



Europe

## **GSMA Europe Response to the RSPG Draft Opinion for Public Consultation on**

### **Common Policy Objectives for WRC-15**

12 January 2015

**Daniel Gueorguiev**  
**Public Policy Advisor**

Park View, 4th floor  
Chaussée d'Etterbeek 180  
1040 Brussels  
E-mail: [dgueorguiev@gsma.com](mailto:dgueorguiev@gsma.com)  
<http://www.gsma.com/gsmaeurope/>

**Register ID Number: 30988577529-37**

## **About the GSMA**

The GSMA represents the interests of mobile operators worldwide, uniting nearly 800 operators with more than 250 companies in the broader mobile ecosystem, including handset and device makers, software companies, equipment providers and Internet companies, as well as organisations in adjacent industry sectors. The GSMA also produces industry-leading events such as Mobile World Congress, Mobile World Congress Shanghai and the Mobile 360 Series conferences.

For more information, please visit the GSMA corporate website at [www.gsma.com](http://www.gsma.com). Follow the GSMA on Twitter: @GSMA.

## 1. Executive Summary

This document is GSMA's response to the RSPG document entitled "(Draft) RSPG Opinion on Common Policy Objectives for WRC-15" (RSPG14-578(rev1), dated 12 November 2014). Our response focuses primarily on WRC-15 Agenda Item 1.1 (see section 2). We also make a few comments regarding some other agenda items in section 3.

Overall, the GSMA welcomes the Draft RSPG Opinion on WRC-15 as it seeks to support the vital task of finding more spectrum for mobile broadband/IMT at WRC-15. Demand for spectrum for mobile broadband is increasing rapidly, at the same time as changes in consumer behaviour and technology developments are happening in Europe and the rest of the world.

The GSMA has identified the following four frequency ranges / candidate bands that are suitable for mobile broadband and from within which we believe the need to identify additional spectrum for IMT at WRC-15 can best be satisfied. Each of these frequency ranges provides a different balance between coverage, capacity and performance, and a combination of bands will therefore be required.

- Sub-700MHz UHF (470–694 MHz)
- L-Band (1350-1400 and 1427-1518 MHz).
- 2.7–2.9 GHz
- C-Band (3.4-3.8 and 3.8-4.2 GHz)

These frequency bands are discussed in more detail in section 2, however the following paragraphs summarise some key points in relation to the Draft RSPG Opinion.

**470-694 MHz.** There is a need for more regulatory flexibility in this band in order to be able to meet the differing needs of different countries, and rapidly evolving developments in delivery of audio-visual content. The statement in the Draft RSPG Opinion that Member States should have flexibility to use the 470-694 MHz band for mobile broadband downlink appears to recognise this need, however the statement that Member States should support no mobile allocation in this band is at odds with this. A co-primary allocation to the mobile service is the best way to provide the flexibility needed to allow Member States to use the band in an optimum and efficient way according to their needs and developments. Failure to act at WRC-15 would see the band blocked for mobile broadband use for many years in countries that would like to use it, and would put Europe at a competitive disadvantage. At the same time, such a co-primary mobile allocation at WRC-15 would not force any Member State to actually use the band for mobile in the foreseeable future if it prefers to continue to use the band for broadcasting. The allocation would simply provide the mentioned flexibility for Member States to use the band also for mobile in line with the ITU Radio Regulations.

**L-Band.** The Draft RSPG Opinion recommends that Member States should support the worldwide identification of 1427-1518 MHz for IMT. The GSMA strongly supports this, and we believe it should be possible to have widespread harmonisation of this band across the world. Furthermore, we believe that 1350-1400 MHz also offers significant potential for harmonisation and use for mobile broadband in many countries around the world, in particular for IMT uplink.

**2.7-2.9 GHz.** The EC Spectrum Inventory Report has noted that the 2.7-2.9 GHz band is "substantially underutilized" in most Member States, and it is clear that spectrum in this band is not being used efficiently. The GSMA believes this band is an attractive and feasible option to provide additional capacity spectrum for IMT, possibly based on band segmentation between radars and IMT.

