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## **GSMA Europe response**

### **GSMA Europe position on *Draft RSPG Opinion on Aspects of a European Approach to 'Collective Use of Spectrum'***

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## 1.0 Executive summary

GSMA Europe (GSME) welcomes the opportunity to present a position on the public consultation on the draft RSPG Opinion on “Aspects of a European Approach to Collective Use of Spectrum” (hereafter referred to as ‘the document’).

GSME is of the opinion that:

- 1) Designating spectrum for CUS can, in practice, represent an irreversible decision if devices spread throughout the community with little information on the users and usage involved. As such, spectrum should only be designated as CUS if there is sufficient certainty that the likely benefits of CUS will outweigh the benefits of alternative applications that would require the use of that band to be licensed and will outweigh costs such as interference to other bands.
- 2) Given that investment and planned technology are based on the ability to use spectrum in a certain manner, frequency owners need certainty that no interference will change the spectrum value itself and will not jeopardise infrastructure investments based on certain assumptions for spectrum use.
- 3) UWB limits should not be applied to non-UWB equipment without a thorough analysis. The power spectral density limits for UWB have been derived based on assumptions regarding the characteristics of UWB devices e.g. with respect to the number of devices, deployment scenarios (UWB devices are assumed to be operated mainly indoor), mitigation techniques such as low duty cycle or detect and avoid. These assumptions are not likely to be the same for other transmissions from CUS.
- 4) If further spectrum can be justified for CUS, we agree that one approach is to make spectrum available in higher frequencies (for example above 40 GHz where spectrum is more widely available and where flexible approaches are most appropriate).

GSMA Europe is the European interest group of the GSM Association, the premier global body behind the world's leading wireless communications standard. GSMA Europe represents around 147 operators in 50 countries/areas in Europe and counts around 588 million subscribers.



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## 1.0 General

The view that “spectrum managed under the CUS model has the potential to stimulate service innovation ...” implicitly indicates that the current availability of licence-exempt spectrum is insufficient and acts as an obstacle for innovation. Whether this is actually the case is not clearly explained or documented

GSME does not dispute that the principles of CUS are relevant with respect to short range, near field and low power communications, especially in higher bands. There is however no clear statements on distinctions between that and long range (e.g. national) communication networks in lower bands, implying that the views and principles stated may be valid on a more general basis. We doubt that such a general approach will serve end-users, operators or manufacturers and would recommend RSPG to be more specific in possible cases where CUS is considered superior and favourable also in domains traditionally served by individual authorisations and exclusive rights.

The term ‘user’ is applied throughout the document in a somewhat confusing way. It seems that this term can mean both end-user and licensee (holder of spectrum license with corresponding rights on a collective or exclusive basis). In some contexts this makes the document difficult to interpret as the role of the manufacturer vs. the licensee (e.g. operator) becomes difficult to fully understand. As an example, the document (par 2.2) outlines three levels of responsibility under the CUS model; the user, the manufacturer and the regulator, where the user is responsible for “applying ( ... ) the usage information provided by the manufacturer” and the manufacturer “ensures the conformity of the equipment ...”. In this picture the term user seems confusing. At the same time, it seems that the role of the manufacturer is relatively strengthened.

The document also discusses the term “private common” (par. 2.2), where “the rules that determine access to the band are set by the entity to which the band has been licensed”. This, if correct understood, possibly introduces a new layer of authority. The full explanation and consequences of this concept is not satisfactorily described.

## 2.0 CUS and Alternative models of spectrum management

Section 3.0 states:

“In the past, individual authorisations may have been granted (or assumed to be granted) access to spectrum on an “exclusive basis”. While this still may be appropriate in certain circumstances, primarily for safety of life services where the avoidance of harmful interference is critical, the granting of exclusive rights is becoming less and less common. This is because technical developments are further increasing opportunities for sharing, especially between licence-exempt and licensed services. This is beginning to cause a blurring of the distinction between particular spectrum bands either being used for licensed or licence-exempt devices.



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For major wireless applications, such as mobile communications, this is not a correct description of the situation. Exclusive rights are still the dominating principle applied to licensing of spectrum and are likely to remain so for a considerable timeframe. The assignment of exclusive rights for defined limited time periods is being done in an increasingly market driven fashion.

Given that investment and planned technology are based on the ability to use spectrum in a certain manner, frequency owners need certainty that no interference will change the spectrum value itself and will not jeopardise infrastructure investments based on certain assumptions for spectrum use.

