

ERICSSON SUBMISSION TO THE ICASA DRAFT FREQUENCY MIGRATION REGULATION AND RADIO FREQUENCY MIGRATION PLAN



1 Introduction

Ericsson welcomes the opportunity to submit written comments to the Draft Frequency Migration Regulations and Radio Frequency Migration Plan published in Notice No. 606 of 2012, Government Gazette No. 35598 of 17 August 2012. We would also appreciate the opportunity to make oral submission not exceeding one hour pursuant to this submission.

Ericsson is the world's leading provider of technology and services to telecom operators. Ericsson is the leader in 2G, 3G and 4G mobile technologies, and provides support for networks with over 2 billion subscribers and occupies pole position in managed services. The company's portfolio comprises of mobile and fixed infrastructure, telecom services, and software, broadband and multimedia solutions for operators, enterprises and the media and broadcasting industry.

As the world's leading technology provider, Ericsson plays a key role in the development of standards in fixed, wireless and mobile voice, data and video technologies, enabling and empowering the convergence process with technological means and solutions.

Ericsson congratulates the Independent Communications Authority of South Africa (the Authority) for a great job in identifying additional spectrum that can be made available for International Mobile Telecommunications (IMT). We appreciate the views espoused in the document and we support the "pro-harmonization spirit" of this draft regulation.

The availability of additional spectrum, utilizing internationally harmonized arrangements is very important towards addressing the South African government's ambition for ubiquitous broadband coverage for all.



2 General comments

Ericsson supports the goal of reaching globally harmonized spectrum utilization to the extent possible, aligning with International Telecommunication Union (ITU) policies, regional radio frequency spectrum plans¹ and espousing proven international best practices. This would best facilitate the introduction of high capacity mobile broadband access services for “all and everywhere” and provide for economies of scale and affordability to consumers.

The cost of mobile communication devices has come down significantly over the last decade or two, particularly the GSM/HSPA based devices, thanks to international harmonization of spectrum, economies of scale have been realized.

Mobile broadband is now a reality and as the Internet generation is accustomed to having broadband access wherever they go and not just at home or in the office. Out of the estimated 3.4 billion people who will have broadband by 2014, about 80% will be mobile broadband subscribers – and the majority of these will be served by HSPA and LTE (Long Term Evolution) networks.

2.1 More spectrum for mobile broadband

In its final report to the President in November 2011, the National Planning Commission (NPC) stated: *“Spectrum allocation is perhaps the biggest regulatory bottleneck in the proliferation of rapidly deployable wireless technologies to meet the diverse needs of the society and economy.”*²

The effort undertaken by the Authority through this draft regulation to identify and consolidate valuable spectrum for IMT and mobile broadband indicates that the Authority is mindful of the scarcity of this limited resource and is actively plotting the quest for viable solutions.

¹ Harmonization with the Southern Africa Development Community Frequency Allocation Plan (SADC FAP)

² National Development Plan, p174 (Chapter 4, Economic Infrastructure), NPC, 2011.



Having said that we congratulate the Authority's endeavor to identify additional spectrum for IMT.

The drive to identify and make available additional spectrum is consistent with global trends and necessary to address South Africa's challenges. During October 2010, the American National Broadband Plan recommended that the Federal Communications Commission (FCC) make available 500 MHz of new spectrum for mobile broadband.³

Wireless technologies will continue to be the plausible access solution to broadband delivery for the foreseeable future, especially in the sparsely populated remote areas, this probably explains why spectrum demand far outstrips supply.

According to a recent study by Ericsson, Arthur D. Little and Chalmers University every 10% incremental broadband penetration delivers 1.38 percentage point incremental GDP growth. At current GDP levels, this translates into approximately R58bn.⁴

The findings discussed above square with the GSMA's assessment on the economic impact of wireless broadband in South Africa which suggests that we can reach 20% wireless broadband penetration by 2015 (compared to the 5% in 2010) and potentially generate R72bn incremental GDP and roughly 28,000 jobs in the industry and 2 to 3 jobs in other industries.⁵

2.2 3GPP technologies

The estimates above can only materialize with more spectrum being released to mobile broadband. Mobile and wireless broadband technologies such as 3rd Generation Partnership Project (3GPP) family successfully operates across wide ranging spectrum bands, offering interoperability and backward compatibility among the standards.

³ American National Broadband Plan, Chapter 5: Spectrum, at www.broadband.gov

⁴ See also World Bank 2009 and the DoC Strategic Plan 2012-2017.

⁵ Assessment of economic impact of wireless broadband in South Africa, Analysis Mason Report for GSMA, November 2010.