**C-Band.** The GSMA welcomes that the Draft RSPG Opinion clearly supports the worldwide identification of the frequency bands 3.4-3.6 GHz and 3.6-3.8 GHz for IMT. We believe that the 3.8-4.2 GHz band is also an attractive option for providing additional capacity for high performance mobile broadband in the longer term.

The decisions made at WRC-15 will have a direct impact on the wealth, well-being and future prospects of all countries and their citizens in the EU and elsewhere in the world. The mobile industry (both directly and indirectly) created 3.6% of global GDP (equivalent to around 2 trillion Euros) and directly supported 10.5 million jobs in 2013 - this is expected to rise to 5.1% of GDP and 15.4 million

jobs by 2020.<sup>1</sup> In Europe, the mobile industry contributed 3.1% to Europe's GDP in 2013, equivalent to €430 billion.<sup>2</sup> This figure will increase to nearly €500 billion by 2020. In addition, mobile operators and the ecosystem jointly employ 1.8 million people in Europe.

## 2. Agenda Item 1.1

Mobile services are undergoing a period of dramatic growth causing a tremendous increase in data traffic which in turn is making new technologies and mobile spectrum essential. The rising data demand is being driven by the growing number of mobile subscribers, and particularly smartphone users, who are connecting to faster networks and consuming higher-bandwidth content and services such as video.

The number of mobile connections worldwide is predicted to increase from 6.9 billion in 2013 to 9.2 billion by 2020<sup>3</sup>, of which 5.9 billion are expected to be data-hungry mobile broadband connections. In Europe, the number of mobile connections in 2013 was 689 million, and is forecast to increase to 762 million by 2020.<sup>4</sup> A growing proportion of users will be connecting to 4G networks which are having a transformative effect on consumer behaviour. 4G connections are showing exponential growth, from just 3% of connections at the end of 2013 to a forecast level of close to 10% by the start of 2015<sup>5</sup>, and are expected to overtake the number of 3G connections in less than 5 years. Mobile operators in mature markets report that the average 4G user consumes double the data of their 3G counterpart.

These faster connections are being exploited by a rising number of smartphones that are tasked with increasingly bandwidth-heavy applications. The smartphone installed base is expected to grow from 1.5 billion in 2013 to almost 3 billion in 2017<sup>6</sup> resulting in a surge of traffic as these devices generate on average 48 times more mobile data than a basic feature phone<sup>7</sup>. Their larger screens make them especially suited to high-bandwidth on-demand video services which made up more than half of mobile data traffic in 2013 and are expected to exceed two-thirds by 2018.<sup>8</sup>

The ITU's spectrum demand model assumes that mobile traffic will increase between 44 and 80-fold between 2010 and 2020.<sup>9</sup> In response, mobile operators are investing heavily in new technologies (e.g. LTE and LTE-Advanced) and new network architectures (e.g. small cells). However, such is the speed of data growth that operators will require access to significant additional spectrum in future to efficiently meet widespread demand. Taking into account all other capacity enhancing measures, the ITU predicts that an average total of 1340-1960 MHz will be required for IMT/mobile broadband by 2020 (the variation reflects the upper and lower data demand estimates).<sup>10</sup>

The ITU predictions are in line with GSMA research which finds that 1600-1800 MHz will be required by 2020. Given around 1GHz has already been identified for IMT/mobile broadband, the GSMA recommends that, on average, an additional 600–800 MHz should be sought at WRC-15 worldwide. The amount needed for each national market will vary depending on differing levels of data demand and national priorities.

The new mobile spectrum should comprise a mixture of coverage (i.e. lower frequency) and capacity (i.e. higher frequency) bands so that networks can provide high speed, cost-effective services in rural and metropolitan areas and deep inside buildings. It must also be harmonised globally, or at least regionally, to drive the economies of scale required for low cost consumer devices and to enable roaming and minimise cross-border interference.

