

Please find below the response from Ericsson on the draft RSPG Opinion on a long-term strategy on the future use of the UHF band (470 – 790 MHz) in the European Union

Regards,
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Ericsson is pleased to be provided the opportunity to present our views on the future use of the UHF band (470 – 790 MHz) in the European Union, and to discuss some circumstances from a mobile broadband manufacturer's point of view.

Introduction

Ericsson is the driving force behind the Networked Society - a world leader in communications technology and services. Our long-term relationships with every major telecom operator in the world allow people, businesses and societies to fulfill their potential and create a more sustainable future. Our services, software and infrastructure - especially in mobility, broadband and the cloud - are enabling the telecom industry and other sectors to do better business, increase efficiency, improve the user experience and capture new opportunities. With more than 110,000 professionals and customers in 180 countries, we combine global scale with technology and services leadership. We support networks that connect more than 2.5 billion subscribers. Forty percent of the world's mobile traffic is carried over Ericsson networks. And our investments in research and development ensure that our solutions - and our customers - stay in front. Founded in 1876, Ericsson has its headquarters in Stockholm, Sweden. Net sales in 2013 were SEK 227.4 billion (USD 34.9 billion). Ericsson is listed on NASDAQ OMX stock exchange in Stockholm and the NASDAQ in New York.

Ericsson's detailed responses to the points made in the draft RSPG Opinion on a long-term strategy on the future use of the UHF band (470 – 790 MHz) in the European Union

The increasing rate of transformation of the incumbent terrestrial television (TTV) distribution industry is creating new exciting opportunities on the market of audio-visual services, where the fixed and mobile broadband services and applications have become the true generic key driver of economic growth, job creation and competitiveness serving societies and consumers with new and richer interactive multi-media experiences.

Internationally, the frequency range 470 – 694 / 698 MHz is allocated to the Broadcasting Service on a primary basis and is largely used for incumbent analogue and digital TTV using various non-harmonized national or regional technologies. Notably, in other regions of the world this range of spectrum is also allocated to the Mobile Service on a co-primary basis; which would suggest that such regulatory approach could also be introduced in Europe. The use of non-harmonized TTV technologies, in the global perspective, would suggest that there is a pressing need to institute a new global regime with a view of allowing travelers to enjoy TTV reception regardless of geographical location, very much as applicable to the current globally harmonized mobile broadband (MBB) technologies and services.

Sparsely populated rural areas require relatively speaking medium to high network capacity per square kilometer; subject to the smaller concentration of people, relatively large mobile network cells are sufficient which can be cost efficiently deployed in this lower frequency range. Therefore, rural users could enjoy a similar experience to people in living in cities while bands in the range 470 – 790 MHz are considered also to be made available for MBB services. For example, considering

carriers of 10 MHz channels bandwidth, typically used in rural areas, are aggregated and combined for the bands 700 MHz and 800 MHz bands, then the peak data rates for services may increase from 75 Mbps to 150 Mbps. Indeed, more harmonized spectrum for wide area MBB use will be needed below 1 GHz in the future to support more demanding communication services in rural areas.

1. RSPG supports the provision of wireless broadband services in the 700 MHz band, and recommends the Commission, in cooperation with the Member States, striving towards a coordinated approach, including
 - Defining, as early as possible the harmonized technical conditions for the use of 700 MHz by wireless broadband services.
 - Proposing in a binding legislative measure such as an RSP, the deadline by which the national authorization process should be finalized and the deadline for making the band available for effective use for ECS in line with harmonized technical conditions.

Ericsson indeed supports a view encouraging the designation and use of wide area MBB systems in the range 470 – 694 MHz on a pan-European basis. Ericsson is inviting the national and regional European Union (EU) policymakers to consider the implementation of timely, harmonized and coordinated regulatory practices under licensed conditions while reaping the benefits of the extended coverage afforded by the radio wave propagation condition in this range of spectrum, particularly in support of remote and sparsely populated regions.

Ericsson is of the view that it would be beneficial to apply the characteristics of a typical MBB infrastructure network applying the LTE standards to overcome many of the technical and operational challenges within the range 694 – 791 MHz; which also could support global roaming. Ericsson has no immediate opinion on a regulatory regime applying binding legislative measures; however, we wish to stress the need to apply a harmonized approach where e.g. a sub-region of EU could move ahead of other sub-regions.

2. Recognizing the importance of the 700 MHz band in the provision of wireless broadband across the EU, the RSPG recommends that Member States should undertake the transition as soon as possible, noting that there are numerous challenges to overcome but urging Member States to move quickly

Ericsson appreciates initiatives to provide for MBB usage in the range 470 – 694 MHz on a pan-European basis through harmonized and defined transitional arrangements. Ericsson understands that commercial MBB LTE equipment is already available in other countries outside of Europe for the band 703 – 788 MHz, which could also be made available for immediate deployments (already within year 2015) in EU.

