

UMTS Forum key messages for WRC 2007

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ITU/BDT Regional Seminar

Yaoundé (Cameroon), 18-21 September 2006

WRC-07 priorities for UMTS Forum

- World Radiocommunication Conference (WRC-07) will be held in Geneva from 15 October – 9 November 2007
- Two agenda items are of high importance for UMTS Forum at WRC-07
 - Agenda Item 1.4:
"to consider frequency-related matters for the future development of IMT-2000 and systems beyond IMT-2000 taking into account the results of ITU-R studies in accordance with Resolution 228 (Rev.WRC-03)"
 - Agenda Item 1.9:
"to review the technical, operational and regulatory provisions applicable to the use of the band 2 500-2 690 MHz by space services in order to facilitate sharing with current and future terrestrial services without placing undue constraint on the services to which the band is allocated"



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Agenda Item 1.4



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WRC-07 Agenda Item 1.4

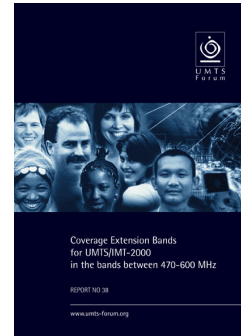
- Agenda Item 1.4 refers to:
 - the advanced high-bit rate services needs in the bands below 5GHz for the future evolutions of UMTS/IMT-2000 and IMT-Advanced
 - and
 - the extended UMTS/IMT-2000 coverage needs in the bands below those already identified for IMT-2000 (Resolution 228)
- Agenda Item 1.4 is of major importance for the UMTS Forum and offers a unique opportunity to identify spectrum for mobile
 - coverage bands below 600 MHz and
 - high-data rate services bands below 5 GHz



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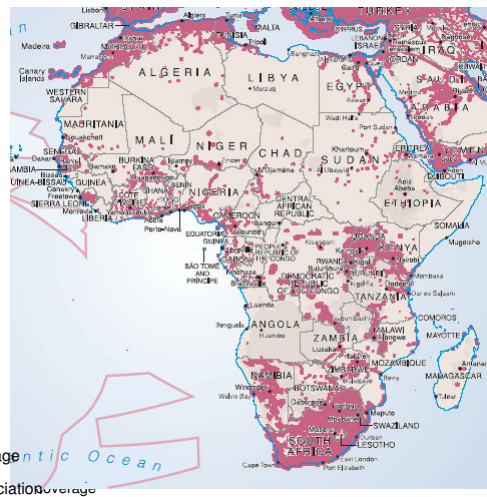
Spectrum for extended UMTS/IMT-2000 coverage



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The reality in growth markets

- GSM coverage is progressing strongly
- However, many growth markets still have in year 2006 a coverage limited to main cities and has no plan for 3G/UMTS due to the current spectrum situation



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Why 470-600 MHz band would provide the best solution for UMTS coverage?



- The range 400 to 470 MHz is fragmented and used by various services (including military, Police, PMR etc)
 - In particular the 450-470 MHz band is **too narrow** for UMTS and other wide band technologies
- The **470-600 MHz band represents a significant coverage improvement**, compared to 2 GHz frequency bands
 - In Europe, analogue TV switch off will free some spectrum which could be used for innovative mobile services
 - In many growth markets TV band is not heavily used (UMTS F Report 38)
 - 2 x 30 MHz is a minimum spectrum to be identified for IMT-2000 (Report 38)



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Digital dividend in Europe: competition for a strategic asset



- Broadcasters use today the whole band 470-862 MHz which is now re-planned by the Regional Radiocommunication Conference (RRC-06) in relation to the digital switchover
- Transition from analogue to digital broadcasting will free some spectrum
 - due to the higher spectrum efficiency of digital technology (factor 4 to 6)
- The released spectrum is called “Digital dividend” and is expected to present a significant amount of spectrum
 - at least 100 MHz – according to UK OFCOM
 - **300 to 375 MHz** of the current amount allocated to terrestrial broadcasting could be freed and become newly available if analogue TV broadcasting is switched to digital transmission (same image resolution and size, same number of channels) – EC Communication September 2005



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The RRC-06 results

- The declaration of 52 countries at the end of the conference provides an opportunity for the possible introduction of mobile applications
 - “... formally declare that their administrations may use their digital Plan entries for broadcasting or other terrestrial applications with characteristics that may be different from those appearing in the Plan within the envelope of their digital Plan entries under the provisions of the GE06 Agreement and the Radio Regulations, and that their administrations agree that any such use will be afforded protection to the levels defined by the interfering field strengths as arising from their digital Plan entries, taking into account any relevant bilateral agreements.”
 - This declaration enables a first introduction of mobile telecommunication applications in the VHF or UHF bands
 - It constitutes a positive step towards the actual use of the digital dividend