The GSMA proposes the following four frequency ranges within which the need for additional spectrum for mobile broadband/IMT can best be satisfied:

---

<sup>1</sup> GSMA Mobile Economy Report 2014

<sup>2</sup> GSMA Mobile Economy Report Europe 2014

<sup>3</sup> GSMA Mobile Economy Report 2014

<sup>4</sup> GSMA Mobile Economy Report Europe 2014

<sup>5</sup> GSMA Mobile Economy Report Europe 2014

<sup>6</sup> GSMA Mobile Economy Report 2014

<sup>7</sup> Cisco VNI Mobile, 2014

<sup>8</sup> Cisco VNI Mobile, 2014

<sup>9</sup> Report ITU-R M.2290-0

<sup>10</sup> Report ITU-R M.2290-0

- Sub-700MHz UHF (470-694 MHz) can deliver high quality, wide area coverage for mobile broadband services including in rural areas and deep inside buildings.
- L-Band (1350-1400 & 1427-1518 MHz) is capable of delivering additional capacity and coverage over relatively large areas, including inside buildings.
- 2.7-2.9 GHz would provide important extra mobile capacity, and deployments would be cost-effective because existing cell sites could be used.
- C-Band (3.4-3.8 & 3.8-4.2 GHz) provides, due to the size of the band, a unique opportunity to deliver very fast mobile broadband services in hotspots where mobile networks are under pressure from rapidly growing data usage.

## **Sub-700MHz UHF (470-694 MHz)**

Demand for spectrum for mobile broadband is increasing rapidly at the same time as video content delivery is changing. In some European countries terrestrial television delivery is a very small percentage of the total, with other content delivery platforms such as cable, satellite and IPTV/Internet taking a large share of the market. Some statements in the Draft RSPG Opinion appear to recognise this, however the conclusion that is drawn appears to ignore it.

The Draft RSPG Opinion indicates that Member States should have the flexibility to use the 470-694 MHz band for mobile broadband downlink (provided that such use is compatible with the broadcasting needs). We believe that the principle of flexibility is vitally important, given the vastly different levels of usage and requirements for DTT in different European countries, and large uncertainties regarding future demand for DTT and evolution of audio-visual content delivery platforms. However the statement in the Draft RSPG Opinion that Member States should “support no mobile allocation in the band 470-694 MHz” is fundamentally at odds with this, and is likely to stifle market developments. The way in which such flexibility would be reflected in the ITU Radio Regulations is in fact a co-primary mobile allocation in the band, which would not force any Member State to actually use the band for mobile, but would allow Member States that wish to do so to do it in line with the ITU Radio Regulations.

Usage of the DTT platform in Europe varies greatly from country to country. An independent assessment for the GSMA by Plum Consulting in 2013<sup>11</sup> highlighted that 59 million households in the European Union (i.e. 28%) in 2013 used terrestrial broadcast platforms as their primary means of watching TV. The use of the terrestrial TV platform varies significantly across Europe, with the proportion of households using DTT as the primary platform varying from less than 5% in countries such as Belgium and Germany to over 60% in some countries (e.g. Spain and Italy).

There are a number of changes taking place with audio-visual content delivery and consumption that will affect the situation over the next few years. Audio-visual content is increasingly being delivered over broadband networks, with increasingly large numbers of Internet video users and increasing usage of IPTV, and this growth is likely to accelerate in the coming years. Terrestrial TV broadcast demand is falling in Europe, with a significant shift from terrestrial TV delivery to broadband, cable and satellite in many countries. Although the public will increasingly consume content on-demand over broadband networks, we recognise that DTT will continue to play an important public role in many Member States by providing a base-package of TV channels. However a significant number of DTT channels deliver content for which immediacy does not add value, with a significant proportion of channels on DTT platforms in Europe broadcasting mostly repeats which are more suitable for delivery on demand through the internet or other online platforms. At the same time, mobile devices are also becoming a major way to consume audio-visual content, with mobile data traffic already more than 50% video and many broadcasters using cellular networks to deliver content through mobile apps.

