

## **Radio Spectrum Policy Group Consultation**

### **British Entertainment Industry Radio Group (BEIRG)**

#### ***Ofcom Draft Annual Plan 2015/2016***

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#### **Executive Summary**

- BEIRG welcomes the increased focus on PMSE users set out in the consultation document, but remains concerned that the interests of Mobile Network Operators are still causing Ofcom to treat PMSE users as a mere afterthought when considering spectrum allocations, to the severe detriment of incumbent users.

- BEIRG asks Ofcom to commit to the identification of dedicated, clean alternative spectrum and to do so before the reallocation process of the 700 MHz frequency band proceeds further.
- BEIRG urges Ofcom to consider the fact that, if PMSE users are not allocated alternative spectrum, investment in the sector and the ability to enable high quality performances will be seriously affected.
- BEIRG believes that estimates for future mobile broadband demand are unreliable. MNOs already have access to enough spectrum to satisfy their customers' demands. BEIRG believes that, if MNOs are permitted and encouraged to use their existing spectrum holdings more efficiently, capacity would be sufficient to meet current and future demand.
- BEIRG requests that Ofcom undertake an independent analysis of projected mobile data demand in 2020. Furthermore, BEIRG calls upon Ofcom to undertake an independent review of the efficiency with which MNOs utilise the spectrum to which they currently have access.
- BEIRG supports Ofcom's ongoing research into the Internet of Things, but asks that spectrum is allocated with great care to ensure that there will be no disruption to the work of incumbent users. BEIRG suggests that Ofcom consider the idea that WiFi will play a significant role in the future of the IoT.

## **Introduction**

BEIRG welcomes the emphasis placed on the importance of the Programme Making and Special Events (PMSE) sector in the draft Ofcom Annual Plan for 2015/16. By making the ongoing review of spectrum access for audio PMSE applications a 'significant work area' for the upcoming year, Ofcom demonstrates an awareness of how important the sector is, and that its needs should be addressed.

However, BEIRG remains concerned that Ofcom's priority continues to be the enabling of new technology and the transfer of additional spectrum for use by Mobile Network Operators (MNOs); BEIRG thinks that Ofcom persists in only considering the practical requirements of PMSE users as an afterthought. This point of view has seriously damaged our industry in the past and, should it continue, will have serious consequences. BEIRG asks that Ofcom makes a definitive commitment to allocating clean, dedicated alternative radio spectrum to the PMSE sector before additional spectrum is allocated to MNOs therefore relieving the crippling uncertainty now affecting our sector.

## **Reallocation of the 700 MHz frequency band and the need for alternative spectrum**

BEIRG is disappointed with Ofcom's intention to proceed with the reallocation of the 700 MHz band; such a move will seriously damage the PMSE sector. BEIRG remains convinced that Ofcom's priority should be the incumbent users of this spectrum, and therefore to finding PMSE users the alternative spectrum which their needs demand.

It is essential to recognise that the reallocation of the 700 MHz, and the subsequent impingement on PMSE spectrum usage, is a serious threat to the revenue generation of the sector. Industry users will be directly affected and face a huge potential loss of earnings and consumer reputation. In any

production **uninterrupted, high quality** audio is absolutely critical. Consequently, any interference experienced that causes a degradation of audio quality has severe repercussions for both the production and the audience alike.

Unlike other technologies, wireless microphones do not have the capability to move to platforms other than radio spectrum. Whereas currently terrestrial television services may potentially be able to be broadcast online in the longer-term, PMSE equipment cannot function on any platform other than clean, interference-free spectrum. Currently there is only a limited pool of PMSE equipment that operates outside the UHF spectrum; the UHF bands offer the largest quantity of contiguous, good quality spectrum required for large professional events. This is not the case for other “usable” blocks of spectrum like 1.8GHz, 2.4GHz, or even 5GHz, for which some manufacturers make a small amount of equipment. Furthermore, interference from Digital Terrestrial Television (DTT) in the UHF bands is predictable and can be accounted for, while in other parts of spectrum where radio mics can operate, PMSE users must share spectrum with license exempt devices and find that access can therefore be much more unreliable and of inconsistent quality.

