

Radio Spectrum Policy Group Consultation

British Entertainment Industry Radio Group (BEIRG)

RSPG Opinion on Common Policy Objectives for WRC-15

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Executive Summary

- BEIRG welcomes RSPG's intention to oppose the co-primary allocation of 470 – 694 MHz for mobile use but asks RSPG to oppose Agenda Item 1.2 at WRC 15.
- BEIRG requests that, at WRC 15, RSPG pursue a figure of -42dBm/8 MHz for 10MHz for out of band emissions (OOBE) in the 700 MHz band, as currently proposed by CEPT. This figure should be extended

to all channel bandwidths. Only this level will serve to protect spectrum below the 86 – 854 MHz frequency band. The currently proposed level of -25dBm/8MHz is unacceptable.

- BEIRG thinks that it is a mistake to base spectrum policy on unreliable and probably inaccurate forecasts of future mobile broadband demand, especially when the results of that policy may prove to be negative for another, important sector.
- 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 MNO's 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 RSPG, or individual regulators, undertake an independent analysis of projected mobile data demand in 2020. Furthermore, BEIRG calls upon RSPG to undertake an independent review of the efficiency with which MNOs utilise the spectrum to which they currently have access.
- If Agenda Item 1.2 is approved without appropriate mitigating safeguards, then the European and especially UK PMSE Sector will suffer a serious blow from which it may not recover. Major national events and industries would potentially be disrupted to the point at which some events would be unable to be staged at all. The amount of future investment and support for the PMSE sector may be reduced as investors lose confidence due to the loss of stability and security.

Agenda Item 1.1

BEIRG welcomes RSPG's decision to oppose a co-primary mobile allocation in the 470 – 694 MHz band. For the reasons outlined later in this consultation response, BEIRG does not believe that MNOs need to be allocated additional spectrum. Indeed, we believe that the interests of consumers and other users of spectrum would be best served through more efficient use by MNOs of spectrum which they already collectively hold.

By opposing the co-primary mobile allocation, RSPG helps to provide some stability for the PMSE sector which, in the past, has been sorely lacking. The industry had been racked with uncertainty for several years as discussions regarding the clearance of the 800 MHz band progressed. PMSE users hoped that that clearance would mark the end of this uncertainty and the creation of a stable environment in which they could work. Instead, almost immediately, discussions began about the clearance of the 700 MHz band. In effect, manufacturers, suppliers and users of PMSE equipment have not enjoyed the stability, on which any industry relies, for over a decade.

Instead, the PMSE industry in the UK has faced serious upheaval. The clearance of the 800 MHz band, and the threatened clearance of the 600 MHz band has placed a serious financial burden on the industry. The threat of interference from unlicensed White Space Devices (which would compete with any future potential '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 clean spectrum available to operate necessary

quantities of PMSE equipment for large-scale productions to be staged at prime venues across the UK and Europe.

BEIRG request that RSPG use its considerable influence to persuade its international counterparts to continue to oppose the co-primary mobile allocation of the 470-694 MHz band, not just until 2030, but beyond this date.

Agenda Item 1.2

BEIRG strongly opposed the decision taken at WRC12 to propose a co-primary mobile allocation to the 700 MHz band. BEIRG continues to hold this position and calls upon RSPG to oppose this decision at WRC 15, for the reasons explained in this consultation response.

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 nearly £72 billion annually to the UK and European economies¹. PMSE services contribute significantly to the economic, cultural and social wellbeing of Europe. For example, London theatres, which use PMSE equipment to produce much of their content, attract visitors from all over Britain and tourists from across the world. The current annual turnover of London theatres through ticket sales alone is £618.5 million, which represents just over 22 million attendances annually². Including downstream revenue such as merchandise, and the surrounding tourist industry, the estimated economic impact is £1.5 billion. Similarly, music festivals and live music concerts also contribute a significant amount to the British and European economies. Yet all of this success, both economically and culturally, would be placed in jeopardy if the 700 MHz band were to be cleared for use by MNOs.

The Draft Opinion on Common Policy Objectives for WRC-15 states that the Objective “should take into account several elements including the requirements of concerned services”. PMSE is a very concerned ‘service’, as a decision to approve Agenda Item 1.2, unaccompanied by significant mitigating steps, would jeopardise our entire sector.

Without sufficient access to spectrum, the PMSE sector’s ability to produce content for consumers will be severely hindered. It is essential to recognise that any impingement on PMSE usage poses a serious threat to the revenue generation of this 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. Therefore, new services need 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.