The GSMA believes that the best way to give the flexibility needed for Member States to use this band most effectively is by means of co-primary allocation of the band. Failure to act at WRC-15 will see the band blocked for mobile broadband use for the foreseeable future, even in countries that wish to be able to use it. Current usage of broadcast TV in the band in some European countries is already such that it would be more efficient to allow flexible use of the band throughout the region.

---

<sup>11</sup> Plum Consulting, “Valuing the Use of Spectrum in the EU”, 2013

The GSMA is concerned that the apparent recommendation in the Draft RSPG Opinion to oppose a co-primary mobile allocation in the 470-694 MHz band could put Europe at a competitive disadvantage compared to other regions. Limiting Europe's flexibility for the co-existence and convergence of mobile and digital broadcast services will discourage investment in advanced mobile networks / content delivery platforms. Predictable, timely and affordable access to spectrum is an essential element for driving Europe's economic growth and job prospects, and delivering socio-economic benefits for businesses and individuals.

We therefore urge the European Union to adopt a strategy for the sub-700MHz band that allows individual Member States to decide whether to keep traditional TV broadcast services in the spectrum and/or to provide more spectrum for mobile broadband in order to expand social and economic opportunities. The way to do this is by having a co-primary allocation to mobile in the band at WRC-15.

## **L-Band (1350-1400 & 1427-1518 MHz)**

The L-band spectrum between 1350 and 1518 MHz (excluding 1400-1427 MHz, which should continue to be used and protected for passive services) provides a good balance of capacity and coverage over relatively large areas (including inside buildings) in order to deliver widespread mobile broadband services.

The GSMA welcomes and strongly supports the statement in the Draft RSPG Opinion that Member States should support the worldwide identification of the frequency bands 1427-1452, 1452-1492 and 1492-1518 MHz for IMT. We believe that the identification of this contiguous block of spectrum for IMT can be highly beneficial for providing mobile broadband with a good combination of capacity and coverage, and that there is excellent potential for widespread harmonisation of this spectrum across the world.

We also believe, however, that the 1350-1400 MHz band offers significant potential for wide harmonisation and use for mobile broadband, in particular IMT uplink, in many countries around the world. We do not believe that it would be beneficial for Europe to try to block countries in other regions from being able to use this band for IMT, and furthermore there are some EU Member States that we believe may want to use it.

## **2.7-2.9 GHz band**

The Draft RSPG Opinion on WRC-15 does not mention the 2.7-2.9 GHz band. However the recent Commission report on the Radio Spectrum Inventory noted that the 2.7-2.9 GHz band is "substantially underutilized" in most Member States, and it is clear that spectrum in this band is not being used efficiently. The GSMA believes that this band is a realistic and attractive option to provide additional spectrum for IMT, possibly based on band segmentation between radars and IMT.

The 2.7-2.9 GHz band is under-utilized in most Member States and most other countries around the world. In many countries there are none or only one or two radars in this band at fixed locations (e.g. airports), and in almost all countries the number of radars is relatively small (at most a few tens) occupying parts of the band at fixed locations. Even in countries where there are significant numbers of radars, there is potential for the band to be used much more efficiently, particularly if mitigation measures such as filtering and more modern radar technology are used. This has been recognised in the UK, which is one of the countries with the largest number of radars in this band. We believe it would be beneficial for further investigations to be undertaken into how spectrum in the band could be used more efficiently, including ways to improve spectrum efficiency of radar systems in the medium-long term.

