BEIRG
BRITISH ENTERTAINMENT INDUSTRY RADIO GROUP

Ofcom Consultation

British Entertainment Industry Radio Group (BEIRG)

Future demand for mobile broadband spectrum and consideration of potential candidate bands

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British Entertainment Industry Radio Group

Response to Ofcom consultation "Future demand for mobile broadband spectrum and consideration of potential candidate bands"

BEIRG is not in favour of allocating any more spectrum for mobile broadband at this time.

Instead, we believe that obtaining a better understanding of what spectrum is currently being utilised by mobile network operators, and how it could be used more efficiently to meet demand through refarming, would be far more constructive. Constant speculation and consultation continually undermines both the Programme Making and Special Events (PMSE) industry and business. This is economically damaging. BEIRG calls on Ofcom to urgently determine and secure a long term plan for the industry, which protects the long-term future of PMSE in the UK, and will help our sector to invest and to grow.

Economics of PMSE

The economic and social importance of PMSE, and the creative industries which rely on it, is growing. In the UK the creative industries are currently responsible for 1.5 million jobs, and contribute £36 billion annually to the UK economy. PMSE services contribute significantly to the economic and social wellbeing of the UK. For example, the West End of London, which uses PMSE equipment to produce much of its content, attracts visitors from all over Britain and tourists from across the world. The current estimated annual turnover of the West End is £500 million, and it receives around 15 million visitors a year. Including downstream revenue such as merchandise, the estimated economic impact is £1.5 billion. Similarly, music festivals and live music concerts also contribute a significant amount to the British economy.

While PMSE is growing in size and importance, the access to spectrum which is vital to its operations is being eroded. Without sufficient access to spectrum, the PMSE sector's ability to produce content for consumers is severely hindered. It is essential to recognise that any interference to PMSE usage poses a serious risk to the revenue generation of this sector. As interference affects PMSE content production at its live source, industry users will be directly affected and face a huge potential loss of earnings and consumer reputation. In any production uninterrupted audio is **absolutely critical**. Consequently, any interference experienced that causes a wireless audio failure has severe repercussions for both the production and the audience alike. There is therefore a need for new services to recognise, respect and co-exist with PMSE users, as well as to make the most of the spectrum that they have, to ensure fair usage for all.

The PMSE industry in the UK has already faced serious upheaval over the past decade. The clearance of the 600 MHz and 800MHz bands has placed a serious financial burden on the industry. The threat of interference from unlicensed White Space Devices (which would compete with cognitive systems for PMSE) and the proposed clearance of the 700MHz band, are providing further concern for PMSE professionals and undermining investor confidence. At the same time, consumer demand for PMSE produced content is rising. BEIRG believes there will soon be insufficient spectrum available to operate necessary quantities of PMSE equipment for large-scale musical productions to be staged at certain prime venues across the UK.

PMSE Spectrum Requirements

Unlike other technologies, wireless microphones do not have the capability to move to platforms other than radio spectrum. Whereas television broadcasts 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 TV 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 be much more unreliable and of a poorer quality.

While BEIRG recognises that mobile broadband may bring benefits to consumers in the future, this should not be at cost to other industries reliant on spectrum such as PMSE. The impact on these industries will outweigh those benefits to citizens and consumers. Demand for spectrum in the UK is extremely high, and growing. Upwards of 90,000 requests for PMSE spectrum access are made to the licencing band manager in the UK each year. Any changes to spectrum allocation which will affect the ability of these industries to operate risk diminishing their contribution to society, and reduce their capability to provide a range of benefits to consumers.

PMSE Clearance

We do not accept that the 700 MHz band needs to be cleared for the purposes of wireless broadband. No formal decisions were reached at WRC-12 with regard to the future of this band, and BEIRG does not believe that widespread spectrum clearances should be undertaken. It is important that mobile companies make better use of their existing spectrum resources for mobile broadband before being assigned any new bands. Given the large quantity of spectrum available to mobile services, and the limited access which PMSE already has, no decision should be made on 700MHz until mobile services can prove to be making the most efficient use of their available spectrum. It should be possible for mobile companies to ensure adequate mobile broadband coverage with the level of spectrum access that they currently enjoy. Additional spectrum allocation for mobile broadband would therefore not be needed at this time. We are concerned that the mobile companies have so far not best utilised their current spectrum allocation and that much more efficient use could be made of this limited resource.