The latest additions to the 3GPP family are the LTE and LTE-Advanced standards, to date there are 96 commercial LTE networks in 46 countries.⁶ The primary drive towards LTE from operators is the need for more capacity, performance management and improved efficiencies to lower the unit cost of delivering traffic.

These newer technologies require wider bandwidths of 20 MHz in order to achieve downlink peak rate of at least 100 Mbps. One of the beauties of LTE is its spectrum flexibility feature and ability to operate in existing, new and re-farmed spectrum bands.

2.3 Heterogeneous networks - efficient use of spectrum

Ericsson will meet this challenge with a heterogeneous network solution building on a strong interaction between every element in the radio access network and backhaul, thus providing both performance and cost efficiency. The key is to use available spectrum in the most efficient way.

The first step in this approach is to improve the existing macro layer using our lineup of new digital units, radio units and antenna configurations in existing sites. This is an attractive way to increase coverage, capacity and data rates as it doesn't require new sites.

The second step is densify the macro layer by adding more small, lightweight macro cells that installs on walls or poles. This keeps the total number of sites relatively low resulting in low total cost of ownership.

The third step is to add small cells in additional layers as a complement to the macro layer. The small cells may be based on 3GPP standard (micro cells, pico cells or low-power remote radio units, RRU's) and Wi-Fi. The performance will depend on how strong the small cells can be integrated with the macro network.

⁶ Global mobile Suppliers Association (GSA)



A heterogeneous network – based on a 3GPP-standardized and coordinated radio network with integrated Wi-Fi, advanced traffic management and high-performance backhaul – can help deliver a consistent, high-quality and seamless mobile broadband experience.

More spectrum will be required in the heterogeneous networks, from improving the macro sites through more spectrum, to adding small cells such as the picos. New bands such as the 3.5GHz and higher have been earmarked for these applications.

3 Specific comments

3GPP Band 1 (1920-1980 / 2110-2170 MHz) and Band 3 (1710-1785 / 1805-1880 MHz) are conspicuously missing from the list of IMT spectrum bands that are highlighted and comprehensively addressed in the draft regulation. These bands form part of the IMT family and Band 3 is emerging as one of the favorable bands for early LTE deployment.

Ericsson would like to confirm if there is any particular reason for this omission or if this is just an oversight.

3.1 Section 1.2.3 “Spectrum re-farming”

The Electronic Communications Act 36 of 2005 (“the ECA”) is a convergence legislation which takes account two major principles: technology neutrality and services neutrality.



Technology neutrality is based on the premise that service providers and network operators should be allowed to use the technology that best meets the needs of their network and the demands of their customers; such choices should not be dictated to by governments.⁷

Service neutrality is based on a similar premise that network operators should be allowed to provide whatever services their technology and infrastructure can deliver.

Ericsson submits that the use of terms such as a “GSM operator” or reference to any other operator through whatever technology they may be utilizing at a particular point in time may be problematic. Furthermore, we propose that any reference to operators should be confined to the framework provided in the ECA, such as Electronic Communication Network Service (ECNS) or Electronic Communication Service (ECS) licensee.

According to the latest ITU recommendation⁸ on spectrum redeployment as a method of national spectrum management, the following definition is recommended:

*“Spectrum redeployment (spectrum **refarming**) is a combination of administrative, financial and technical measures aimed at removing users or equipment of the existing frequency assignments either completely or partially from a particular frequency band. The frequency band may then be allocated to the same or different service(s). These measures may be implemented in short, medium or long time-scales.”*

3.2 Section 1.24 “Other definitions”

Reference is made to Appendix B 1.1.7 within the draft regulation; we seek clarity on this matter as this section could not be located in said document.

⁷ Broadband Strategies Toolkit, 3.2.1 Technology and Service Neutrality

⁸ Recommendation ITU-R SM.1603-1, approved this year (09/2012): Spectrum redeployment (also referred to as “refarming”) is a method of national spectrum management



3.3 Section 3.1 “Identification of Bands are subject to Frequency Migration”

Ericsson supports the endeavor to harmonize spectrum internationally, following ITU regulations and regional plans. The Authority must be at the fore-front of promoting harmonized spectrum throughout the SADC region and the continent at large, consistently with the need to guarantee effective and efficient use of spectrum, pursuing consumer benefits such as economies of scale and service interoperability.

Ericsson supports in principle the proposed framework.

3.4 Section 4.11.14 “694 – 790 MHz” & 4.11.15 “790 – 862”

Ericsson agrees in principle that a migration plan for these two bands (690 – 790 MHz and 790 – 862 MHz) should be concurrently defined and all Studio Links and Self Help Stations be migrated to appropriate frequency bands.