BEIRG welcomes Ofcom’s offer to continue its engagement with stakeholders in order to address the specific needs of PMSE. Its promise to ‘aim to ensure that PMSE users have access to the spectrum they need to continue staging [their] events without materially compromising production values’<sup>1</sup> is a significant step towards a viable future for PMSE. However, it is not enough: as the deadline for the 700 MHz reallocation moves closer, BEIRG urges Ofcom to finalise identification of high quality, clean alternative spectrum for the PMSE sector.

Until alternative spectrum is identified and allocated, PMSE manufacturers cannot begin research and development into new equipment designed to work at these alternative frequencies. There is, obviously, a time lag between spectrum being identified and suitable equipment being made available. The PMSE sector requires a period of years between spectrum access being allocated and migration in order for suitable equipment to reach the market. This raises the prospect of there being a period of time during which PMSE users have access to a new set of frequencies, but not to equipment which operates at those frequencies. Manufacturers will not produce suitable equipment capable of tuning to any alternative bands until those alternative bands are clearly identified and long-term access is guaranteed.

## **Future Mobile Demand**

BEIRG remains unconvinced of the accuracy of predictions for increased future mobile data demand. If the projected rates of demand are indeed flawed, then the reallocation of the 700 MHz frequency band is unnecessary. Before any further disruptions are made to radio spectrum distribution, BEIRG asks that Ofcom commission a fully independent study into future mobile data demand. There are strong suggestions that reports which have previously been relied upon have been shown to be seriously flawed.

For example, ‘Overestimating Wireless Demand: Policy and Investment Implications of Upward Bias in Mobile Data Forecasts’, a report authored by Aalok Mehta and J. Armand Musey (August 2014),

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<sup>1</sup> *Ofcom Draft Annual Plan 2015/16*, <http://stakeholders.ofcom.org.uk/consultations/draft-ann-plan-15-16/>, December 2014, p. 30

found that ‘regulators have come to rely on reports that have repeatedly proven to be inaccurate, and have taken few measures to adjust policies or mitigate the risk of error going forward’<sup>2</sup>.

The report cites several examples of faulty data being used by regulators, including Ofcom. It notes that, in the *Real Wireless* spectrum demand forecast (June 2013), a prediction of a demand of 10petabytes per square kilometre by 2020 was made. This figure was heavily criticised and the forecast was later revised downward by a factor of 1,000 to 10 terabytes per square kilometre in the final version of the report (March 2014). This alteration, although never explained, demonstrates the inherent uncertainty of spectrum predictions.

The report lists several possible causes of bias, such as a refusal to take into account the increasing popularity and ease of Wi-Fi deployment or an inability to predict business and product developments. For example, Mehta and Musey point out that modelling often does not take into account that the price per MB will undoubtedly shift over time; consumers will not increase their data usage several times over if it remains at its current price.

The commercial value of spectrum, the report suggests, means that MNOs should shoulder the burden of proof in this scenario. Mehta and Musey admit that prediction data is likely to remain a key feature of spectrum policy, despite its questionable validity. They suggest that regulators should demand higher standards of submitted evidence and, most importantly, admit when a figure is doubted – presentation of the theoretical as fact has already had a damaging and distorting effect.

Likewise, the European Broadcasting Union has cast doubt on the projections used by regulators. It believes that current models offered by ITU-R SG 5D overestimate mobile traffic density in 2020 by a magnitude of two orders - a factor of one hundred<sup>3</sup>.

BEIRG has long argued that the data which administrations rely upon is far from definitive. And yet it is these predictions that have been used to justify the continual erosion of the PMSE sector’s access to spectrum. As the quantity and quality of spectrum available diminishes, the quality of production within the PMSE sector, and its contribution to the UK economy, will also be diminished. As Mehta and Musey state, ‘Government agencies... have a strong obligation to manage spectrum as efficiently as possible due to its zero-sum nature and public ownership’.

