Response to the consultation on the

"Draft RSPG Opinion on a long-term strategy on the future use of the UHF band (470-790 MHz) in the European Union"

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RSPG consultation on the Draft RSPG Opinion on a long-term strategy on the future use of the UHF band (470-790 MHz) in the European Union

About Arqiva

Arqiva is the communications infrastructure and media services company operating at the heart of the broadcast and mobile communications industry and at the forefront of network solutions and services in an increasingly digital world. Arqiva provides much of the infrastructure behind television, radio and wireless communications in the UK and has a growing presence in Ireland, mainland Europe, the USA and Asia.

The company supports cellular, wireless broadband, satellite, video, voice and data solutions for public and private sector customers.

Arqiva is a founder member and shareholder of Freeview. Arqiva owns and operates the networks for all six of the established Freeview multiplexes and more recently has rolled out a further Freeview multiplex delivering additional high definition programmes on the platform. Of these seven multiplexes, Arqiva is the licensed operator for three of them providing access to the Digital Terrestrial Television platform for Broadcasters and content providers. Arqiva was also a key launch technology partner for Freesat. We own Connect TV, the first company to launch a live IP streaming channel on Freeview. Arqiva is also the licensed operator of Digital One – the national commercial DAB digital radio multiplex.

Arqiva is also a significant Satellite Earth Station operator in the UK, with five operational teleport sites, operating over 80 antennas to geostationary satellites over the orbital arc 61 degrees West to 68.5 degrees East. In the UK, Arqiva is a major provider of permanent satellite services to both Freesat and Sky customers, and from its UK bases and fleet of transportable and flyaway systems, provides services to a range of satellite based platform operators throughout the world. These are for both permanent services and ad-hoc services, such as the Scottish Referendum, the Olympic and Commonwealth Games etc.

We are building and running a national Internet of Things (IoT) network, starting with 10 of the UK's largest cities. In addition our smart metering communications service, connecting 10 million homes using long-range radio technology, will be one of the UK's largest machine-to-machine deployments.

Arqiva operates shared radio sites throughout the UK and Ireland including masts, towers and rooftops from under 30 to over 300 metres tall as well as a number of international satellite teleports. In Arqiva Wi-Fi we own one of the UK's largest Wi-Fi hotspot providers that enable us to build a unique proposition for Wi-Fi hotspot and outdoor Wi-Fi provision in the UK. In Arqiva Wi-Fi we work with some of the busiest and best loved brands in the UK, delivering seamless Wi-Fi connectivity for; Travelodge, Enterprise Inns and the majority of airports. Our network of access points spans over 3,000 public locations including city centres, hotels, restaurants, shopping centres, airports, motorway service stations and other premium, high-footfall locations.

Our major customers include the BBC, ITV, Channel 4, Five, BSkyB, NBCU, Turner, Classic FM, the four UK mobile operators, the Metropolitan Police, Airwave, RNLI, and satellite operators including Eutelsat, Inmarsat, SES and Intelsat.

Arqiva is owned by a consortium of long-term investors and has its headquarters in Hampshire, with major UK offices in London, Buckinghamshire and Yorkshire.

RSPG consultation on the Draft RSPG Opinion on a long-term strategy on the future use of the UHF band (470-790 MHz) in the European Union

1. Executive Summary

We are generally supportive of the draft RSPG Opinion but raise the following observations:

- The 700 MHz Clearance process will be complex for which transition planning and development of frequency plans is yet to fully begin. Until these elements are in place it will be difficult to know whether the proposed timeline set for Europe is realistic and further substantive effort is required by Member States to address this. Furthermore, we fully support the RSPG position on the need for improvements to receiver performance to minimise interference from LTE services but note that as co-existence modelling has been based on DVB-T2, in the event that Member States continue with DVB-T operation there will be an enhanced risk of interference which will need to resolved;
- With regard to future developments of DTT we see that a migration to DVB-T2 will be a key development in the move towards higher resolution content formats. In addition, many countries may need to transition to DVB-T2 to meet National regulatory obligations for content delivery;
- We welcome the position adopted to support the long term sustainability of DTT but note that the platform must be given the opportunity to develop which is incompatible with continually signalling the future end of the platform.
- We urge the RSPG, the Commission and Member States to work constructively to secure a funding arrangement that does not compromise the DTT platform during displacement of the 700 MHz band;
- The need to provide flexibility for wireless downlink services is somewhat questionable as there is no clear economic or technical case for such a migration. Furthermore there are well understood incompatibility issues with the implementation and operation of a low tower low power network adjacent to existing high tower high power services. In addition, the technology to exploit this alternative architecture has not been standardised and the purported frequency efficiency gains cannot be achieved further challenging the validity of this concept;
- The benefits of coexistence/sharing; DTT and PMSE are both high value services in the UHF band and have coexisted very effectively for many years and were PMSE forced to an alternative frequency band there would be considerable risk to audio video content creation and the economic value that the Production sector creates;
- We welcome the RSPG approach to Public Safety frequency requirements which does not support the need for harmonised and dedicated spectrum for PPDR in Europe in the UHF band.

