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GSMA Comments to the Industry Canada Decisions on the Transition to Broadband Radio Service (BRS) in the Band 2500-2690 MHz and Consultation on Changes Related to the Band Plan (Notice No. DGSO-001-10)

London, 6 September 2010

The GSM Association (GSMA)¹ welcomes the opportunity to provide comments on the issues set out in the discussion paper “Decisions on the Transition to Broadband Radio Service (BRS) in the Band 2500-2690 MHz and Consultation on Changes Related to the Band Plan”² and to provide our view on the future use of the 2.5 GHz band in Canada.

The GSMA would like to commend the Industry Canada’s initiative to review the current Canadian arrangements in the 2500-2690 MHz band to determine how it can be planned and allocated to maximise the overall benefit derived from that spectrum. Along with Industry Canada the GSMA shares the interest of putting radio frequencies into its most valuable use. In this context we believe most valuable use means maximising the welfare stemming from use of the 2.5 GHz spectrum to benefit Canadian society and its consumers. Furthermore, the GSMA promotes developing the mobile sector to the benefit of the Canadian consumer.

The importance of having internationally harmonised band plans

International harmonisation of frequency bands has many benefits. It is instrumental in achieving cost-effective roll-out of networks and drives service up-take. It also reduces harmful cross-border interference and helps facilitate international roaming. There are also significant economies of scale in

¹ The GSMA represents the interests of the worldwide mobile communications industry. Spanning 219 countries, the GSMA unites nearly 800 of the world’s mobile operators, as well as more than 200 companies in the broader mobile ecosystem, including handset makers, software companies, equipment providers, Internet companies, and media and entertainment organisations. The GSMA is focused on innovating, incubating and creating new opportunities for its membership, all with the end goal of driving the growth of the mobile communications industry. For more information see: www.gsmworld.org

² Reference: Industry Canada Consultation can be accessed at <http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf09881.html>

the production of radio equipment and handsets as harmonisation of technical specifications can result in up to 50% reduction in the cost of terminal manufacturing.

The GSMA strongly supports Canada allocating the 2.5 GHz band to mobile services in accordance with the ITU Radio Regulations allocations and the identifications to IMT. This band often referred as the “3G extension band”, is expected to become a capacity band for LTE and many countries have already been allocating it for mobile broadband services. While HSPA equipment has been available for a couple of years in this band, **the launch in December 2009 of LTE services of Teliasonera in Sweden, Norway**³ in this band will see an upsurge of devices available, that in an initial stage will be predominantly USB dongles.

The Canadian market is served by GSM, CDMA, CDMA2000 1X, GPRS, EDGE, CDMA2000 EV-DO, UMTS and HSPA based operators meaning the natural next step in developing their networks is to deploy LTE⁴, which will ensure backwards compatibility and integrated future growth, as well as reducing capital and operational costs, enabling affordable services to consumers. At the same time we recognise the global trend towards designing the 2.5 GHz band based on a more technology neutral approach, allowing for both TDD and FDD technologies in the band. Separation of paired and unpaired operations is essential, from an interference point of view, but also for granting technology neutrality between FDD and TDD systems in a harmonised environment.

As a consequence, the **GSMA agrees with Industry Canada that it should follow an internationally harmonised band plan which means implementing its suggested Option 2**⁵:

- FDD uplink in the 2500-2570 MHz band,
- TDD in the 2570-2620 MHz band, and
- FDD downlink in the 2620-2690 MHz band.

The Option 2 band plan has been widely adopted in Europe following a recommendation from the European Conference of Postal and Telecommunications Administrations (CEPT). Norway was the first country to license the 2.5-2.69GHz band in 2007, followed by Sweden in 2008, Finland in November 2009, and most recently Denmark, Netherlands and Germany in 2010. Some countries defined the auction adopting the CEPT band plan, while others had let the market decide between FDD and TDD. However, auction results have proven the market favours less uncertainty and harmonisation. In most of the market-driven cases we are seeing a convergence to ITU Option 1 (e.g. Norway and the Netherlands). More European countries are preparing to license the band soon, and there seem to be consensus on the advantages of following the approach that pre-configures FDD and TDD allocations.