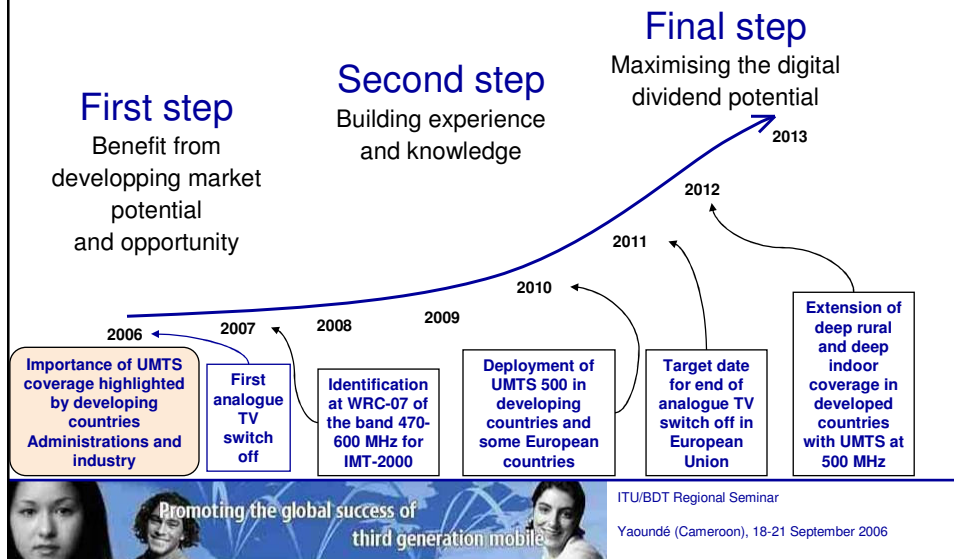


RRC-06 Declaration

- 52 countries signatories of RRC-06 Declaration :
 Democratic Republic of Algeria, the Federal Republic of Germany, the Principality of Andorra, Austria, Belgium, Bosnia and Herzegovina, the Republic of Bulgaria, Burkina Faso, the Republic of Burundi, the Republic of Cameroon, the Republic of Cape Verde, the Republic of Cyprus, the Vatican City State, the Republic of Côte d'Ivoire, the Republic of Croatia, Denmark, Spain, the Republic of Estonia, Finland, France, the Gabonese Republic, Greece, the Republic of Hungary, Ireland, Italy, the Republic of Latvia, The Former Yugoslav Republic of Macedonia, the Principality of Liechtenstein, the Republic of Lithuania, Luxembourg, the Republic of Mali, Malta, the Kingdom of Morocco, the Principality of Monaco, Norway, the Kingdom of the Netherlands, the Republic of Poland, Portugal, the Slovak Republic, the Czech Republic, Romania, the United Kingdom of Great Britain and Northern Ireland, the Republic of San Marino, the Republic of Senegal, Serbia, the Republic of Slovenia, Sweden, the Confederation of Switzerland, the Republic of Chad, the Togolese Republic, Tunisia, Turkey and Ukraine



Agenda for UMTS 500



Conclusions on coverage bands



- There is an opportunity for UMTS-500 at WRC-07 under agenda item 1.4
 - UMTS-500 is the solution to provide 3G services and coverage at affordable costs
 - To be available around 2010, the activities for the harmonisation of UMTS-500 spectrum should start now
- Expected results at WRC-07 concerning lower bands
 - Allocation of the whole 470-862 MHz band to the Mobile Service on a primary basis in all three ITU Regions (this band is already allocated to Mobile Service in Regions 2 and 3) and
 - Global identification of at least 2x30 MHz within the 470-600 MHz band for IMT-2000/UMTS and IMT-Advanced

Promoting the global success of third generation mobile

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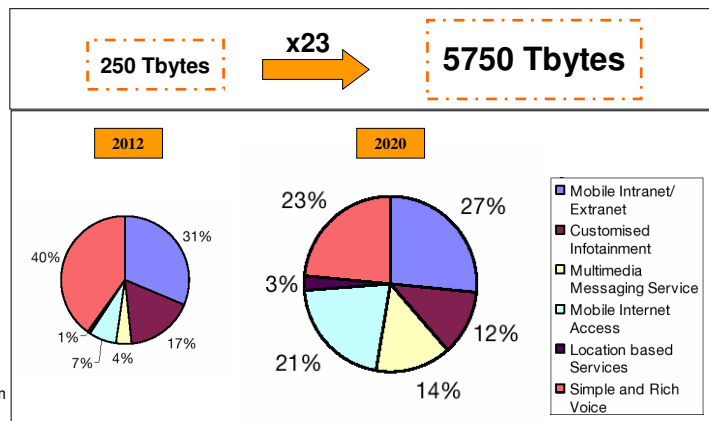
Agenda Item 1.4

spectrum for mobile high-data rate broadband use



Mobile market evolution and growth

UMTS Forum Report 37 "Magic Mobile Future 2010-2020" estimates for year 2020: total daily traffic of 5750 Tbytes and total traffic/subscriber/day of 495 Mbytes