2. Arqiva responses to the draft Opinion

2.1 Introduction

The UHF band (470 – 790 MHz), is heavily utilised in Europe by the terrestrial broadcast service. As the current use of the spectrum, these services are highly valued by EU citizen-consumers and the Commission is duty bound to afford due protection of the consumer benefits that accrue. To this end we are encouraged by the *Draft RSPG Opinion on a long-term strategy on the future use of the UHF band* and are generally supportive but would note a number of issues with the RSPG Opinion as currently drafted. These points are set out in detail below.

2.2 The 700 MHz clearance process

We recognise the International momentum behind a future clearance of the 700 MHz band but also note the complexity and challenges associated with reorganising the DTT networks across Europe to accommodate today's services in less spectrum than is currently utilised. In addition we note that clearance of the band across Europe will be an involved process for which the detailed planning is still to commence and moreover, the frequency plans on which any transition will be based are in the very early stages of development. As such, the dates proposed for a full clearance of the 700 MHz band in Europe may be appropriate but without robust plans in place that have been stress tested, it is difficult to conclude whether the timeframes proposed are appropriate.

2.2.1 International coordination timing

The Radio Spectrum Policy Group (RSPG) has estimated that coordination required in the case of clearing the 700 MHz band would take more than 3 years[1]. Whilst this process is already underway it is not obvious that there is a clear timetable that delivers the internationally coordinated frequency plans that will be necessary to allow financial commitments for 700 clearance to be made. The key aspects that need to be addressed are as follows:

Member State activities

- Optimising DTT platform in a post 700 cleared World for each member state
- Consider frequency availability against existing international agreements taking account of existing international rights
- Evaluation of DTT network infrastructure issues/challenges

International negotiations

- Bi-lateral/multi-lateral frequency rights exchange
- Negotiation with third party countries
- Revised International Agreements

It is worth noting that this is an iterative process that will require ongoing dialogue and refinement of member states frequency plans before the final plan is adopted. In order to effect early investment in the DTT infrastructure, Member States will need to achieve international agreements to a degree that will allow funding to proceed at minimal risk and this will need to happen in advance of a full international agreement. Finally, it is unclear how the legal rights captured within the GE06 plan will be replaced by an equivalent binding plan that delivers 700 MHz clearance across Europe.

[1] RSPG Report on proposed spectrum coordination approach for broadcasting in the case of a reallocation of the 700 MHz band"**,** section 4.1, the third paragraph.

2.2.2 Clearance timing

For the UK, Ofcom have stated that completion of 700 MHz clearance by the end of 2021 is possible. This would suggest that 2022 would be an acceptable date for completion of clearance across Europe. However, the UK potentially has greater flexibility than countries in central and Eastern Europe where frequency availability will be more challenging and the international negotiations more complex. Furthermore, in the event that member states are required to undertake a technology upgrade to DVB-T2 on the DTT platform alongside the clearance process to secure regulatory and consumer demands, this may have a profound impact on the timing of 700 MHz clearance.

In order to determine the appropriate clearance completion date for Europe, a detailed evaluation of the critical aspects of the clearance process is necessary. To this end we consider that Annexe 2 of the recently published Lamy report[2] provides clear and robust guidance on which to determine the end date for the 700 MHZ clearance programme across Europe.

2.3 Future developments of DTT

The displacement of DTT services from the 700 MHz band will leave DTT with reduced access to spectrum than it currently depends on. Furthermore, the loss of these frequencies will limit the flexibility that the platform has for future enhancements such as technical upgrades to expand the availability of HD services and ultimately enable ultra HD channels. It may be essential for the platform in each EU member state to convert to DVB-T2 if the network concerned has not already done so particularly in light of the findings from the Analysys-Mason study[3] which emphasised the future spectrum demands for the terrestrial platform in Europe.