It would be feasible to operate both radars and IMT in the band, under certain conditions. For example, the radars could be repacked into the upper portion of the band, with the lower portion used for IMT (band segmentation), with suitable frequency separation between them. Alternatively, the whole of the 2.7-2.9 GHz band could be used for IMT, with suitable exclusion zone (for certain

frequencies) around any remaining radars in the band. Compatibility/sharing studies that have been conducted in ITU-R<sup>12</sup> and elsewhere (e.g. by UK and Sweden) describe scenarios under which use of both IMT and radars in the band are compatible. Co-channel separation distances which may appear very large under worst case assumptions can be reduced to a few tens of kilometres through intelligent roll-out of the IMT network (e.g. antenna pointing and downtilt) in areas where this is required, and cross-border coordination can be used. Non-co-channel operation is feasible if suitable mitigation measures are implemented, including frequency separation and suitable IMT deployment practices, and in some cases improvements in equipment characteristics such as filtering.

The 2.7-2.9 GHz band represents an attractive option for providing additional spectrum for IMT due to its proximity to the 2.6 GHz band (2500-2690 MHz) which is already used for IMT. The two bands have very similar radio propagation characteristics, which means that the same cell sites could be re-used to provide additional capacity with similar coverage, thus allowing deployments to proceed relatively quickly and cost-effectively. There could also be benefits to be gained in terms of cost and complexity of mobile devices.

Significant economic benefits could be gained by making the 2.7-2.9 GHz band available for IMT/mobile broadband. Studies have been conducted by independent consultants Aetha Consulting to evaluate the economic benefits of making the band available for mobile broadband, and costs that would be incurred in order to achieve this, for different countries/regions around the world.<sup>13</sup> For Western Europe, it is estimated that the economic benefits of using the band for mobile services (over 8000 million Euros) would be over 10 times greater than the costs associated with relocating existing radars to other frequencies.

Existing radar users could be incentivised to use the band more efficiently through Administrated Incentive Pricing (AIP) and spectrum trading. Not all spectrum licence holders are facing the same rapidly growing demands as mobile operators, or have the same incentives to use their spectrum assets as efficiently as possible. Incumbent spectrum users, such as radar users, can be inclined to oppose change due to the costs involved should they need to re-plan, modify or upgrade their equipment. One way to help overcome this challenge, as highlighted by the UK regulator Ofcom, is to charge a more realistic amount for the use/holding of radio spectrum, thereby giving a greater incentive to use valuable spectrum more efficiently and free up under-utilised spectrum. This could be complemented with associated spectrum trading measures to allow users to be financially rewarded for their spectrum efficiency.

The GSMA believes that Europe should take a flexible approach towards the identification and future use of the 2.7-2.9 GHz band for IMT. We do not believe that countries where there are no or very small numbers of radars in the 2.7-2.9 GHz band (and other countries that may wish to take steps in order to be able to do so) should be prohibited from being able to use spectrum in this band for mobile broadband.

## **C-Band (3.4-3.8 & 3.8-4.2 GHz)**

The GSMA welcomes and supports the statement in the Draft RSPG Opinion that Member States should support the worldwide identification of the frequency bands 3.4-3.6 GHz and 3.6-3.8 GHz for IMT. Furthermore, we believe that the 3.8-4.2 GHz band is also an attractive option for providing additional capacity for mobile broadband in the longer term. The wide blocks of contiguous spectrum that C-band can potentially provide make it uniquely suited for high performance mobile broadband services, particularly in high density urban areas.

Although 3.4-3.8 GHz has already been designated for mobile broadband use in the EU, global identification for IMT and wider harmonisation would greatly enhance the benefits in terms of economies of scale and costs, and availability and choice of equipment, including consumer devices. Countries outside Europe could also benefit from initial economies of scale established in the European market.

---

<sup>12</sup> ITU-R document 4-5-6-7/715 Annex 30

<sup>13</sup> Reports from the studies conducted by Aetha Consulting are available at <http://www.gsma.com/spectrum/economic-benefits-of-portion-of-2-7-2-9ghz-from-mobile-services/>



The lack of wider harmonisation is one of a number of reasons why the 3.4-3.8 GHz band is not yet heavily utilised for mobile broadband. The current regulatory environment for this band prioritises incumbent wireless operators (e.g. WiMAX, LMDS) as well as satellite operators, and most EU Member States have assigned this band for “broadband wireless access” (BWA) and only in some limited cases for mobile. Another crucial factor is the lack of mobile devices available at present that support the 3.4-3.8 GHz band, and lack of handset ecosystem, which is in turn dependent on the limited number of mobile operators. This current situation for the 3.4-3.8 GHz band does not provide the right incentives for the mobile industry to invest and develop.

