



UMTS
Forum

UMTS Forum response to the ARCEP consultation on the challenges tied to new frequency bands for electronic communication services access networks

The UMTS Forum represents a significant group of spectrum users, which are directly interested in the development of public mobile communication networks including UMTS/IMT-2000 and, especially, the related spectrum topics. UMTS Forum gathers many different players involved in third generation (3G) mobile communication systems, including equipment manufacturers, operators, administrations, service providers and software developers.

The UMTS Forum welcomes the opportunity to respond to ARCEP public consultation on the challenges tied to new frequency bands for electronic communication services access networks.

Please find below the UMTS Forum comments regarding specific aspects of this public consultation: the importance of low frequency bands for offering mobile broadband services, the role of Digital Dividend and UMTS Forum works for harmonizing a Digital Dividend sub-band.

1. Mobile Broadband Services based on 3G/UMTS are a reality today

Rapid growth in the uptake of IMT-2000 services continues globally, with more than 180 commercial 3G/UMTS networks now operating commercially in around 80 countries. As of September 2007, there were over 160 million subscribers to 3G/UMTS networks.

By mid-2007, more than 120 mobile operators had already deployed HSDPA (High Speed Downlink Packet Access) commercially in over 60 countries, giving their customers access to even higher data rates and exciting new service possibilities. Of this total, a growing number of HSDPA networks support the higher bit rate of 3.6 Mbps. Global HSDPA subscriptions, meanwhile, had already exceeded 7 million by mid-year. HSDPA networks supporting data rates of 7.2 Mbps are also starting to be deployed.



In the same timeframe, at least two operators had commercially introduced HSUPA (High Speed Uplink Packet Access) networks, providing a corresponding boost to uplink data speeds.

There is already an extensive choice of more than 900 UMTS devices. This includes almost 200 HSDPA devices spanning handheld terminals, PC cards, USB modems and notebook PC cards with embedded SIM cards.

3G/UMTS will be continuously evolving to offer increased data rates with 3GPP WCDMA Release 7 and Release 8 and with LTE (Long Term Evolution). This new technology has the potential to transform how users receive, consume and interact with information and content distributed over mobile networks.

LTE, deployed on a mass market scale, the benefits, not just for individual users, but communities and businesses could be considerable. A super fast, efficient and highly reliable mobile network will support the delivery of a wide range of services to multiple devices, improving not just the user experience, but driving efficiency gains for businesses using mobile services, enabling the rollout of new applications, such as M2M (machine to machine) and supporting the exchange of information within community-based projects.

2. The mobile market growth will remain strong in the coming years

The UMTS Forum has developed a number of reports and studies on the mobile market growth and future spectrum needs. Those reports are:

- Report 40 "*Development of spectrum requirement forecasts for IMT-2000 and systems beyond IMT-2000 (IMT-Advanced)*"
- Report 38 "Coverage Extension Bands for UMTS/IMT-2000 in the bands between 470-600 MHz"
- Report 37 "*Magic Mobile Future 2010-2020*"
- Report 33 "*3G Offered Traffic Characteristics*"
- Report 35 "*Mobile Market Evolution and Forecast: Long term sociological, social and economical trends*"
- Report 31 "*UMTS Next Generation Devices*"

For the year 2010, UMTS Forum Report 33 "3G Offered Traffic Characteristics" estimated a total daily traffic of 249 Tbytes (for a representative European country of 52.3 million users), which results in 4.8 Mbytes/users/day. Furthermore, Report 37 "Magic Mobile Future 2010-2020" estimated for the year 2020 the total daily traffic to be 5744 Tbytes, which results in 495 Mbytes/users/day as shown in next Figure.