Given the overlapping nature of these bands and the need to define a co-existence plan for them, it is imperative that they are dealt with in entirety and not in a “piecemeal” fashion.

The co-existence plan should also include the 3GPP Band 5 or the band commonly referred to as the CDMA850 (824-849 / 869-894 MHz) as this band is also utilized in the country.

It is also worth noting that at the time of publishing the “Draft ITA for 800 MHz and 2.6 GHz”,⁹ the ITU WRC-12 had not resolved on the issue of the “second digital dividend. Furthermore, the APT700 band plan that is gaining a lot of global attention had not yet been approved as a 3GPP band.¹⁰

⁹ Government Gazette 34872: Draft invitation to apply for Radio Frequency Spectrum License to provide mobile broadband wireless access service for urban and rural areas using the Complimentary Bands, 800 MHz and 2.6 GHz

¹⁰ 3GPP Band 28: 703 – 748 // 758 – 803 MHz



This ITA¹¹ seems to have been overtaken by the events, and therefore a new proposal on the “expanded” digital dividend would be in order.

Ericsson appreciates the different timings of the availability of the 700 and 800 MHz, however in the interest of providing regulatory certainty and ensuring wider benefits for the South African consumers, we respectfully submit that these two bands be considered jointly.

3.5 Section 4.11.16 “862 – 890 MHz”

According to the draft regulation, the band 880 – 890 MHz paired with 925 – 935 MHz¹² is “currently assigned to Neotel.” On the other hand, the “Spectrum Usage & Spare Broadcasting Frequencies Q1 – 2012” available on the ICASA website¹³ lists Cell C, MTN and Vodacom as the only operators licensed in the 3GPP Band 8 (880-915 / 925-960 MHz). We seek clarity on this matter and we agree that the entire band should be designated to IMT.

3.6 Section 4.11.17 “890 – 942 MHz”

According to the draft regulation, the band 890 – 915 MHz paired with 925 – 935 MHz is “currently assigned to Cell C.” On the other hand, the “Spectrum Usage & Spare Broadcasting Frequencies Q1 – 2012” available on the ICASA website states that the three operators in the 3GPP Band 8, each has 2 x 11 MHz. The reported assignment in the draft regulation is also at odds with the normal symmetric Frequency Division Duplexing (FDD) or paired spectrum and the normal band plan. We seek clarity on this matter.

¹¹ Government Gazette 34872

¹² This band is formerly known as the Extended GSM band or E-GSM

¹³ <https://www.icasa.org.za/LegislationandRegulations/RadioFrequencySpectrumLicencingUsage/SpectrumUsageandAvailability/tabid/394/ctl/ItemDetails/mid/1288/ItemID/1180/Default.aspx> (accessed on 11/10/2012)



3.7 Section 4.11.18 “942 – 960 MHz”

Ericsson submits that any reference to a particular allocation using any specific technology is not sustainable, is problematic and flies in the face of technology neutrality.

Technology and market evolution has allowed the operators, referred to in this section as GSM operators, to migrate and evolve to newer, faster and high data capacity technologies without too much bureaucratic red-tape.

Evolved High Speed Packet Access (HSPA+) operating in the 900 MHz band is now a reality in South Africa, thanks to technology and market evolution. It can only be proper that regulation should also evolve and not become an impediment.

According to the ITU Recommendation ITU-R SM.1603-1 the reasons for redeployment or “re-farming” may include but not limited to the following:

- a) *a spectrum allocation may have been in operation for a considerable period of time and currently no longer matches the demands of users, or the capabilities of modern systems;*
- b) *an allocation within a specific range of frequencies is required for a new radio service and these frequencies are occupied by services with whom the new service cannot share;*
- c) *a decision by a WRC to allocate a currently-occupied frequency band to a different service on a regional or global basis.*

There may be an additional requirement to re-engineer the band in order to improve spectral efficiency.



3.8 Section 4.11.29 “2500 – 2690 MHz”

Ericsson agrees with the proposal that this band should be allocated to IMT and we humbly implore the Authority to consider “Option 1” of the band plans¹⁴ recommended by the ITU and harmonized globally.



Figure 1: Harmonized 2600 MHz band plan

We seek clarity on the Sentech spectrum as stated in the draft regulation.

¹⁴ Recommendation ITU-R M.1036-4 (03/2012): Frequency arrangements for implementation of the terrestrial component of International Mobile Telecommunications (IMT) in the bands identified for IMT in the Radio Regulations (RR)