Information Paper

The suitability of an IMT identification in the 2.7-2.9GHz band at WRC-15

Background

At WRC-15, ITU Member States from around the world will agree on changes to international spectrum allocations and associated regulatory provisions. The outcome will be the single most important factor determining the future availability of affordable, ubiquitous, high-speed mobile broadband services.

Between 2008 and 2013 global mobile data traffic increased 45-fold. Such rapid growth means additional harmonised mobile spectrum must be made available to support growing demand. As a result, ITU Member States agreed to address international spectrum allocations for the mobile service under the top Agenda Item (#1.1) at WRC-15. The GSMA calculates that an additional 600-800MHz will need to be made available at the event to meet demand in 2020.

Given it can take a decade to make spectrum available, build equipment and launch services, administrations will need to make decisions at WRC-15 based on their spectrum requirements in 2020-2025. However, they will only license spectrum to operators when local data demands require it so existing users need not be impacted unless absolutely necessary.

Position

The GSMA's position is that the 2.7-2.9GHz can be considered a realistic and attractive option for a global IMT identification at WRC-15.

1. **The 2.7-2.9GHz band is currently underused in most countries.**

   The 2.7-2.9GHz band is primarily used for civilian and military radars which are mainly based at airports leaving the band unoccupied in other areas. In some countries there are no radars at all, in many others there are only one or two, while almost all of the remainder have no more than a few tens of radars operating in the band. Given the small number of radars in most countries, and their use of the band at fixed locations, there is a clear opportunity to examine using the band for mobile services.

2. **In countries where radar usage is heaviest there remains significant potential to use the band more efficiently.**

   Most of the radars operating in the band are ageing and were planned and installed when spectrum was less constrained. As a result they could be re-planned in a far more efficient manner, particularly if mitigation measures are used. These include using filters on existing radars to better control radio emissions and/or the use of more modern radar technology. This approach has been recognised by regulators like Ofcom in the UK, which is one of the heaviest users of radar, yet is still investigating re-planning radars to potentially allow mobile broadband use.[1]

3. **All existing radar requirements could be met in the band while still leaving a portion available for future mobile broadband use.**

   In countries which use radars heavily, there is sufficient bandwidth for existing radars to be efficiently repacked into the upper portion of the band, allowing the lower portion to be used for IMT with a suitable guard band between the two. In the many countries where the number of radars is very small, it may be possible for the full band to be made available for mobile broadband by operating appropriate exclusion zones around existing radars to prevent interference. Regulators in countries with very few radars could also choose to move them into a different band to allow the full 2.7-2.9GHz band to be made available for mobile services thus adding significant capacity nationwide.

4. **ITU sharing studies indicate that sharing can be possible without causing interference or making deployments impractical.**

   Results from ITU sharing studies indicate that radars and IMT can operate in the band under certain conditions.[2] In situations where the full band is made available for IMT, except in areas where radars are operating, the size of exclusion zones can be as small as a few tens of kilometres, where required, when mobile deployments are suitably planned. For example, interference from mobile networks can be prevented by pointing antennas away from radars and tilting them downwards to prevent emissions straying into the areas where radars are

1 See Ofcom's 'Mobile Data Strategy' – May 2014

2 See ITU-R document 4-5-6-7/715 Annex 30 and studies by the UK and Sweden

operating. Similar techniques can also be used to facilitate cross-border coordination and avoid international interference. The band could also be segmented to separate the frequency ranges used by mobile equipment and radars. This process can be facilitated by applying modern filters to radars and other mitigation techniques such as the afore-mentioned antenna pointing.

5. **Mobile broadband deployments in the band could be relatively quick and low cost as the same cell sites could be used as the existing 2.6 GHz band.**

   The proximity of the 2.7-2.9 GHz band to existing mobile broadband systems in the 2.6GHz band (i.e. 2.5-2.69 GHz) has a number of important benefits. The two bands have very similar radio propagation characteristics, which mean the same cell sites could be used thus allowing deployments to proceed relatively quickly and cost-effectively. Furthermore, electrical components in terminals may be re-used thus bringing down the cost of supporting the band in mobile devices.

6. **Mobile services in the band would deliver major economic benefits.**

   The evidence from detailed research into numerous markets around the world reveals that significant economic benefits can be gained by using the band for mobile services, even taking into account the cost of re-planning existing radars.[3]

Countries/Regions	Benefits Millions USD	Costs Millions USD	Net Benefits Millions USD	Benefit/Cost Ratio
Western Europe	10149	826	9323	12:1
Australia	951	241	710	4:1
Bangladesh	1100	15	1085	73:1
Brazil	3700	286	3414	13:1
Colombia	661	68	593	10:1
Egypt	494	28	466	18:1
Indonesia	1900	72	1828	26:1
Kenya	770	19	751	41:1
Malaysia	329	69	260	5:1
Nigeria	2700	36	2664	75:1
Pakistan	1260	24	1236	53:1
Saudi Arabia	290	77	213	4:1

7. **Existing radar users could be incentivised to share the band through Administrated Incentive Pricing and spectrum trading.**

   Not all spectrum licence-holders are facing the same rapidly growing demands as mobile operators, so don't 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 mobile services in their band(s) due to the costs involved should they need to re-plan, modify or upgrade their infrastructure. One way to help overcome this challenge, as highlighted by the UK regulator Ofcom, is to modestly increase the charge on spectrum usage. By raising the price beyond the existing level, which is often based solely on recouping spectrum management costs (ie. Administrated Incentive Pricing), there would be a greater incentive to use spectrum more efficiently. This could be complemented with associated spectrum trading measures to allow users to be financially compensated for their spectrum efficiency.

8. **The variation in national use of the band and mobile requirements, means greater flexibility for regulators is essential, especially in countries where there are no, or very few, radars.**

   Given the major requirement for additional mobile broadband spectrum in the coming years, and the limited use of 2.7-2.9GHz in many countries, it is essential that administrations have the flexibility to change how they use the band without being constrained by international spectrum allocations. Sharing studies show that cross-border interference issues are manageable as long as suitable measures are taken and these can be mandated at WRC-15 through new regulatory provisions.

3 The research was conducted by Aetha Consulting is available from the GSMA website

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