An obvious time to implement the migration to DVB-T2 would be to make it coincident with the clearance of the 700 MHz band. Whilst this is most desirable it may be complicated given the likely scale of legacy domestic receiver equipment still in service at the time of clearance. In the event that a technical upgrade to the DTT platforms is necessary, in order to sustain the long term viability and also to facilitate the clearance solutions of member states, the RSPG recommends that the European Commission should, in cooperation with Member States support national measures to facilitate transition to more spectrum efficient technology, including those mandating the inclusion of such technologies in the TV receivers. We fully endorse this position.

Finally, in regard to improved receiver performance, we support this as it is critical to minimise any disruption caused by LTE systems deployed in the 700 MHz band.

2.4 Long term sustainability of DTT

We welcome the position adopted by the RSPG but note that in the event that DTT is given sufficient opportunity to develop and continue to be the European citizens preferred platform for all audio visual content delivery then it would be inappropriate to signal a future end date for DTT particularly as this would undermine future investment in the platform.

From the work of the High Level Group, Lamy[4] recognised the long term need for DTT and concluded 'Reassurance should be given to terrestrial broadcasting for a next cycle of investments. This is linked to safeguards for access to spectrum below 700 MHz until **2030**'.

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[2] Pascal Lamy, Report to the European Commission; Results of the work of the high level group on the future use of the UHF band (470-790 MHz), 1 September 2014

[3] Spectrum Policy, Analysis of technology trends, future needs and demand for spectrum in line with Art.9 of the RSPP, http://ec.europa.eu/information_society/newsroom/cf/dae/document.cfm?doc_id=2881

[4] Pascal Lamy, Report to the European Commission; Results of the work of the high level group on the future use of the UHF band (470-790 MHz), 1 September 2014

Ofcom in its discussion document on the future of free to view TV[5] stated that it did not currently expect a full switch-off of DTT until post 2030.

In addition, a study recently undertaken by Aetha[6] considered the economic value of mobile use of the spectrum below 700 MHz. It concluded that the economic benefits for the EU are maximised if the sub 700 MHz UHF Broadcast band continues to be used for DTT for at least the next 15 years. It went on to state that there was clearly no economic case for switching-off existing DTT networks across Europe on the grounds of spectral efficiency.

We support the approach proposed by the RSPG as it will secure access to the 470 – 694 MHz range post WRC-15. However, if the objective is to provide long term security and sustainability for DTT and the priority actions are designed to secure this outcome, then it would seem inappropriate to postulate a future date for the cessation of the DTT platform and the highly valued services that it delivers.

Finally, we encourage the RSPG, Commission and member states to work constructively to secure a funding arrangement that does not compromise the DTT platform during any displacement of the 700 MHz band. Such an arrangement should ensure that DTT community including consumers should be left no worse off than they would have been absent any 700MHz clearance. Moreover, in the event of 700MHz clearance, broadcasters, multiplex operators and consumers should not incur any additional costs that arise from this process.

2.5 Flexibility for wireless downlink services

The need to provide flexibility for wireless downlink services is somewhat questionable as there is no clear economic or technical case for such a migration. Furthermore there are well understood incompatibility issues with the implementation and operation of a low tower low power network adjacent to an existing high tower high power service. The technology to efficiently exploit this type of architecture has not been standardised and moreover the purported frequency efficiency gains cannot be achieved negatively impacting the validity of this concept.

Plum Consulting, on behalf of the European Commission, has undertaken a detailed study programme involving industry stakeholders to consider the 'challenges and opportunities of broadcast-broadband convergence in the UHF band.'

The latest findings[7] from their work emphasise the complexity and cost of the displacement of the incumbent High Tower DTT service with a Low Tower / Low Power converged broadcast alternative – noting a significant increase in cost with no obvious benefits of such a change.

In addition, the ECC Report 224, the product of a detailed joint study group involving European administrations and Industry stakeholders found no compelling driver for downlink only services and clearly demonstrated the sustained importance of DTT to the European media landscape and hence the need to secure long term access to this spectrum for DTT. Furthermore, the study group found that the technology to support downlink only services on a wide spread basis had not been developed nor standardised.

Finally, as noted in section 2.4 above Aetha's recent study concludes that DTT's continued access to the 470 – 694 MHz band has more profound economic impact than the use of this spectrum for Wireless Broadband services. The economic analysis showed that for the period 2015 – 2029 the DTT service generated four times the economic benefit of Wireless Broadband use of the same frequency range (even with the most aggressive mobile traffic forecasts).