Future disruption to the industry, and the spectrum to which it has access, is threatening its ability to continue to produce the world class content which is screened and exported throughout the world. This is in the interest of neither citizens, nor consumers, and BEIRG believes that Ofcom has a responsibility to ensure that the PMSE industry does not suffer interference or clearance as a consequence of any new mobile services.

PMSE Equipment

Due to the relatively limited tuning ranges of PMSE equipment access to contiguous bands of spectrum is very important for flexibility as well as quality of PMSE. Regional variation in spectrum use causes changing requirements for PMSE which must adapt to local availability. Putting more pressure on PMSE through an

ever-decreasing amount of spectrum will be highly damaging for the long-term benefits that could be gained from UHF Bands IV and V through good management.

The development of PMSE equipment designed to deal with increasing spectrum congestion would, as a result, be far more expensive, as it needs to be able to exploit more efficiently what spectrum remains in the UHF bands. This will be detrimental to the industry. Our industry must have stability in its access to spectrum, and the continuing industry uncertainty over what will be needed in future is impacting on both equipment sales and business. Ofcom must work to ensure that the least possible disruption is caused to PMSE services and operators. If further clearances were put into place, the PMSE sector would require a formal compensation scheme. Being allowed only a short few years of use from new equipment, before fresh purchases must be made as a result of spectrum clearance, is not feasible for the sector; the industry typically gets between fifteen and twenty years of use out of professional equipment. Given that many members of the PMSE industry have only recently purchased equipment which operates in the 700 MHz band to replace that which operated in 800 MHz, BEIRG is greatly concerned with the potential financial loss now facing the sector.

Question Responses

Question 1: How much do you expect UK mobile data demand to change in the period 2015-2030? Please provide evidence for the trend and, where possible, please indicate how demand might vary across the device categories listed in paragraph 4.7. How should we account for factors (including pricing) that would constrain demand?

BEIRG believes that the definition of 'data' in this context needs to be more closely outlined, for the industry to be able to better answer this question. LTE treats voice as data, which distorts the overall picture of demand somewhat. We are not convinced that demand will necessarily increase exponentially, as EE's rollout of 4G has shown that the cost of access is too great, and the quality of data is not as high as that received over Wi-Fi. Neither can this be ascribed to a current lack of market competition – the picture from South Korea is that the cost of 4G is too great for consumers, despite unprecedented demand for data.[1] The use of data will therefore be directly affected by its costs and the quality received by customers.

In the future, we expect that quantities of video and audio data consumption will increase on mobiles, particularly through Wi-Fi, which will be fuelled by PMSE. Audio-visual content production will therefore be harmed if PMSE is increasingly constrained by ever decreasing spectrum access and interference. A balance must be struck between mobile data demand, and content production. PMSE, as a growing industry, must be allowed to continue uninhibited. Without it, audio-visual mobile content will decline in quantity and quality, no matter how much spectrum is allocated to mobile broadband.

Question 2: What evidence do you think is relevant to assessing the extent of consumer benefits associated with meeting the increase in demand for mobile data?

The relevance of the evidence to assess the extent of consumer benefits associated with meeting the increase in demand for mobile data will revolve around cost. Once a better understanding of the impact of

[1] http://www.bbc.co.uk/news/technology-21579503

4G on the benefits to consumers is reached, this question can be more fully answered. However, as mentioned previously, LTE gives a poorer data quality at premium rates, when compared to use of Wi-Fi by mobile users. The future may see most consumers offloading services onto Wi-Fi, as a preference to mobile broadband.