³ TeliaSonera has nationwide 4G licenses in Norway, Sweden, Finland and Denmark. LTE mobile broadband services are being offered in the first three countries with speeds up to a maximum speed of 100 Mbit/s. During the first half year 2010, TeliaSonera has also opened up 4G for pilot customers in Finland, Denmark, Lithuania, Estonia and Latvia. For more information about this launch please refer to: <http://www.teliasonera.com/4g/index.htm>

⁴ Long Term Evolution (LTE) is the next-generation Mobile Broadband technology for both GSM and CDMA operators. More see: <http://www.3gpp.org/LTE>

⁵ This refers to International Telecommunications Union’s (ITU) Option C1 band plan of the ITU-R recommendation M.1036-3 and CEPT Electronic Communications Committee (ECC) reference ECC/DEC/(05)05; and the Commission of the European Communities decision of 13 June 2008 reference 2008/477/EC. All the key arguments supporting this band plan have been documented in the Global View Partners report “The 2.6 GHz Spectrum Band: Unique Opportunity to Realize Global Mobile Broadband” released in January 2010. This report can be downloaded at www.gsmworld.com/gvp_report.

Other countries, such as Singapore (which licensed the band in May 2005) and Hong Kong (October 2008), have followed an approach aligned with the ITU Option 1 band plan. Others, such as Chile and Brazil have defined this structure well in advance to licensing the spectrum to give more certainty to prospective investors and vendors on how they would be able to exploit it. **This trend means that Industry Canada Option 2 is clearly the mainstream option that will stimulate market growth, in a technology-neutral way and pro-competitive environment.**

HSPA and LTE equipment have been standardised and put into production for commercial delivery for the 2.5 GHz band. Departing from harmonization can have prohibitive cost implications. Having to add filters adjusting to a Canada-specific band edges for base stations is possible, but increases cost for the network operator potentially reflecting in higher prices to consumers. There have been estimations that in trying to reduce emissions between un-harmonised adjacent operations, the costs can be as much as USD 60 million per “mode of transmission border“ in a country of about 15,000 sites.

Also, for mobile use it is critically important to consider how Canada specific band edges will affect prices and performances of devices. According to information provided by major vendors mobile broadband devices for the 2.5 GHz band are being produced and will likely to be produced with filters that operate exactly within the frequency bands defined by **Option 2 International band plan**. Having a Canada-specific band arrangement means devices would have to be adjusted to those particular band edges for the Canadian market. This will impact increasing the cost of devices and network infrastructure, therefore reducing access of these mobile broadband services to consumers⁶.

It is worth highlighting that there are also high opportunity costs for missing the enormous benefits this band will have in terms of global economies of scale because it has been commonly defined in all three ITU regions allocated on a primary basis for terrestrial mobile communications. This means that an internationally harmonised band plan in the 2500-2690 MHz will most likely enjoy the minimum possible costs of network and handset equipment of all existing spectrum bands used for mobile so far.

Releasing spectrum to allow more Mobile Broadband growth

Currently the mobile industry is experiencing the large scale move from voice and simple data services to mobile broadband allowing mobile devices to access the Internet. This means significant increase in data traffic volume in mobile networks. Consequently the bandwidth used for mobile must increase to handle increased traffic volume. This means allocation of the 2.5 GHz band to mobile must happen to accommodate mobile broadband development.

- The mobile industry must have access to internationally harmonised spectrum in both the coverage bands and capacity bands with each operator dependent on the right mix of these bands. In general lower frequency bands allow for the roll-out of lower cost network coverage. Higher frequency band- based networks increase the cost of coverage, but are more suitable for providing capacity in urban areas.