[5] The Future of Free TV, a discussion document; Ofcom, 28 May 2014
[6] Future use of the 470–694MHz band, Aetha report, 31 October 2014
[7] Challenges and opportunities of broadband-broadcast convergence - The economic costs and benefits of a converged platform, EU Convergence study, Second Stakeholder workshop, 8 July 2014

2.6 Coexistence / sharing with other high value spectrum users

DTT and PMSE have had an effective and successful coexistence arrangement for many years. As such the PMSE community has to be given security of access to spectrum and appropriate assurances for at least the same timeframe as DTT. Were PMSE to be moved to an alternative frequency band there would be considerable risk to the audio visual content creation sector, a driver of high economic value creation and employment.

In summary, the cultural, creative and media industries are an essential pillar of the digital economy and one of the key assets of Europe with these industries:

- Accounting for 6.8% share of GDP (€860 billion) and 6.5% of Europe's employment (approximately 14 million direct and indirect jobs), according to the TERA report[8;]
- Creating and investing in digital platforms, Europe's digital market for cultural products and services are providing more and more choice to consumers despite enduring a huge and unfair competitive pressure from illegal or unregulated services that destroy jobs and investment opportunities;
- Combining the forces of large and successful European-based companies competing in a global market alongside +1.4 million small and medium sized enterprises[9] (responsible for over 80% of generated revenue) which tie together European territories and are deeply rooted within local economies and national cultures. They employ a highly skilled, non off-shorable and well-educated workforce;
- Including small, medium and large entities - employers and workers - that jointly constitute the flagship and the backbone of creative industries in Europe. Together they stand at the forefront of Europe's fresh start to provide more jobs for European citizens.

2.7 Public Safety frequency requirements

We welcome the RSPG approach which does not support the need for harmonised and dedicated spectrum for Public Protection and Disaster Relief (PPDR) in Europe as the introduction of PPDR services into the 700 MHz guard band is incompatible with the protection of Broadcast services in channel 48 and below and is hence incompatible with the objectives set-out in Agenda Item 1.2 of WRC12[10].

2.8 Wireless Broadband traffic demand forecasts

It has been recognised that a significant proportion of 'mobile' data consumption is static and facilitated by traffic offload on to Wi-Fi[11] somewhat questioning the need for additional sub-1GHz spectrum for Mobile Networks. Moreover, the expansion of the use of small cells or network densification in the Mobile Networks to increase data capacity is better addressed by access to higher frequency spectrum whether the user equipment is static or mobile.

[8] Laurent Benzoni and Philippe Hardouin, The economic contribution of the creative industries to EU GDP and employment - Evolution 2008-2011, Paris, September 2014

[9] sic

[10] WRC-12, Resolution 232, Final Acts, Geneva 2012, http://www.itu.int/dms_pub/itu-r/opb/act/R-ACT-WRC.9-2012-PDF-E.pdf

[11] Wik/Aegis, Study on Impact of traffic off-loading and related technological trends on the demand for wireless broadband spectrum, http://bookshop.europa.eu/en/study-on-impact-of-traffic-off-loading-and-related-technological-trends-on-the-demand-for-wireless-broadband-spectrum-pbKK0113239/

Mobile data demand forecasts are also inherently uncertain and caution should be exercised when taking regulatory action which relies upon them. This is particularly the case where the acknowledged leader in the field of mobile data demand forecasts, Cisco, has twice reduced its mobile data forecasts. Furthermore, the adjusted estimates were challenged by another recognised authority in this field, Analysys Mason, as still significantly overstating the likely level of future data demand.

In addition, the reliability and accuracy of wireless data demand projections was recently the subject of a paper[12] presented at the 42nd Research Conference on Communication Information and Internet Policy in Washington DC. The paper reviewed the accuracy of previous projections of wireless demand and considered the spread of under to over estimates produced. It was noted in the paper that for the past seven Cisco mobile traffic forecasts for North America, overestimates were nearly twice as frequent as underestimates (19 vs. 10). Overestimates were also on average, greater in magnitude than the underestimates (103 vs. 81 PB/month).

As this information suggests, there is growing evidence that mobile data demand forecasts are significantly overstated. Furthermore, the basis for the data growth estimates for mobile has been questioned as the base assumptions for population density is two orders of magnitude too high[13]. Hence, the high data capacity growth projections for mobile will have to be significantly downgraded and regulatory policy adjusted accordingly.

In the preparations for WRC-15, future agenda items for 5G technology are focusing on frequencies above 6 GHz to address the anticipated need for high bandwidth applications. It is anticipated that 5G will be a technology platform that serves a diverse range of applications and contexts utilising higher frequencies further challenging the need for additional low frequency spectrum.

