media Networks and International Connectivity. Arqiva is also in the process of acquiring BT's satellite broadcast business.

## **Answers to consultation's questions**

*Question 1: Do you agree with these proposals for the awards of the three bands or have any other comments on the contents of this document?*

Arqiva agrees with the general proposals for the awards of these 3 spectrum bands; in particular:

- That the licences should be awarded for an initial term of 20 years, which is sufficiently long to incentivise investment in innovative services, and that those licences should be UK-wide as Ofcom cannot anticipate for which areas there may be demand for spectrum and attempting to do so would further complicate an auction design which, for the 2.6 GHz spectrum, is already the most complicated attempted. If sub-UK demand for any of the offered spectrum emerges, band managers should emerge to meet it.
- That the licences should be tradable, although bidders will want clarity on how spectrum initially awarded as paired or unpaired lots could "change mode" later, without which the ability to launch innovative services, and the efficiency with which the spectrum may be used, could be reduced.
- That the auction should determine the initial allocations of 2.6 GHz spectrum between paired and unpaired lots, although Arqiva recognises that this approach, when combined with retaining the 120 MHz FDD duplex spacing, could lead to a reduced efficiency with which unpaired allocations could be used to the extent that the TDD allocation exceeds the 50 MHz proposal of the CEPT band plan.
- If a spectrum cap is felt necessary for the 2.6 GHz spectrum, then 90 MHz seems a reasonable level to set it at as this is sufficiently high as to be unlikely to prohibit most anticipated, rational, efficient uses of the spectrum.

*Question 2: Do you agree with the analysis in section 5 or have any comments on adjacent interference issues?*

No comment at this stage.

*Question 3: Do you agree that Ofcom should authorise use of the spectrum bands 2500-2690 MHz, 2010-2025 MHz and 2290-2300 MHz?*

Yes, but Arqiva recommends that Ofcom does not provide the existing PMSE users of the 2.6 GHz spectrum with their 3 months' notice until licences for that spectrum have been awarded. This would provide greater certainty to the broadcasters, whose wireless cameras do not appear to be using this spectrum with the decreasing intensity predicted by Ofcom (undoubtedly a refection on the poor substitute spectrum offered).

This approach would also be consistent with Ofcom's objective that spectrum should not remain unused or underused any longer than necessary (paragraph 6.29), where it is highly unlikely that any of the new licensees would have placed contracts for the necessary infrastructure to be built; had that infrastructure built and tested; and then launched services all within the first 3 months of their licence period.

*Question 4: Do you agree that awarding licences by auction would be the appropriate mechanism for authorising use of the spectrum bands 2500-2690 MHz, 2010-2025 MHz and 2290-2300 MHz?*

Arqiva agrees that no Government, regulator or company can anticipate what would be the optimal use of any spectrum over the medium – long term and consequently the basic principle should apply that willingness to pay should determine the allocation of spectrum.

The tradability of the proposed licences, when combined with their essentially technology- and service-neutral nature, will minimise the risk for bidders and should avoid a repeat of the 3G auction where much of the auctioned spectrum remains underused today.

However, while retaining an auction as the basic means of allocating spectrum, where Ofcom identifies potential uses of spectrum which would be likely to be a broad source of value to society or where the user base is sufficiently disparate that its ability to participate in an auction would be limited, then Arqiva believes that Ofcom could be justified in offering a degree of preference.

The most obvious form of providing preference consistent with an auction approach would be to offer bidder credits, although in certain circumstances Ofcom could be justified in reserving spectrum or guaranteeing access to other licensees' spectrum as it has done on several occasions recently:

- 410-412 MHz paired with 420-422 MHz was withdrawn from last year's 412 MHz auction and reserved for use by the emergency services
- Channel 69 has been proposed to be withdraw from the Digital Dividend Review auction to be reserved for low power uses
- PMSE use has been proposed to have a continuing right of access to interleaved spectrum in the Digital Dividend Review until at least 2012.

While other spectrum bands under consideration, specifically that of the Digital Dividend Review, give obvious rise to considerations of preference, the only potential use of the 3 spectrum bands being consulted on here which Arqiva would suggest deserves such consideration is the existing use of the 2.6 GHz band: digital wireless cameras.

*Question 5: Do you agree that it is likely to be in the interests of citizens and consumers to proceed with the award of the 2.6 GHz and 2010 MHz bands as soon as practicable, rather than to delay the award pending reduction in uncertainty relating to other bands?*

*Question 6: Do you agree Ofcom should aim to award the bands 2500-2690 MHz, 2010-2025 MHz and 2290-2302 MHz by the end of 2007, while keeping the position on the 2.6 GHz and 2010 MHz bands under review in the light of possible developments in European regulatory fora?*

Arqiva agrees that, as with any of the spectrum in Ofcom's spectrum award programme, Ofcom should offer spectrum to the market as soon as practical balancing any perceived additional certainty from delay, whether from additional assessments of new technologies or services (and potentially modifying the auction design to accommodate them) or from waiting for potential regulatory decisions in other countries or the European Commission, against the likely consumer welfare loss.