⁶ More information on price increases and other implications on handsets stemming from non-harmonised spectrum bands is provided in the GSMA White Paper “The advantages of common frequency bands for mobile handset production – technical note”: http://www.gsmworld.com/documents/gsma_white_tech_note.pdf

The amount of spectrum issued to mobile operators determines their ability to deliver high-quality services to consumers and manage the bandwidth required to handle increasing traffic volume from the uptake of mobile internet services. The 2.5 GHz frequency band is unique because it includes a substantial amount of spectrum (190 MHz) to provide aggregated bandwidth. It presents mobile operators with an opportunity to acquire 2x20 MHz of contiguous spectrum, enabling them to operate high-speed LTE services at optimum performance. Orthogonal Frequency-Division Multiple Access (OFDMA) technologies like LTE and WiMAX need significantly larger channel bandwidths for optimal efficient operation. The 2.5 GHz band would make such allocation possible.

LTE is able to leverage the new and wider bandwidths to significantly increase data capacity in high demand zones such as dense urban areas. Industry Canada needs to allow existing mobile broadband providers to make further investments to improve the growth of the services they are offering with seamless connectivity and the highest possible capacity to handle traffic.

Consequently, the role of a 2.5 GHz internationally harmonised allocation to mobile to provide mobile broadband is of utmost importance not only for mobile operators but for consumers and for the Canadian society and economy.

Specific GSMA answers to Canada Gazette, Part I, June 12, 2010, Notice No. DGSO-001-10 Consultation:

8.1. Should operation of the TDD systems be permitted in the FDD portion of the band plan and, if so, under what conditions?

The GSMA notes that no TDD system operations should be allowed in the FDD portion due to interference issues not only among base stations but with terminals too. This is to say that if TDD systems operations are allowed in FDD portion would generate interference to FDD systems operating in the same geographical area in the adjacent FDD blocks as well as FDD systems operating in the same frequency block, or in a frequency block overlapping with the block of the TDD system, and in an adjacent geographical area.

Permitting TDD systems in the FDD portion of the band may well introduce significant complications into interference management. The way to reduce the interference between mobile broadband base stations using FDD and TDD respectively, while serving a mass-market in the same area, is to introduce: (1) Additional filtering in both receivers and transmitters; (2) Additional guard bands or restricted channels; (3) Reducing RF power (but this is not really a viable option as it will require additional base station sites). Applying these options reduces the efficiency in the use of the spectrum, increases equipment cost and reduces availability of end-user devices.

8.2. Should the guard band blocks 2570-2575 MHz and 2615-2620 MHz be held in reserve by Industry Canada or should they form part of the unpaired block (TDD)?

The LTE handsets and network equipment for FDD operation in the 2.5 GHz band are standardised and consequently put into production based on guard bands being applied in the TDD block of spectrum. In order to ensure proper operation of the technologies and minimizing

the risk of interference Canada should take this carefully into consideration and implement a solution where guard bands are taken from the TDD block. Diverting from this arrangement might affect the possibility to enjoy the benefits of an internationally harmonised global band extensively described above.

8.3. If the guard bands are to be held in reserve, should they be considered for future use by licence-exempt wireless systems?

No, the guard bands should form part of the unpaired block (TDD) and be used to avoid interference caused by TDD systems on FDD systems.

Comments on additional technical details related to the band plan, not addressed above that are relevant to GSMA.

9.3. The Department seeks comments on the challenges faced by more than one operator in making efficient use of the TDD block. Should Industry Canada rely on market forces or should it develop specific technical rules to facilitate coexistence between two or more operators and alignment with the Option 2 Band Plan?

The GSMA suggests that Industry Canada consider whether assigning the whole TDD spectrum block in the centre of the band to one operator and not splitting it might be the better option for this band. In this way, a more efficient use of current spectrum will be achieved. This is because different TDD networks will require coordination/synchronisation if they are not to require a large guard band between them. If there is to be more than one operator GSMA recommends that Industry Canada develop specific technical rules through the Radio Advisory Board of Canada (RABC).

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