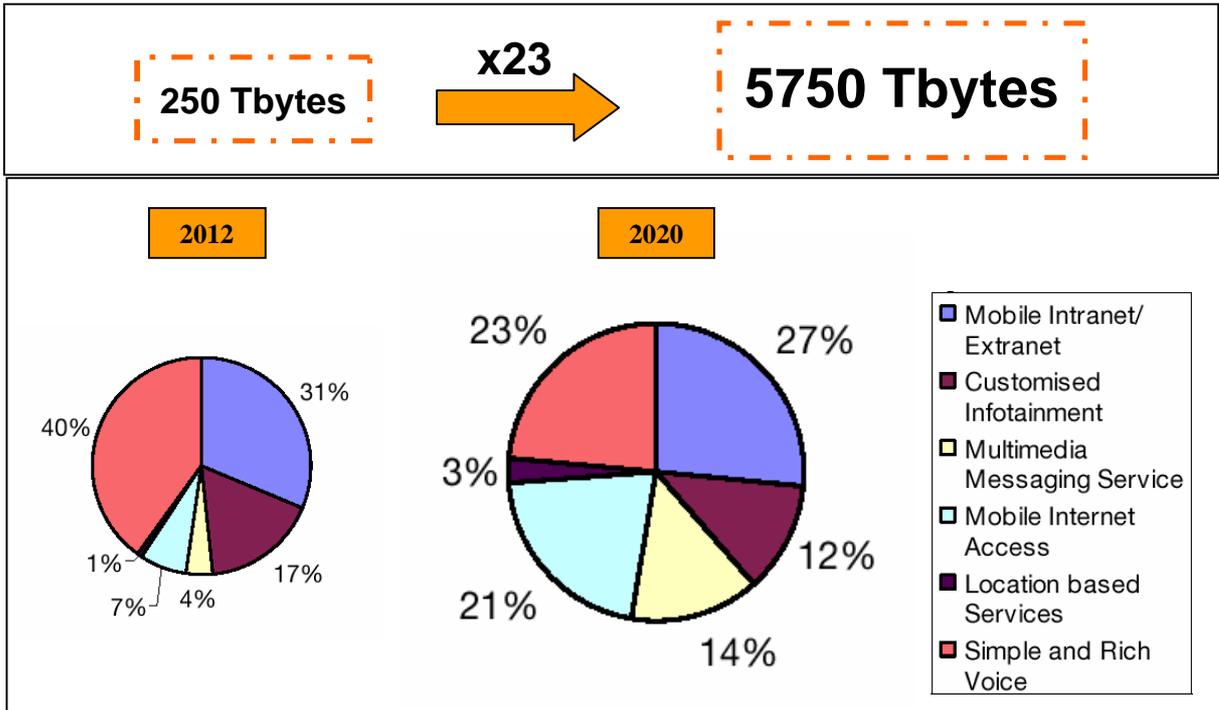


Figure 1: Total estimated daily traffic and its distribution to different service categories for a representative Western European country: year 2012 versus 2020

3. Spectrum for Mobile Broadband Services

It is expected that IMT-Advanced technologies will be about 10-15 times¹ more spectrally efficient than today's mobile technologies. However, these developments cannot alone solve the forecasted spectrum demand. The expected improvement in spectrum efficiency is not high enough to fulfil the traffic needs. Furthermore, the requirement of harmonised spectrum remains important for the next decade and beyond.

With over 160 million IMT-2000/UMTS subscribers, UMTS Forum believes that the band 2500-2690 MHz will be extremely important for the extension of capacity of IMT-2000/UMTS networks to offer evolving services in the next few years to come.

Moreover, the 2.6 GHz band will also offer a unique opportunity for the deployment of IMT-2000/UMTS, like the LTE (Long Term Evolution) in channels of up to 20 MHz, which allows the provision of very high data rate services. A harmonised channeling arrangement for the 2.6 GHz is equally of extreme importance as it enables economies of scale, facilitates interference free operation and global roaming. The UMTS Forum supports the harmonised band plan adopted by CEPT in ECC DEC(05)05 and which comprises of 2x70 MHz of paired

¹ Based on the figures in ITU-R WP8F Reports M.2078[IMT.ESTIMATE] and M.2074[IMT.RADIO_ASPECTS]



spectrum (for FDD operation) and 50 MHz of unpaired spectrum (for TDD or FDD downlink operation) giving ample spectrum to facilitate both FDD and TDD operations and a flexible support of asymmetric traffic situations. The UMTS Forum is greatly concerned with regards to the plans of some European countries to divert from the harmonised FDD/TDD European band plan. An approach to implement a specific national FDD/TDD band plan, without any coordination at CEPT level, will fragment the European market for mobile broadband services and will create technical and investment uncertainties in the marketplace.

For allowing IMT-Advanced deployment, the 3400-4200 MHz band offers the best potential to fulfil most of the expected capacity demand due to its size. This band could also accommodate IMT-Advanced systems which are envisaged with large carrier bandwidths, up to 100 MHz.

However, these bands need complementary spectrum in lower frequency bands (<1GHz) in order to achieve Mobile Broadband Services everywhere: a harmonized sub-band of the Digital Dividend becomes essential.

4. The Digital Dividend will enable Mobile Broadband Services everywhere

GSM subscriber numbers, traffic and coverage are increasing strongly. However, in 2007 many growth markets still have mobile coverage limited to main cities. These markets should be particularly addressed in the short-term with optimised and enhanced GSM and IMT-2000/UMTS solutions for affordable provisions of voice, text messaging and internet connections. In the medium and longer term, there is a need for very cost effective IMT-2000/UMTS coverage solutions, business models and affordable devices.