Consequently, the goals of the 4G rollout may not be realised, because of alternate services (such as Wi-Fi) being made increasingly available. Evidence cannot be gathered on the extent of benefits associated with increasing demand for mobile data until the service is rolled out, however, in order to do this, spectrum has to be sacrificed to mobile broadband. Therefore, this question is the wrong way around – no further spectrum should be allocated for mobile broadband, as no particular consumer benefits can be adequately identified from the 4G rollout to date. As part of this, no mobile operators have announced what they will provide to consumers other than data. Therefore, the services on offer and the term 'data' also need better definition before the benefits can be studied.

Question 3: What proportion of mobile data traffic do you expect to be carried over (a) Wi-Fi and similar systems in licence-exempt spectrum and (b) mobile networks in licensed spectrum? How do you expect this to change over the period 2015-2030 and how do you expect total data demand for Wi-Fi and similar systems in licence-exempt spectrum to change over the same period? How might this vary by location, environment etc.?

Mobile users already offload onto Wi-Fi to make landline calls, which is used to transfer data over mobile radio spectrum. 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. Use of Wi-Fi could allow for a much larger capacity and faster throughput of data.

BEIRG believes that, as a consequence, Wi-Fi use will grow exponentially. It is not unfeasible to expect a 1000-2000% increase of Wi-Fi traffic over the period 2015-2030.

It should also be noted that mobile broadband is only one mechanism for data delivery, and it is one that cannot deliver what wired can. Use of wired Wi-Fi systems wherever possible to facilitate data delivery and use should be fully encouraged. While there is a difference in relative costs, the life of a wired network is 30-50 years, compared to 10-15 for wireless. Spectral efficiency of networks should be Ofcom's primary focus, and a concentration now on Wi-Fi provision by mobile operators to provide data access would help to relieve a great burden on spectrum use.

Question 4: What factors will act to change the spectral efficiency of mobile technologies in the future? What spectral efficiency values are appropriate for consideration in our study for the period 2015-2030?

BEIRG is in favour of encouraging telecommunications companies to farm their already held spectrum more effectively, allowing better use of UHF bands and relieving the pressure on other spectrum users such as PMSE, who fear further selloffs. The past actions of extending mobile broadband spectrum access, over supporting the reuse of existing resources, did not encourage sufficient efficiency amongst the mobile telephone industry. While PMSE is an efficient user of spectrum, able to make use of interleaved spectrum to operate alongside other users such as DTT, mobile telephone technology is not.

BEIRG is concerned that the mobile companies have so far not best utilised their current spectrum allocation and that much more efficient use could therefore be made of this limited resource. Refarming could be

complimented with additional base stations for the bands already held by mobile operators, to remove the need for further spectrum allocation and improve spectral efficiency, and help reduce spectrum pollution (including out of band energy) for mobile and other spectrum. It is therefore imperative that mobile telephone companies look at their existing spectrum holdings and be encouraged to get the most appropriate value out of it, as applicable to its propagation characteristics. UHF spectrum operates over long distance, whereas a high band has a smaller propagation more appropriate for networks operating with additional base stations.

Ofcom must plan for the long term across all industry sectors, and BEIRG would support future refarming efforts from Ofcom and the telecommunications industry. 800MHz and 2.6GHz, now auctioned to the mobile companies, must be made best use of in the most efficient way possible, to ensure fair use of spectrum among all industries. BEIRG feels that no decision should be made on the 700MHz band until it is clear how much demand can be met by refarming the licenses in question, and ensuring the efficiency of new services. If future demand can be met in this way, then BEIRG cannot see why access to the 700MHz band should be allowed for mobile broadband at the expense of other industries.

If PMSE does not have sufficient access to spectrum, its capability to produce content will be severely hindered – even to the point where the industry will not be able to supply enough content for consumers to watch, ironically in some cases via broadband access, rendering the increased mobile broadband levels unnecessary and impacting on the service quality received. Content creation comes before content delivery. This fact should not be underestimated, or ignored.

Question 5: What service bit rate values are appropriate for consideration in our study for the period 2015-2030? What evidence do you have of changing needs for service bit rates?