Ericsson is further of the understanding that it would be beneficial to apply the characteristics of a typical wide area MBB infrastructure network design applying the LTE standards, exemplified by the Ericsson Communication System (ECS) RBS6000 family, to overcome many of the technical and operational challenges for the band 703 – 733 MHz uplink paired with 758 – 788 MHz downlink, but also for the range 470 – 694 MHz in an extended future.

3. RSPG recommends Member States to make the 700 MHz band available for WBB as early as possible setting a deadline for making the band available for effective use for ECS. Two dates are under consideration i.e. 2020 and 2022. This is without prejudice to constraints arising from cross border frequency coordination problems with third countries

Ericsson is of the understanding that the date of no later than year 2020 as a realistic deadline to migrate to the use for MBB. The reason being that there is a pressing need in the countries that already have deployed LTE in the band 800 MHz are by now coming close to congestion of the carried traffic in certain cell sectors of serving LTE base stations. This is particularly relevant to remote areas while using cost efficient and wide coverage areas. With a delayed and extended

introduction of MBB beyond 2020 in the band 703 – 733 MHz uplink paired with 758 – 788 MHz downlink in Europe, there might be a risk of falling behind the neighboring regions.

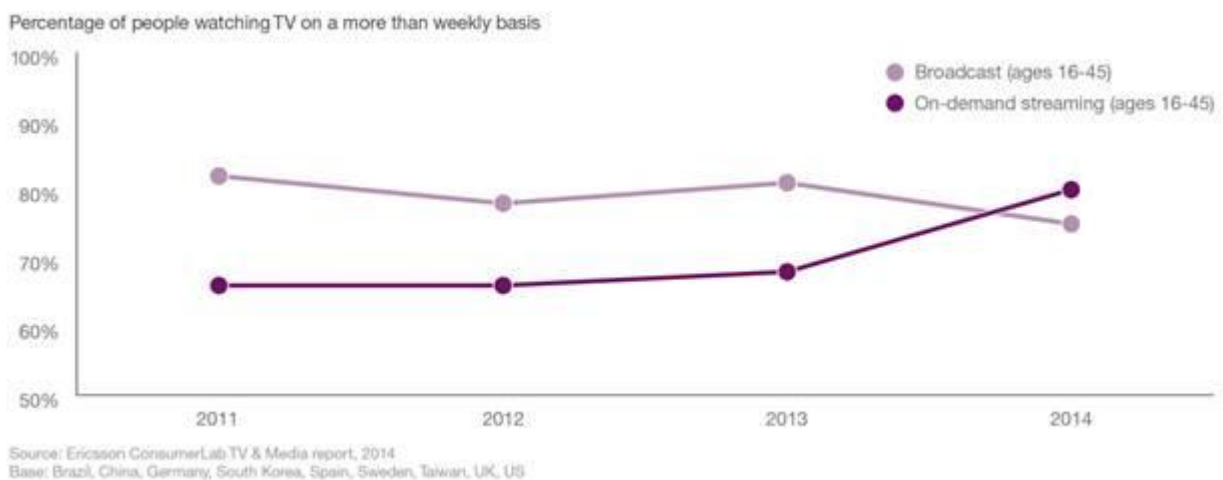
Ericsson is further of the understanding that it would be beneficial to apply the characteristics of a typical MBB infrastructure network applying the LTE standards, to alleviate many of the technical and operational challenges within countries as well as in frequency coordination circumstances with third countries.

4. RSPG recommends that Member States should develop and communicate to stakeholders and neighboring countries in due time, a framework for the migration of broadcasting services below the 700 MHz band and also to take into consideration all practicable efforts to accommodate the various timelines of their neighbors for either implementing WBB or not

Ericsson is of the understanding that there is a requirement to apply a technology neutral regulatory regime by the policymakers in Europe; however, it is our view that it would be beneficial for the industry to apply the characteristics of a typical MBB infrastructure network using the LTE standards for the band 700 MHz as well as for the range 470 – 694 MHz. Such approach would alleviate many of the technical and operational challenges within countries as well as in frequency coordination circumstances with third countries.

Ericsson is inviting the national and regional European Union (EU) policymakers to consider the implementation of timely, harmonized and coordinated regulatory practices under licensed conditions while reaping the benefits of the extended coverage afforded by the radio wave propagation condition in this range of spectrum, particularly in support of remote and sparsely populated regions.

