To: Manager, Manager, Emerging Networks, DGSO, Industry Canada, 300 Slater Street, Ottawa, Ontario, K1A 0C8  
By email: spectrum.operations@ic.gc.ca

RE: Canada Gazette, Part I, Gazette Notice DGSO-006-12 dated October 20, 2012 and entitled “Consultation on Renewal Process for 2300 MHz and 3500 MHz Licences”

Ericsson Canada is pleased to submit its comments to Industry Canada’s Gazette Notice Gazette Notice DGSO-006-12 dated October 20, 2012 and entitled “Consultation on Renewal Process for 2300 MHz and 3500 MHz Licences” (“Consultation”).

Ericsson is a world-leading provider of telecom equipment and related services to mobile and fixed network operators globally. Ericsson has operated in Canada since 1953 and employs more than 3,100 people across the country. Ericsson serves Canadian customers by providing professional services, broadband and multimedia solutions and network infrastructure. In addition, Ericsson is directly and indirectly involved with many collaborative projects with Canadian universities and research institutions. Ericsson development sites in Canada also fulfill worldwide mandates in R&D, testing and support of wireless networks and multimedia services.

Ericsson is advancing its vision of being the prime driver in an all-communicating world through innovation, technology, and sustainable business solutions. Ericsson has enriched its LTE portfolio with both Time Division Duplex (TDD) and Frequency Division Duplex (FDD) product lines. As early as June 2010, Ericsson has demonstrated the first TD-LTE handover live into a FDD network showing the capability of seamless bidirectional handover between LTE FDD/TDD. 1

Ericsson actively participated in the preparation of the Radio Advisory Board of Canada’s (RABC) response to this Consultation. In general, Ericsson endorses the RABC’s technical position. In this submission, Ericsson will provide additional information on certain technical areas discussed in RABC’s response.

We trust that you will find these comments to be of value and as always, we are ready to work with Industry Canada in the future on this very important topic.

Sincerely,

Viet Nguyen  
Director, Regulatory and Government Relations

INTRODUCTION

Ericsson supports RABC’s view on promoting “spectrum arrangements that are harmonized with global or regional band plans permitting Canadian industry to gain access to a large equipment ecosystem, readily available standardized products and services at reasonable costs. Only harmonized band plans will ensure the most effective use spectrum which is a scarce public resource”.

Having a Canadian band plan that is not fully harmonized with global or regional markets or using equipment that is partially compliant with globally accepted standards could lead to a Canada specific ecosystem which will ultimately impede growth of Canadian industry and disadvantage Canadian users.

For both wireless communication services (WCS) 2300 MHz and fixed wireless access (FWA) 3500 MHz band, Ericsson is in agreement with RABC’s view that “At this time it is not possible to perform a full assessment of technology and band plans for 2300 and 3500 MHz”. Therefore, Ericsson recommends that Industry Canada allows time for further study and investigation with respect to the global situation and U.S. situation to understand the implications on Canadian industry before proceeding.

COMMENTS ON SPECIFIC SECTION

SECTION 5 – WCS 2300 MHz BAND

Based on the ongoing activities from global market and more recent activities from the U.S., Canada will likely have to select one of the following two options:

The first option is to adopt the already developed ITU global band plan and to take advantage of readily available 3GPP Band 40 standard equipment in a TDD arrangement covering 2300 - 2400 MHz. With this option, the two 15 MHz portions of WCS bands (2305-2320 MHz and 2345-2360 MHz) would be treated as two separate unpaired spectrum blocks adaptable for TDD LTE deployment.

To avoid the creation of a Canadian specific ecosystem, it is recommended that Canada avoids modification to standard equipment to fit with the current Canadian WCS band. In order take advantage of standardized 3GPP Band 40 TDD LTE equipment, it would be necessary to modify current Canadian technical rules. The modified technical rules will also have to consider protecting incumbent neighbouring users. This option may also require that some WCS spectrum be used as guardbands or reserved for restricted usage. This is an area that has yet to be resolved.
A clear advantage with this option is that the Canadian wireless industry would have immediate access to large TDD LTE ecosystem that already have been deployed in various Asia Pacific countries. However, this option does not permit roaming with the U.S. where a new FDD arrangement is being developed. In addition, as briefly mentioned earlier, a workable solution that would allow the deployment of TDD LTE and protect incumbent neighbouring users has yet to be determined.

The second option is to follow the U.S. FDD arrangement as jointly proposed by AT&T Inc. and Sirius XM Radio Inc and which has been adopted by FCC. It is important to note that the current WCS and S-DARS arrangement within the 2300 – 2400 MHz band is unique to U.S. and Canada.

This option offers a readily available technical and policy solution on how to introduce LTE in the WCS band and at the same time protect incumbent neighbouring users. If Canada decides to go with this option, both Canadian wireless and satellite radio users will be able to leverage services and equipment available for the U.S. market and users will be able to roam to the U.S. market. At this time, it is not clear when an LTE ecosystem for the U.S. will be available. It is expected however, that 3GPP will start the formal work on the technical standard for this FDD profile in January 2013.

For both options, either to follow the 3GPP TDD band plan or the U.S. FDD band plan; a new Canadian band plan will not likely be required but rather changes in technical rules and the policy governing the existing WCS band will be needed.