### **3.0 Assessing the Pros and Cons of CUS**

As noted in section 4.1 of the document, designating spectrum for CUS can, in practice, represent an irreversible decision if devices spread throughout the community with little information on the users and usage involved. As such, spectrum should only be designated as CUS if there is sufficient certainty that the likely benefits of CUS will outweigh the benefits of alternative applications that would require the use of that band to be licensed and will outweigh costs such as interference to other bands.

Where there is substantial uncertainty over the development of technologies, GSME would urge caution and recognise the value of keeping the options open in relation to the future use of the spectrum.

Given that investment and planned technology are based on the ability to use spectrum in a certain manner, frequency owners need certainty that no interference will change the spectrum value itself and will not jeopardise infrastructure investments based on certain assumptions for spectrum use.

### **4.0 A Framework for CUS**

Section 6.1 of the document considers reliance on sharing mechanisms whereby devices operating under a CUS model are required to share spectrum with primary users and greater use of cognitive technologies.

GSME has great concerns with relying on cognitive technologies to detect and avoid other users. Cognitive devices are at a very early stage of development. Cognitive radio relies on knowledge of the characteristics of the primary users of the radio spectrum (a "signature") in order to avoid causing them harmful interference. Most proponents of cognitive devices assume that they will be licence-exempt. Once such devices are widely deployed, it is almost impossible to remove them from service. It is therefore also almost impossible for the licensed spectrum user to change his use of the spectrum.

Today's discussions on spectrum management are engrained by ambitions with respect to increased spectrum utilisation and less requirements for coordination. Much of these



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expectations are based on anticipated paths of technology development along with the manufacturer's collective attitude and priorities. Although there is considerable progress made in the field of technology, the only sound mechanisms so far for ensuring aspects such as interference protection and necessary quality of service are based upon coordination and proper spectrum management. Radio technologies able to share and "coordinate" spectrum amongst themselves and/or with other spectrum users are emerging, but in particular when spectrum is shared across different technologies, there is still a range of challenges to be handled. It is acknowledged in the document that "... the lower the barriers to entry and thus the greater the innovation potential, the harder it may be to manage interference and quality as a broader range of different applications will be able to access the band." However, the importance of these aspects and the caution by which they should be treated seem to be underrated. Operators of mobile communications networks have made huge investments in their infrastructure and are obliged to provide high quality services to both consumers and business customers. Such obligations are in many cases formalised through service level agreements, where breach may cause considerable economic loss to the operators. In particular proposals implying the co-existence of licensed and licence-exempt use in the same frequency bands give rise to major concerns.

The document outlines four "markers" "which can help to create a framework to determine when CUS is likely to be appropriate". Among the proposed markers are "the part of the spectrum being used" and "type of usage". Such markers seem to be a good starting point for a framework where the diversity and various degree of suitability with regards to the CUS concept across different frequency bands may be identified and further assessed in detail. In any case, the existing 'boundary stones' between licensed and license-exempt bands should not be moved without thorough analysis regarding aspects such as risk of harmful interference and quality of service.

### **5.0 Making Spectrum available for CUS**

Section 6.3 of the document considers whether there is a power threshold below which devices can operate across entire frequency ranges without causing interference to existing users: Extending the UWB limits is suggested.

GMSE have great concerns over applying general power spectral density limits derived for UWB equipment to non-UWB equipment. We believe that a band-by-band analysis is required to ensure that no interference is caused to existing users of the radio spectrum. We would also maintain that the affected services are fully consulted before equipment is exempted in particularly bands.

The generic power spectral density limits for UWB as provided in Annex A of the draft opinion have been derived based on assumptions regarding the characteristics of UWB devices e.g. with respect to the number of devices, deployment scenarios (UWB devices are assumed to be operated mainly indoor), specific mitigation techniques such as low duty cycle or detect and avoid (DAA). It should be noted that without of these mitigation techniques the UWB emission limits have to be decreased by 40 dB. These assumptions are not likely to be the same for other transmissions. UWB has been studied on a band-by-band basis over



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many years to derive these power spectral density limits and should not be applied generally to all CUS devices. Any additional increase of the noise level by new devices could cause interference or impact the capacity of existing radio systems leading to additional costs in infrastructure for mobile network operators.

The limits may be acceptable from the perspective of UWB but should not simply be transposed to other licence exempt technologies without a full analysis of the impact to existing users of the radio spectrum and taking into account the characteristics of both the licence-exempt and existing systems.

The recent example of Broadband access RLANs interfering with Meteorological radars at 5 GHz shows that it is important that a thorough compatibility analysis is carried out with the affected services