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

¹ <https://www.gov.uk/government/news/creative-industries-worth-8million-an-hour-to-uk-economy>

² SOLT, *London Theatre Report*, pg.8,
<http://www.solt.co.uk/downloads/pdfs/pressroom/London%20Theatre%20Report%202014.pdf> (accessed on 15th August 2014)

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 MNOs and 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 Europe is extremely high, and growing. Upwards of 90,000 requests for PMSE spectrum access are made to the licensing 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.

Out of Band Emissions

BEIRG is deeply concerned that the levels for out of band emissions (OOBE) for the 700MHz band have been proposed as -25dBm/8MHz. In contrast, CEPT has proposed a value of -42dBm/8 MHz for 10MHz channels and yet this was not accepted at the JTG4-5-6-7 meeting. It is absolutely imperative that RSPG pursue the figure of -42 dBm/8 MHz for all channel bandwidths in order to protect spectrum below the 806 – 854 MHz frequency band.

Future Mobile Data Demand

Agenda item 1.2 is predicated on the basis that, in the future, demand for mobile broadband will increase dramatically. While BEIRG recognises that mobile data demand will increase, it would be irresponsible for the WRC 15 to base its decisions on hypothetical and contentious predictions of mass growth in demand.

‘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), 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’³.

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 kilometer 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.

³ Aalok Mehta and J. Armand Musey, *Overestimating Wireless Demand: Policy and Investment Implications of Upward Bias in Mobile Data Forecasts*, p. 11

The commercial value of spectrum, the report suggests, means that Mobile Network Operators 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 hundred⁴.

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 Programme Making and Special Events sector's access to spectrum. As the quantity and quality of spectrum available diminishes, the quality of production within the PMSE sector, and hence its contribution to the European 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'.

The website CBROnline recently reported that research from Goldman Sachs has suggested that Wi-Fi will become the dominant wireless access technology for the Internet of Things (IoT). Goldman Sachs reported that 70% of respondents to a survey by VDC Research stated that Wi-Fi would be the dominant technology⁵. CBROnline also reported, in May, comments from Neul that 4G technologies such as LTE will struggle to play a meaningful role in the IoT⁶. These assessments reveal the vast uncertainty surrounding predictions of future uses of technology such as mobile broadband.

The predictions for data use on which Agenda Item 1.2 is based appear to be rooted in speculation. There does not appear to be a consideration of market forces or economic constraints. For example, will consumers actually be prepared to pay for so much data? BEIRG would also be keen for RSPG to quantify what this explosion in data usage would actually translate into in terms of daily use, as this may give some insight into how realistic these predictions are.

In its consultation on the clearance of the 700 MHz band, Ofcom acknowledge the 'uncertainty over forecasts of demand'⁷. And yet a decision which will have a negative, potentially catastrophic, effect on one of the UK's most vital sectors, the Creative Industries, may be taken based on this 'uncertainty'. While some predictions indicate that demand for mobile data will increase based on current usages, they do not reflect the consumer's willingness to pay for additional data. Nor do they recognise the fact that the content for which consumers need mobile data is created by PMSE users. Any damage to the PMSE sector will inevitably reduce the quantity and quality of the content consumed over mobile data, thus potentially reducing data demand itself.

⁴ 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>, (accessed 23rd July 2014)

⁵ 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> (accessed 23rd July 2014)

⁶ CBROnline, "Internet of Things can't be built on LTE", <http://www.cbronline.com/news/internet-of-things-cant-be-built-on-lte-4263590> (accessed 23rd July 2014)

⁷ Ofcom, Consultation on the Future Use of the 700 MHz Band, pg. 19

Before any decision is made regarding RSPG's stance on Agenda Item 1.2 at WRC 15, BEIRG urges RSPG to carry out **clearly independent** analysis of future mobile data demand.

Also, BEIRG asks that RSPG carry out independent analysis of the efficiency with which MNOs use the spectrum to which they currently have access. BEIRG believes 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 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, before RSPG finalises its support for Agenda Item 1.2 and a clearance of the 700 MHz band.

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 coverage⁸. 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.

In addition to the proposed use of the 700 MHz band by MNOs, the exceptionally high levels of out of band energy for both 10MHz channels and even higher for > 10MHz channels will pollute the adjacent spectrum and the duplex gap for PMSE or DTV use. Is this efficient use of spectrum?

In the UK, Ofcom has 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

⁸ Eurexcm Engineering, *Study for the European Commission – Enterprise and Industry Directorate General: Technical support relating to performance of antennas of mobile phones, Final Report*, 28 January 2014

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. RSPG 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 of networks should be RSPG's primary focus, and a concentration now on Wi-Fi provision to provide data access would help to relieve a great burden on spectrum use, and allow PMSE to continue operating at its current level.

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 the Association of Professional Wireless Production Technologies (APWPT)⁹, 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.

⁹ <http://www.apwpt.org/>