This is subject to the caveat that where Ofcom is aware of a specific meeting when a relevant external regulatory decision will be taken, then the auction should not precede that decision. However Arqiva believes that the uncertainty about the potential for a Spectrum Decision in respect of the 2.6 GHz band is unlikely to be resolved soon, so this should not delay the awards process.

*Question 7: Do you agree with Ofcom's proposals for licence conditions (technology neutrality, tradability, conditions of tenure and absence of roll-out obligations)?*

Yes, although bidders will want clarity on how spectrum initially awarded as paired or unpaired lots could "change mode" later as this will clearly impact the tradability of those lots.

To the extent that it is deemed socially beneficial for any potential user of this spectrum to agree in advance to roll-out obligations of a specific technology or service, then bidder credits could be offered as the *quid pro quo*.

Arqiva recognises that the 3G operators did agree to roll-out obligations and were awarded spectrum which was service-specific and wasn't tradable, but that spectrum was awarded in different market and regulatory circumstances and Ofcom should not be bound in this auction by considerations of the earlier auction.

*Question 8: Do you have views on whether or not there should be a "safeguard" cap on the amount of spectrum that any one bidder could win in an award for the 2.6 GHz bands and, if so, do you have a view on whether 90 MHz would be an appropriate size for a safeguard cap?*

Given the technology- and service-neutral nature of the proposed licences, and spectrum substitutability for many potential uses of the 2.6 GHz spectrum, it is impossible to predict which downstream markets may be adversely affected by any spectrum hoarding.

A spectrum cap would also be considerably interventionist and may set an unfortunate precedent for later spectrum auctions in the minds of potential bidders and vested interests.

However Arqiva recognises the concerns of many potential bidders in this auction. Establishing a spectrum cap, set sufficiently high so as not to prohibit most anticipated, rational, efficient uses of the spectrum, would help to allay these concerns. If a spectrum cap were to be introduced, the proposed level of 90 MHz is sufficiently high.

*Question 9: Do you agree with Ofcom's proposal to package spectrum as lots of 2 x 5 MHz for paired use and 5 MHz lots for unpaired spectrum and to allow the aggregation of lots by bidders?*

Yes.

*Question 10: Do you agree with Ofcom's proposed approach to allowing the respective amounts of paired to unpaired spectrum for the band 2500-2690 MHz to be varied (maintaining the 120 MHz duplex spacing and allowing additional unpaired spectrum, if needed, at the top end of the band)?*

Yes.

*Question 11: Do you agree with Ofcom's proposals for a 5 MHz restricted block between FDD and TDD neighbours and between TDD and TDD neighbours and with a modified out-of-band base station mask for second adjacent 5 MHz blocks?*

Arqiva is not in a position to comment at this stage.

*Question 12: Do you agree with Ofcom's proposals to award the 2010 MHz band as a single 15 MHz lot?*

Yes.

*Question 13: Do you agree with Ofcom's proposals to award the 2290 MHz band as a single 10 MHz lot?*

*Question 16: Do you agree with Ofcom proposals to award the 2290 MHz band through a second price sealed bid auction?*

Yes.

*Question 14: Do you agree with Ofcom's proposals to combine the award of the 2.6 GHz and 2010 MHz bands and to hold the award of the 2290 MHz band separately and in advance?*

Yes.

*Question 15: Do you agree with Ofcom's proposals for a two-stage auction design for the 2.6 GHz and 2010 MHz bands?*

Yes, this is the inevitable follow-on from permitting the auction to determine the initial allocations of unpaired and paired lots. However the proposed auction design is the most complicated yet proposed which may discourage some bidders.

In addition, Arqiva has a particular concern that the potential for incoming interference (e.g. from air traffic control radars operating in 2.7 – 3.1 GHz) is potentially significant but not evenly distributed by geography or channel, yet bidders only have a single opportunity to express their preference for specific channels and that this opportunity, the Final Assignment, is proposed to be an uncapped, single round, sealed bid which would seem to undermine some of the advantage to bidders of having a transparent start to this auction process.

*Question 17: Do you have a preference for either of the two approaches to specifying technical licence conditions?*

At this stage, absent any knowledge of the potential uses of this spectrum, Arqiva cannot express a preference for which approach would be most appropriate. Whichever approach Ofcom decides to propose for these spectrum bands, it is essential that:

- potential bidders have as much certainty in advance of the auction as possible
- consideration of the approach to take does not unduly delay the auction.

*Question 18: Do you have any comments on the transmitter spectrum masks defined below?*

Not at this stage.

*Question 19: Do you have any comments on the SUR parameters defined below?*

Not at this stage.

*Question 20: Do you have any comments on the SUR methodology and assumptions detailed in this annex?*

Not at this stage.

*Question 21: Do you have any comments on the use of the Visualyse tool as described, on the assumptions or the propagation model proposed in this annex?*

No.

*Question 22: Do you have any comments on the assumptions detailed in this annex?*

No.