It is likely that acceptable bit rates will be directly proportional to the cost to consumers, and what they consider to be worth paying. This could be largely dictated by economic conditions, especially as 4G services are expensive. Consumers in South Korea, as noted above, are taking up 4G – yet no money is being made by the operators.

Question 6: What proportion of traffic do you consider should be assumed to be carried on each cell types for the period 2015-2030? How will this vary with service environment i.e. between home, office, public areas, rural, suburban and urban? What evidence do you have of the factors affecting the uptake of small cells in licensed spectrum in the future?

Again, the proportion of traffic is directly proportional to the relative cost of activity – in office and public areas where Wi-Fi is available to consumers, people will choose to use this cheaper option to send and receive data, rather than paying for mobile services. The coverage of the system will therefore relate to the number of cells used at home or in offices to improve coverage. Bigger organisations are increasingly replacing their landlines with small cells from a cost point of view.

Question 7: Given the current mix of services on cellular networks what is the ratio of downlink to uplink capacity currently dimensioned for and how would you expect this to change over time by 2015, 2020, 2025 and 2030? How do you expect the ratio of downlink to uplink demand to vary for the service categories given in Table A5.4 of Annex 5, and what factors might affect this? How does this ratio of

downlink to uplink capacity change (if at all) with network radio access technology and offload to licence-exempt systems?

No comment.

Question 8: What are your views about the pros and cons of the frequency ranges in Table A6.1 in Annex 6 for mobile broadband and for existing applications using this spectrum? Do you have views on other bands that are not in Table A6.1?

PMSE access to clean, interference free spectrum is vital. The vast majority of PMSE operations lay currently between 470-798 MHz, where BEIRG believes it must now remain to ensure the PMSE industry is protected adequately. Ofcom should not consider any reduction in PMSE's spectrum access, for the sake of increased spectrum availability for mobile operators.

Further to this, BEIRG would like to see the 1427-1527 band opened up fully for use by PMSE, to help meet rising demand from our own sector, and to ensure that high-quality content production can continue. This would aid the PMSE sector by helping to ease future issues of spectrum scarcity. The band should be made available on a geographic basis for PMSE and look to make up for the PMSE spectrum already lost to mobile services. However, it should be noted that this would not be considered a complete solution for PMSE, but welcome assistance and a step in the right direction for PMSE support.

Question 9: Are there any other bands that are not in Table A6.1 for which you think we should be considering their pros and cons for mobile broadband and for existing applications using this spectrum?

Ofcom have considered enough bands for mobile broadband already. No further spectrum should be allocated for mobile broadband until the current allocations are used efficiently, in a way that maximises traffic and usage, until a full understanding of future demand is obtained.

PMSE drives content production, the content that mobile broadband is designed to supply. Demand for spectrum must be assessed in a realistic way before any others are examined. Furthermore all displaced services (including PMSE) must be adequately rehoused in a stable, new home before future allocations are made.

Question 10: What are your views on bands which should be a priority for consideration for mobile broadband?

Use of mobile networks will increasingly require a high capacity in small physical areas. BEIRG believes that spectrum above 60GHz should therefore be considered as an alternative for mobile broadband, as it would be more efficient than the UHF spectrum envisaged for use by mobile operators currently. This should be looked at as a priority, before the UHF band is completely divided up, as a more practical and efficient solution.

BEIRG is generally in favour of 600 MHz remaining as a single lot, rather than being split between several users. PMSE requires continuous access across several channels to operate effectively. If this is removed, the PMSE sector will suffer from a lack of clear spectrum, LTE base station interference, content production will be greatly affected, and this may subsequently provoke excessive costs to the industry in repurchasing or retuning new equipment. Ideally, BEIRG would prefer the 600 MHz band to be awarded as a smaller,

single lot, with a separate, contiguous block of spectrum, dedicated for PMSE use. This block should be allocated on the basis that PMSE is its primary user and should consist of at least 3 contiguous 8 MHz channels.

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.

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 APWPT, 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. See their website here http://www.apwpt.org/.