Due to lack of lower frequency bands (<1GHz), large geographical areas with low population density are dispossessed of access to mobile multimedia services. Consumers want to benefit from the new services on an equal geographical basis. It is a real challenge for network operators to answer these expectations in large areas of low population density since it would require high investment costs.

In addition, the current 900 MHz band is overloaded. This band is nowadays fully used by GSM, and the introduction of IMT-2000/UMTS point clearly out the limited amount of spectrum not only for the coexistence of more than one technology but also for allowing mobile broadband services. After analyzing the capacity of 900 MHz band, it has been demonstrated by mobile operators that it would be impossible to offer an unlimited mobile broadband access service with the sufficient bit rate, even in the most scarcely populated areas.

For this reason, additional spectrum in lower bands is required in order to offer mobile broadband services everywhere, and to bridge the digital divide between urban and rural areas. Hence, Analog TV switch off spectrum in the UHF band and resulting Digital Dividend represents the only chance for releasing the appropriate additional spectrum below 1GHz for mobile use: a sub-band of around 100MHz.



Moreover, the UMTS Forum strongly believes that the harmonisation of the Digital Dividend is a prerequisite to facilitate interoperability and global roaming allowing UMTS/IMT-2000 usage; worldwide spectrum harmonisation will allow economies of scale and consequently low cost mass-market equipment.

5. The UMTS Forum and the Digital Dividend

During the last years the UMTS Forum performed studies regarding the identification of a new Coverage Extension Band within 470-862 MHz band for IMT-2000/UMTS, to cover part of WRC-07 Agenda Item 1.4 and its related Resolution 228.

The UMTS Forum studied advantages and disadvantages of the 470-862 MHz and contributed the results to CEPT and ITU, in particular its Report 38 "Coverage Extension Bands for UMTS/IMT-2000 in the Bands between 470-600MHz", and also started a research project about UMTS500. This report showed that lower frequency bands with better radio wave propagation characteristics provide better geographical coverage in a more cost effective way through larger radio network cells. Low frequency bands due to the coverage provision will help to bridge the digital divide between urban and rural areas.

However, the current worldwide framework has shown that a global harmonization in the UHF band could only be possible in the upper part of this band. Moreover, the upper part of UHF band would provide better benefits for mobile operators who are able to reuse 850/900 MHz sites. Hence, in light of the RRC-06 results and taking into account positions expressed by a number of Administrations concerning the Digital Dividend, the UMTS Forum took the decision to focus its studies on the scenario for a harmonised sub-band in the higher part of UHF TV band. In addition, a sub-band in the upper part of the UHF TV band is expected to have less impact (higher part of UHF band is less used) on the GE-06 Plan.

6. A 112 MHz harmonized sub-band in the 470-862 MHz

UMTS Forum has been supporting the CEPT studies related to the feasibility of harmonizing a sub-band on the frequency band 470-862 MHz for UMTS/IMT use. For the UMTS Forum, this frequency band would be essential in the provision of future high bit rate mobile services in a cost effective manner.

In the framework of the CEPT working group on the Digital Dividend (ECC TG4), UMTS Forum has decided to carry out a study about the technical feasibility of releasing a 112 MHz sub-band in the upper part of the UHF band for deploying mobile services.

In June, the UMTS Forum carried out a technical study in order to assess the feasibility to create 112 MHz sub-band while maintaining the national broadcasting services requirements in the remaining 470-750 MHz band, using the country of Belgium as an example. Belgium had been chosen as it is one of the most complex case studies due to several reasons including: a large number of neighbouring countries compared to Belgian size, multilingual

characteristics, flat terrain model and a high number of allotments concentrated in the same place (up to 14 allotments over Brussels).

This first study of one country concluded that it is possible to achieve national broadcasting requirements granted during the RRC-06 with negligible interferences on both Belgian and neighbouring countries' allotments (situated up to 50 km away from the Belgian border) with frequency reassignment of all Belgian GE-06 allotments between the channels 21 and 55 (470 – 750 MHz). More details about this study, the assumptions and methodology can be found in document TG4(07)081.