2.9 Compensation

Arqiva notes the RSPG recommends that the commission assist the 700 MHz transition by providing early guidance to the relevant Member States, in particular clarifying cases where it would not be compatible with state aid rules. However, in order to achieve an effective and timely displacement of DTT services from the 700 MHz band in Europe it is important to secure a funding arrangement that does not compromise the DTT platform during any displacement of the 700 MHz band. Such an arrangement should ensure that the DTT community including consumers would be left no worse off than they would have been absent any 700MHz clearance. In addition, in the event of 700MHz clearance, broadcasters, multiplex operators and consumers should not incur any additional costs that arise from this process. We encourage the RSPG and the Commission to engage actively with this issue and provide adequate guidance as soon as possible.

3. Corrections / challenges to statements made

3.1 The role of DTT platform for citizens and delivering general interest objectives

As noted in section 4.1.2 of the RSPG Opinion;

“DTT plays an important role for European citizens and has high cultural and social value, especially for those EU member states that rely mostly on DTT platform”.

In addition, ECC report 224[14] section 3.3.3 notes;

[12] ‘Overestimating wireless demand: policy and investment implications of upward bias in mobile data forecasts,’ presented at 42nd Research Conference on Communication, Information and Internet Policy, Washington DC, 13 September 2014

[13] Review of spectrum requirements for IMT, ITU Radiocommunications Study Groups, Document 4-5-6-7 / 573 E, submitted 13 February 2014, WRC-15 Agenda item 1.1.

[14] ECC Report 224, Long Term Vision for the UHF broadcasting band, Approved 28 November 2014.

"Terrestrial TV in the UHF band is currently essential in fulfilling the national and European audiovisual policy objectives such as social cohesion, media pluralism and cultural diversity. This is achieved in particular through the free-to-air model that supports a dual system where Public Service Broadcasting co-exists with commercial TV providers".

Furthermore ECC report 224 states;

"In many CEPT countries the terrestrial broadcast platform is the primary means of delivering broadcast services. The terrestrial broadcast coverage often exceeds 98% of the population and free-to-air access to Public Service Broadcasting is mandatory. Indeed, in many countries there is a deep-rooted expectation by the members of the public that free-to-air broadcast services are universally available via terrestrial networks.

Even in countries where cable, satellite or broadband platforms hold a significant market share, terrestrial broadcasting is regarded, alongside these other platforms, as an essential, flexible, reliable and cost-effective way of delivering broadcast content to a mass audience. This is facilitated by the fact that most European households are suitably equipped to receive free-to-air radio and television services without any subscription. The terrestrial platform has the largest base of installed receivers and is the principal broadcast platform for free-to-air services to be delivered with universal reach. According to the Eurobarometer 396[15] around 46% of the EU households in 2013 rely on the terrestrial broadcast networks for receiving TV services".

Finally, as noted in section 2.4 the findings of a recent economic appraisal by Aetha[16] of the future economic value of the 470 – 694 MHz band demonstrates the long term economic benefit of this frequency range in Europe for DTT relative to the alternative use by Wireless Broadband. The report found that the costs of clearing DTT from the spectrum (EUR38.5bn) significantly outweighed the potential value of using the spectrum for mobile (EUR10.3bn) by a factor of almost four. As a result it concluded that there was no economic case for switching-off existing DTT networks across Europe on the grounds of spectral efficiency.

On the basis of the above terrestrial broadcasting has a strategically important role in Europe which has been acknowledged by the RSPG in its draft opinion preparing for WRC-15 where they propose under Agenda Item 1.1;

'support no mobile allocation in the band 470 – 694 MHz'

Arqiva encourage the RSPG and the European Commission to further acknowledge the key strategic importance of terrestrial broadcasting to the Digital Economy of Europe by linking security of access to spectrum for DTT within the future Radio Spectrum Policy Programme.

3.2 Reception characteristics

Section 4.1.2 of the RSPG Opinion states:

"DTT free-to-air content can be received without any contract with a service provider or platform operator and without requiring a reverse channel. It can be accessed by -often already existing- roof-top antenna systems or through portable reception in reduced coverage areas around the transmitter sites using widely available receivers based on DVB-T/DVB-T2 standards"

[15] Special Eurobarometer 396 - e-Communications Household Survey, August 2013 (http://ec.europa.eu/digital-agenda/en/news/special-eurobarometer-396-e-communications-household-survey)

[16] Future use of the 470–694MHz band, Aetha report, 31 October 2014

It is important to note that rather than set top reception being the exception in terms of service availability within DTT networks, Set top reception is in many cases widely available, in the UK for example, 75% of households are able to receive DTT services via a set top antenna. Furthermore some network configurations are designed specifically to deliver to set top antennas, e.g. Germany and Austria.