BEIRG thinks that if MNOs were made to use their current spectrum more efficiently there would be less, or potentially no need, to allocate them additional spectrum. The past actions of extending mobile broadband spectrum access, without supporting or demanding the reuse of existing resources, have not encouraged sufficient efficiency amongst the mobile telephone industry. Whilst PMSE is an efficient user of spectrum, able to utilise interleaved spectrum and to operate alongside other users such as DTT, mobile telephone technology is, at present, not and is unable to coexist with other users.

Additional spectrum should only be allocated for use by MNOs once they have shown that they have made efficient use of their current spectrum and their need for additional spectrum has been

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<sup>2</sup> Aalok Mehta and J. Armand Musey, *Overestimating Wireless Demand: Policy and Investment Implications of Upward Bias in Mobile Data Forecasts*, August 2014.

<sup>3</sup> European Broadcasting Union, Spectrum Factsheet, <http://www3.ebu.ch/files/live/sites/ebu/files/Knowledge/Publication%20Library/Fact%20sheets/Fact%20sheet%20-%202014-07%20Spectrum.pdf>, July 2014.

confirmed by critical, independent analysis. Currently, BEIRG does not believe that MNOs have made a convincing case in this regard. Much more efficient and cost-effective use could be made of this spectrum, and it is therefore imperative that mobile telephone companies make the most of their large spectrum holdings, as meeting any likely future demand will be greatly dependent on this. The outcome of a re-farming effort by the mobile companies should be modelled and they should be made to comply with this to ensure the greatest possible level of spectral efficiency.

The increasing complexity of handsets has already led to a steady decline in mobile handset radio performance, which in turn leads to an increase in the required number of base stations to maintain network coverage<sup>4</sup>. The addition of further complexity to mobile handsets (and/or other mobile network user equipment such as dongles and tablet computers) will not promote spectral efficiency. BEIRG believes that MNOs should be encouraged to exclude poor performing handsets from their networks.

Ofcom has already identified several ways by which MNOs could increase their mobile data capacity. MNOs should be required to employ these options before, **not after**, they are allocated additional spectrum. A mobile telephone industry that in general refuses, for example, to share network infrastructure resources such as masts, clearly has more interest in its market penetration than in the efficient use of spectrum.

Mobile users already offload onto Wi-Fi to make voice calls and to send and receive data in an already overloaded SRD Band. As a more efficient, reliable and better quality means of data transfer, this raises the question of how much more spectrum the mobile community actually needs in future. The future may see most consumers offloading services onto Wi-Fi, as a preference to mobile broadband, especially with increasing amounts of people working from home. Use of Wi-Fi could allow for a much larger capacity and faster throughput of data. This offloading of voice calls and data is not accurately reflected in predictions for future data use.

It should also be noted that mobile broadband is only one mechanism for data delivery; one which cannot deliver the benefits of a wired connection. Ofcom should encourage the use of wired Wi-Fi systems to facilitate data delivery wherever possible. While there is a difference in relative costs, the life of a wired network is 30-50 years, compared to 10-15 years for wireless. Spectral efficiency should be Ofcom's primary focus in this area, and a focus on Wi-Fi provision to provide data access would help to relieve a great burden on spectrum use, therefore allowing PMSE to continue operating at its current level.

### **The Internet of Things**

BEIRG urges Ofcom to be careful in its analysis of spectrum for use by the Internet of Things (IoT). Ofcom's contention that there will be enough spectrum available for the next five years of IoT development is likely to be correct, because there is enough spectrum within existing M2M and WiFi bands to accommodate the IoT. However, BEIRG remains concerned that Ofcom will further encroach on the spectrum available to PMSE users in order to facilitate the future of the IoT. The nature of the IoT would make any such infringement completely unnecessary.