There is also a need to take into consideration the spectrum needed to develop and sustain future advanced mobile services. With the advent of LTE Advanced as well as the development of the next generation network and 5G in the coming years, the need for greater carrier bandwidths and aggregation will be substantial and necessitate realisation of the potential that C-band spectrum can offer for mobile broadband. As a critical band identified to facilitate the achievement of the Digital Agenda for Europe, the 3.4-3.8 GHz band (and potentially also 3.8-4.2 GHz) can offer important spectrum capacity for the mobile industry to deliver on those demands and make Europe the leader that it once was. However this will require the development of a clear strategy regarding future allocation and usage of C-band spectrum in Europe and regulatory certainty that is conducive to investment.

C-band spectrum is important for satellite services in some parts of the world, especially in tropical countries where the effect of rainfall has historically limited the use of other bands. However even in these areas, recent technological developments mean that rainfall is becoming less of a limitation<sup>14</sup>, with several satellite providers (e.g. o3B and Avanti) using higher frequency bands to deliver improved performance and better value services in the tropics. Identifying a portion of the C-band for IMT/mobile broadband on a global basis would still allow sufficient spectrum to support FSS services in the tropics and other areas where it is necessary. This would give national regulators greater flexibility to use the band as they see fit and prepare for the long-term demands of all services. Existing services can continue to be protected from interference through international coordination between neighbouring countries and the use of appropriate technical and regulatory conditions.

The GSMA thus believes that both the 3.4-3.8 GHz and 3.8-4.2 GHz bands should be allocated to the mobile service alongside existing satellite services, and that a significant portion (at least 3.4-3.8 GHz) be identified for IMT/mobile broadband on a global basis. The size of this band provides a unique opportunity to deliver very fast mobile broadband services in hotspots and other high data demand locations where mobile networks are under pressure from rapidly growing data usage. There is an opportunity to identify a globally harmonised portion for IMT/mobile broadband, and evidence that mobile and satellite services could co-exist in separate parts of the band<sup>15</sup>, or use the same frequencies in different geographical areas within a country<sup>16</sup>.

### **3. Other agenda items**

#### **Agenda Item 1.2**

The GSMA can support what is said in the Draft RSPG Opinion regarding WRC-15 Agenda Item 1.2. We have believed from an early stage that 694 MHz is the most appropriate lower edge for the allocation of 700MHz band spectrum to the mobile service in Region 1 under Agenda Item 1.2. We welcome the agreement in Europe to adopt a band plan for the 700MHz band that is harmonised with the lower 2x30MHz duplexer of the APT 700MHz band (3GPP Band 28). The timely release of the 700MHz band is essential in order to ensure the widespread availability of cost-effective mobile broadband services, especially in rural areas and inside buildings. A requirement consequential to such release is to complete cross-border coordination across Europe to enable nationwide use of the band for mobile broadband from the outset.

---

<sup>14</sup> ITU-R document 4-5-6-7/550, “A study of rain fade depth on FSS frequency bands”

<sup>15</sup> ITU-R document 4-5-6-7/355, “Study into adjacent channel compatibility/sharing between IMT and ubiquitous FSS earth stations in 3.4-4.2 GHz”

<sup>16</sup> APT document APG15-3/INF-03, “IMT-FSS coexistence scenarios in C-band”



## **Agenda Item 10**

The GSMA also supports the proposal in the Draft RSPG Opinion regarding WRC-15 Agenda Item 10. We agree that it is important to identify opportunities to promote European policies through action at future WRCs with the objective to promote European arrangements at a global level, and concur with the RSPG proposal to recommend support for a future Agenda Item addressing the spectrum needs for the fifth generation of mobile networks.