With small WCS band size (2x15 MHz), it is likely that both FDD and TDD cannot be deployed in the same geographic area due to potential interference between FDD and TDD but both could potentially be used in non-adjacent geographic areas. This is one of the issues that will require further consideration.

In summary, with the options discussed above, the current WCS band plan could still be suitable. However, it is likely that current policies and technical rules would need to be revised. Regardless which option is decided for Canada, it is most important to ensure Canadian spectrum band plan is globally or regionally harmonized spectrum allowing Canadian industry to leverage and benefit from large and available equipment ecosystem, neighbouring incumbent users are protected and available spectrum can be utilized to the maximum.

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2 Order on Reconsideration” considering modifications to the Wireless Communications Service (“WCS”) service rules in Part 27 of the FCC rules and adopting satellite radio repeater rules in Part 25 of the FCC rules, WT Docket 07-293 and IB Docket 95-91 (FCC 12-130)

3 At 3GPP RAN meeting #57 in Chicago, IL, USA, 4-7 September 2012, 3GPP RAN Working Group approved a Work Item for "LTE WCS Band" proposing to define 3GPP LTE in the band 2305-2315 MHz paired with 2350-2560 MHz based on the joint AT&T Inc. and Sirius XM Radio Inc. submission to FCC (approved by FCC in October, 2012)
SECTION 6 – FWA 3500 MHz BAND

The situation with FWA 3500 MHz band is different from that of the WCS 2300 GHz band in many ways.

This band was originally intended for fixed services. In order to introduce mobile services in the band, the current policy and the band plan have to be modified accordingly. As stated in the consultation, “Industry Canada expects significant changes over the next few years to international allocations for the mobile service and frequency arrangements in the 3500 MHz band. The Department will consider changes to the band plan and will modify current allocations in the Canadian Table of Frequency Allocations to harmonize with those of other countries, as appropriate”. Ericsson concurs with Industry Canada that in the future such change to Canadian Table of Frequency Allocations for mobile allocation is justifiable.

Currently FDD and TDD deployments are permitted in any of the paired blocks. With mobile applications, this arrangement could demand a very complicated coordination process between operators and even would require guardbands between operators. Potentially, there is a large amount of spectrum that could be made available in the future, from 175 MHz up to 300 MHz depending whether only blocks D to K or all blocks from A to M are considered. Therefore, if both FDD and TDD are needed, FDD and TDD could be planned in separate spectrum blocks with minimum guardbands required between operators. It is important that future discussions take into consideration incumbent licensees.

Furthermore, the current 3500MHz band plan does not match with any of the 3GPP band plans (3GPP band 22, 42 and 43) nor do the block sizes of 25 MHz map easily to the optimal 3GPP channels sizes. Standardized 3GPP equipment designed for band 42 and 43 could be used in the current Canadian band plan, however, there could be unused, wasted spectrum gaps because of the mismatch between the currently block size and 3GPP channel sizes. Guardbands may be required between spectrum blocks to mitigate interference between users. Current technical rules will likely have to be changed. It should be noted that 3GPP’s FDD band 22 and TDD band 42 are overlapping. Therefore, it is not possible for have these two bands in the same geographical areas unless guardbands are introduced.

The U.S. situation for the portion of 3550 – 3650 MHz and 3650 – 3700 MHz is not completely clear. It is not known when the U.S. will make a decision in regards to what kind of technical requirement will be adopted. As the end of the Open Meeting held on December 12th 2012, FCC has issued a Notice of Proposed Rulemaking (NPRM) And Order proposing the creation of a new Citizens Broadband Service in the 3550-3650 MHz band as well as in the 3650 – 3700 MHz band. The intention of the proposal as described in this NPRM and Order is to enable more

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4 Paragraph 51 of the Consultation
efficient use of radio spectrum based on the concepts of small cells and spectrum sharing. The FCC believes that, if implemented, “the proposals in this Notice will maximize the utility of the 3.5 GHz Band for the greatest number of consumers, businesses, and critical users while protecting important federal and non-federal incumbents from harmful interference”\(^6\). However, at the same, FCC realizes “that this is a complex proceeding, presenting a variety of novel issues”\(^7\). Comments and rely comments to this proposal are due on February 20\(^{th}\) and March 22\(^{nd}\) 2013 respectively. Until the U.S. situation is finalized, the equipment ecosystem and the possibility for Canadian users roaming to the U.S. are unknown. Clearly, besides the already defined 3GPP band plans, Canada has to take into account the ongoing U.S. process and the eventual FCC decision in selecting the most suitable option for the Canadian 3.5 GHz spectrum.

In summary, considering the existing international band plans and the ongoing U.S. discussion, Ericsson concurs with Industry Canada that “changes to the existing allocation and band plan may be considered in the next two to three years. Changes may include review of, and possibly revision to, the spectrum utilization policy, the band plan and the authorized frequencies. A consultation process will precede any such changes”\(^8\). As discussed above, without these changes, it would not be possible to introduce mobile services in any of portion of the FWA band. Consequently, it would not be possible fully take advantage of standardized equipment available from large ecosystem, and it would not possible to maximize the use of valuable spectrum.

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