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<sup>4</sup> Eurexcm Engineering, *Study for the European Commission – Enterprise and Industry Directorate General: Technical support relating to performance of antennas of mobile phones, Final Report, January 2014*

The website CBROnline recently reported that research from Goldman Sachs has suggested that Wi-Fi will become the dominant wireless access technology for the IoT. Goldman Sachs reported that 70% of respondents to a survey by VDC Research stated that Wi-Fi would be the dominant technology<sup>5</sup>. CBROnline also reported, in May, comments from Neul that 4G technologies such as LTE will struggle to play a meaningful role in the IoT<sup>6</sup>. In light of this, BEIRG suggests that developers of M2M devices for the IoT should be required to make optimum use of those bands already available to these applications. Second, if additional spectrum is needed for the IoT, devices should operate in existing Wi-Fi bands such as the 2.4 GHz and 5 GHz bands. It should also be noted that the majority of devices connected to the IoT will be transmitting small amounts of data, and will be doing so infrequently, meaning that there should be enough capacity within the WiFi and M2M bands to accommodate the IoT. In addition, any dedicated bands for M2M or IoT devices will invariably provide a better quality of service than any shared bands; especially if they are licensed or at least managed.

The IoT relies heavily on the use of White Space Devices (WSDs), which could prove to be extremely disruptive to PMSE users; BEIRG urges Ofcom to enter into further study of the effects of this technology. Although BEIRG is pleased with the results of the 2014 WSD testing of 2014, the tests were not representative of a real-world scenario as they did not use multiple devices. Ofcom has no data to identify the effects of thousands of WSDs operating in close proximity to each other and to wireless audio devices. BEIRG welcomes Ofcom's previous work in this area, but asks that more be done to fully understand the nature of the evolving IoT and the reality of WSD intermodulation.

## **Conclusion**

BEIRG welcomes Ofcom's markedly increased engagement with the PMSE community, and that the Annual Plan 2015/16 consultation includes a significant acknowledgement of the importance of our sector. However, diminished spectrum access has already had a seriously damaging effect on the creative industry; BEIRG asks Ofcom to commit to the identification of alternative high quality spectrum before the reallocation of the 700 MHz frequency band makes it impossible for our work to continue.

## **British Entertainment Industry Radio Group**

The British Entertainment Industry Radio Group (BEIRG) is an independent, not-for-profit organisation that works for the benefit of all those who produce, distribute and ultimately consume content made using radio spectrum in the UK. Venues and productions that depend on radio spectrum include TV, film, sport, theatre, churches, schools, live music, newsgathering, political and corporate events, and many others. BEIRG campaigns for the maintenance of 'Programme Making and Special Events' (PMSE) access to sufficient quantity of interference-free spectrum for use by wireless production tools such as wireless microphones and wireless in-ear monitor (IEM) systems.

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<sup>5</sup> CBROnline, "Wi-Fi, Not Cellular, To Lay The Foundation For The Internet Of Things", <http://www.cbronline.com/news/mobile-and-tablets/wi-fi-not-cellular-to-lay-the-foundation-for-the-internet-of-things-4307312>, July 2014

<sup>6</sup> CBROnline, "Internet of Things can't be built on LTE", <http://www.cbronline.com/news/internet-of-things-cant-be-built-on-lte-4263590>, May 2014.

As well as being vital in producing live content, wireless PMSE technologies play a key role in helping to improve security and safety levels within the entertainment industry and other sectors. Their benefits include improving the management of electrical safety, the reduction of noise levels, the development of safety in communications and reducing trip hazards as well as providing an essential tool for the security orientated services. Wireless equipment and the spectrum it operates in are now crucial to the British entertainment industry.

BEIRG is a member of the Association of Professional Wireless Production Technologies (APWPT)<sup>7</sup>, which promotes on an international level the efficient and demand-driven provision and use of production frequencies for professional event productions, as well as safeguarding such production frequencies for the users on the long run.

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<sup>7</sup> <http://www.apwpt.org/>