Since year 2011, Ericsson has been following 9 countries (Brazil, China, Germany, Korea, Spain, Sweden, Taiwan, the UK, and the USA) to observe media behaviors and attitudes. In year 2011, 83 % were watching broadcast TV more than several times a week, with only 61 % viewing streamed content on demand. However, this behavior is now changing. Viewers are shifting towards easy-to-use, on-demand services that allow cross-platform access to video content. As seen in the figure below, this year (2014) in this study one can see the popularity of streaming overtake broadcast TV among those aged 16 – 45, with 80 % in this age group watching streamed video several times a week or more. While 77 % of the total sample population watched broadcast content compared to 75 % who favored streaming services.



Any future need to carry UHD TV content over terrestrial radio could be handled over LTE networks alternatively using spectrum in higher bands of the allocated spectrum all the way up to the frequency 3800 MHz.

While considering new uses in the range 470 – 694 MHz e.g. a timely and flexible approach allowing for both broadcasting TV and MBB use, subject to national circumstances, it is essential to implement a technology-neutral practice allowing for mobile industry initiatives to be specified and harmonized in a well-timed manner. Accordingly, policy makers would be invited to consider a co-primary “generic” mobile allocation for terrestrial use in the range 470 – 694 MHz. It is indeed a pressing need to have such co-primary allocation implemented in the ITU Radio Regulations at the World Radiocommunication Conference 2015 (WRC-15).

5. In order to facilitate adequate time for implementation of the necessary provisions to facilitate all Member States meeting the final deadline and noting that some Member States have already started cross-border negotiations, RSPG recommends that the remaining Member States begin negotiations as early as possible to ensure that all necessary cross-border coordination agreements will be finalized at the latest by the end of 2017, taking into account the 3 year period envisaged by the RSPG Report “on proposed spectrum coordination approach for broadcasting in the case of a reallocation of the 700 MHz band”. Member States should apply guidelines of the RSPG Report referenced above

Ericsson is of the view that there is some urgency in establishing an early regulatory framework while having in place cross-border coordination agreements during year 2015 as there are before now indications of congestion in the band 800 MHz in remote areas with larger cell structures in countries having made the band available at an early stage in the European process. Also EU countries should keep in focus the political goals of providing 30 Mbps to all citizens by the year 2020. To meet this political goal the band 700 MHz represents an important building block.

6. RSPG recommends those Member States with non-EU neighboring countries to start bilateral negotiations with those countries as early as possible to reach the necessary cross-border coordination agreements

Ericsson is of the view that early negotiations with non-EU neighboring countries are a prerequisite for a harmonized approach in EU for the band 700 MHz to be made available to entertain European consumers in a timely manner with MBB services and applications.

7. RSPG recognizes that the DTT platform evolves to new broadcasting technologies in the UHF band (i.e. DVB-T2 and/or possibly HEVC) and recommends that the European Commission should, in cooperation with Member States support national measures to facilitate transition to more spectrum efficient technology, including those mandating the inclusion of such technologies in the TV receivers

Ericsson is of the understanding that in some countries with a low penetration of viewing and usage of TTV services it may not be necessary to update the current TTV platform as it remains difficult to explain the merits of DVB-T2 to the TTV consumers as the added value might not be significant enough. In such circumstances a migration to satellite TV (STV), cable TV (CTV) or IPTV should be considered with an aim of releasing spectrum for MBB services. However, in countries with significant number of viewing and TTV usage, a migration to DVB-T2 and HEVC could be considered as to provide for a soft and smooth transition to MBB in the band 700 MHz as well as in range 470 – 694 MHz.

However, a justification for a migration to DVB-T2 would be the improved capability to operate a single frequency network (SFN), which would improve the spectrum efficiency significantly.

8. RSPG recognizes that the band 470-694 MHz is mainly used for downstream audiovisual content distribution and recommends that it remains as such for the long term, even beyond 2030

Ericsson is of the understanding that a soft migration is achievable if a complementary MBB SDL is considered for the range 470 – 694 MHz as means for flexible transitional arrangements which would be allowing the current TTV to continue to operate using the current TTV configuration unchanged. Ericsson is of the view that the demand for TTV beyond year 2025 will be very limited in many European countries subject to the rapid change in viewing behavior among young and middle aged consumer groups.

9. RSPG recognizes the importance of the DTT platform and the need to provide certainty for investments in broadcasting infrastructure. Therefore RSPG recommends that the frequency band 470-694 MHz shall remain available for DTT in the foreseeable future, i.e. 2030

Ericsson is of the understanding that the demand for TTV beyond year 2025 will be very limited in many European countries subject to the rapid change in viewing behavior among young and middle aged consumer groups (ages 16 – 45 years). Ericsson is of the view that TTV could remain in the band as long as the TTV service is regarded as viable; however, the range 470 – 694 MHz should also be made available in parallel to the MBB service as for countries to choose a pace of migration from TTV to MBB. Ericsson is further of the view that the spectrum situation alone is not enough to provide certainty for investments in broadcasting infrastructure; also, it is essential to better understanding the current level competition from STV, CTV and IPTV. Yet again, there might still be some questions that need to be comprehensively addressed before considering large scale investments in TTV while at all times being conscious of the ongoing downturn in TTV viewing. Therefore the importance of the TTV platform should not be overstated, but having reasonable and balanced expectation on the consumer demands for future TTV services.