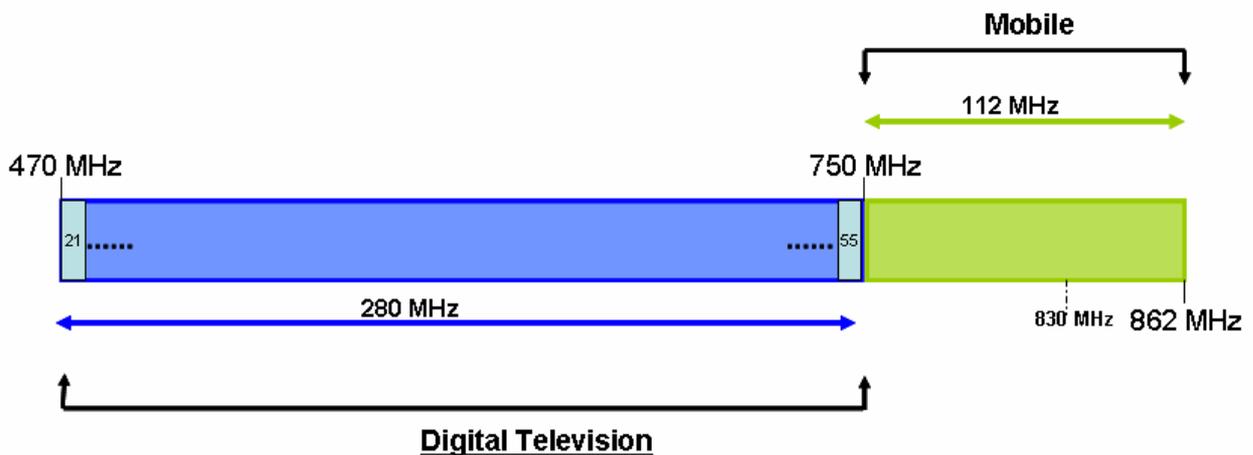


Figure 2: The UHF band with a 112MHz sub-band for mobile use

The aim of this first study was to investigate the feasibility in the case of one Administration for creating a sub-band in the upper part of the UHF band. The study was limited to only one country due to the very tight time schedule of ECC TG4 Report B. However, it was noted that studying only the case in one country did not take into account the difficulties of creating a harmonized sub-band in several countries at the same time.

Hence UMTS Forum decided to go further with its first technical study and to take into account improvements proposed at ECC TG4. This new study would also analyse the possibility of converging through a harmonized sub-band across Europe. In July, UMTS Forum started the evolution of its first study, and results will be presented during next ECC TG4 meeting (2nd-5th October).

This second part of the study is estimating the technical feasibility of creating a sub-band in more than two neighbouring European Administrations. The countries that are studied in this new part are Belgium, France, Holland and Luxembourg. UMTS Forum intention is to show that several Administrations may have a possibility to reassign channels of allotments at the same time, while retaining broadcasting resources obtained in GE-06 and also ensuring protection of broadcasting services in neighbouring countries. For this reason, more than two



countries have been studied and re-planned at the same time, and taking into account their respective border countries. The new frequency assignments of these countries, that would allow the harmonization of a sub-band for mobile services, would also protect their neighbouring countries' GE-06 Plan up to 130 km from their border.

The UMTS Forum has carried out these studies to show an alternative frequency plan of the UHF band in Europe, in which the current number of digital TV layers, as in the GE-06 Plan, could be provided and, at the same time, a harmonised digital dividend of around 100 MHz could be found.

7. WRC-07 is the right time to identify the new spectrum for IMT

The global spectrum harmonisation and the regulatory clarity achieved for IMT-2000 at WARC-92 and WRC-2000 have resulted in many successful UMTS/IMT-2000 deployments to the benefit of consumers globally who enjoy affordable services and terminal devices.

However, for WRC decisions, it has typically taken around a decade between the time when the spectrum is identified and when it is made available/licensed. A WRC-07 decision would enable IMT-Advanced deployment in the timeframe of 2015-2020. This is the right timing, based on the ITU studies and on UMTS Forum's own market studies.

Concerning the specific usage of the UHF for mobile services, a WRC-07 decision is crucial to enable the deployment and extend the coverage of IMT-2000 and IMT-Advanced in harmonised spectrum after analogue switch off in 2011-2012 timeframe. Also, licensing of digital TV is on-going in many countries and soon the opportunity for the mobile use is gone. The UMTS Forum believes that delay for a WRC-11 will be a missing opportunity for Europe to take advantage of the Digital Dividend. Hence, UMTS Forum states that the candidate band 470 – 862 MHz should be allocated to the Mobile Service and about 100 MHz harmonized sub-band should be identified for IMT in WRC-07.

8. Status of UMTS standardisation in the UHF band outside Europe

3GPP is currently developing WCDMA specifications for the Digital Dividend spectrum identified in the USA in the 700 MHz range. 3GPP is expected to finalize the UMTS 700 MHz specification by December 2007. The auction of the 700 MHz spectrum in the US is due to take place in January 2008.