While considering a possible delayed introduction of MBB beyond 2025 in the band 470 – 694 MHz there might be a risk for Europe of falling behind the neighboring regions such as the expected incentive auction planned in the USA for the band 600 MHz expected in year 2016.

10. Notwithstanding, the RSPG recommends that Member States should have the flexibility to use the 470-694 MHz band for WBB downlink, provided that such use is compatible with the broadcasting needs in the relevant Member State and does not create a constraint on the operations of DTT in this band, including for neighboring countries

Ericsson is of the view that the TTV platform could remain in the band as long as the TTV service is regarded as viable; however, the range 470 – 694 MHz should also be made available in parallel to the MBB service as for countries to choose a pace of migration from TTV to MBB. Accordingly, policy makers would be invited to consider a co-primary “generic” mobile allocation for terrestrial use in the range 470 – 694 MHz. It is indeed a pressing need to have such co-primary allocation implemented in the ITU Radio Regulations at the World Radiocommunication Conference 2015 (WRC-15).

11. RSPG recommends that, when considering any options for the future usage of the frequency band 470-694 MHz, aspects such as the requirements, technological developments, consumer behavior, the importance of delivering free-to-air television and the various political, social, cultural and economic general interest objectives when this is achieved through the DTT platform, should be taken into account

Ericsson is of the understanding that most, if not all, expectations can be met by MBB systems using the LTE standard including the “free-to-air” requirement (which by many EU citizens is currently

paid for through national taxes or fees). Audio-visual content over MBB networks using the LTE standard could be delivered either unconditionally as a free-to-air service or via the normal conditional access; a free-to-air service could be made possible for unencrypted content, which could be received on a LTE user device without a so called SIM card; or a SIM card that may be specifically configured by the service provider to enable access only to the audio-visual content which can also provide access to free-to-air services. However, the regulatory, operational and business aspects need to be further addressed. MBB as a future TTV platform is regarded to be complementary to the current TTV platform, and further in to the future being complementary to the STV, CTV and IPTV services. Additionally to the range 470 – 694 MHz, any future need to carry UHD TV content over a terrestrial TV platform could be handled over LTE networks by moreover using spectrum in higher bands of the allocated spectrum all the way up to the frequency 3800 MHz.

12. The RSPG believes that there is a need to have technically appropriate and sufficient spectrum for PMSE and consider that depending on developments and requirements of such services, there could be a need to identify additional spectrum. RSPG encourages the PMSE industry to develop more advanced and spectrum efficient technologies. In addition Member States should also seek to promote spectrum sharing and ensure that license conditions in bands currently used are as flexible as possible

Ericsson refrains from having a view on this point.

13. RSPG recognizes that the mechanism of possible compensation is a national issue. RSPG recommends that the commission assists the transition by providing early guidance to the relevant Member States, in particular clarifying cases where it would not be compatible with state aid rules

Ericsson refrains from having a view on this point.

14. RSPG recognizes that implementation of broadband PPDR networks is a national issue

Ericsson is of the understanding that PPDR is not only to be regarded as nation issue as there is need to coordinate both on technology using the LTE technology and operational aspects, also there is a need to establish some requirements for the spectrum bands to be used by the PPDR users in Europe. Such that, as a minimum, the bands 800 MHz, 700 MHz and the blocks 698 – 703 MHz paired with 753 – 758 MHz are coordinated subject to national circumstances and needs as well as the blocks 693 – 698 MHz paired with 748 – 753 MHz, 688 – 693 MHz paired 743 – 748 MHz and 683 – 688 MHz paired with 738 – 743 MHz could be optionally specified for possible use in Europe, again subject to the national circumstances and needs.

15. RSPG notes that TV receiver standards should take full account of the evolution of the 700 MHz band and include as early as possible appropriate receiver parameters (e.g. selectivity and blocking). Therefore, RSPG recommends that the Commission liaises with ETSI and CENELEC to ensure that the new development in the 700 MHz band will be fully taken into account when writing or revising EMC and “radio” harmonized standards for TV receivers and for any other electronic products (such as antenna mast amplifiers) intended for TV installations.

Ericsson is of the understanding that such procedure could be regarded as appropriate.