Source: UMTS Forum Report #37



Existing bands are not enough to satisfy the spectrum demand for IMT-Advanced



Mobile applications and services demanding high data-rate access, with foreseen data volumes and 100 Mbps/1 Gbps peak data-rates, cannot perform satisfactorily within today's IMT-2000 spectrum:

- Due to the demand for increased traffic handling:
 - there are practical limitations to the number of base station sites that can be added in a network since there are cost (CAPEX and OPEX) issues and environmental deployment issues as e.g. towers and antennas cannot be built at any location
- Due to the larger bandwidth requirements for new technologies:
 - to meet the expectations and demand, the need for very high data-rates require new radio technologies, which are expected to use wider bandwidths (possibly using 100 MHz wide channels) than commonly available today (like 5MHz wide channels)



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Spectrum demand for IMT-Advanced



UMTS Forum Report #40 :

- Using the traffic forecasts in the Magic Mobile Future, the total demand for cellular spectrum was calculated to be :
1.6 GHz by year 2020 (additional need in Europe > 1GHz)
- Using the traffic forecasts from the "constant change" scenario in the FMS study (the scenario that was used in CEPT's contribution to the ITU-R as European Market Data), total demand was calculated to be :
2.6 GHz by year 2020 (additional need in Europe > 2GHz)

ITU-R WP8F report on spectrum estimate :

- Lower market settings results in total spectrum requirements of **1280*** MHz
- Higher market settings results in total spectrum requirements of **1720*** MHz
(* including spectrum already identified = 585MHz)

Additional need e.g. for Europe **695 MHz** or **1135 MHz**



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Higher data-rates enhance the mobile user experience



The mobile user expects that similar services as in office or home environment should be available also in mobile environment:

- basic mobile voice, video call, and advanced email and messaging services
- information based services and mobile Internet access
- mobile health and educational services
- mobile entertainment, gaming and mobile TV
- e-/m-commerce and mobile bank services, as well as
- e-/m-Government services

100++ Mbps wireless connectivity is needed for good user experience



Bands should be globally common



- IMT-Advanced technologies are expected to be about 10-15 times more spectrum efficient than today's mobile technologies
- Industry is developing new concepts, such as cognitive radios, that would be able to find and use spectrum that is not in use
- However, these developments cannot alone solve the forecasted spectrum demand
- The requirement of harmonised spectrum remains to be an important issue for the next decade

ITU-R WP 8F is conducting sharing studies in the candidate bands:
410-430MHz, 450-470 MHz, 470-806/862 MHz and
2300-2400 MHz, 2700-2900 MHz, 3400-4200 MHz and 4400-4900 MHz



Bands for mobile high-data rate broadband use should be identified globally below 5 GHz



- Based on the ITU-R studies, the preferred frequency bands for mobile high-data rate broadband use should be below 5GHz, due to the radio wave propagation properties and other technical reasons, such as:
 - support for fully mobile services
 - acceptable trade-off between cost and full area coverage
 - availability of required radio frequency (RF) hardware components, complexity and power consumption in user equipment



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WRC-07 is the right time to identify new spectrum for mobile high-data rate broadband use



1. Mobile market growth continues to be strong
2. Higher data-rates enhance the mobile user experience
3. More spectrum will be needed for the very high-data rate IMT-Advanced services as a response to increased traffic
4. UMTS Forum estimates over 40 times increase from today to year 2020
 - EU FMS Smooth Development scenario estimates 30 times increase from 2010 to 2020
 - About 600-1000 MHz of new spectrum will be needed around year 2020 for IMT networks
5. Bands for the very high-data rate IMT-Advanced services should be globally common and be below the 5 GHz. Decision in WRC-07 would enable deployment of the very high data-rate IMT-Advanced services in the timeframe of 2015-2020
6. The harmonisation achieved for IMT-2000 and the current footnotes and resolutions should not be endangered



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- Agenda Item 1.9 refers to the protection of the 2500-2690 MHz band from satellite interference to fully safeguard the global deployment of terrestrial IMT-2000/UMTS
- The band 2500-2690 MHz
 - is allocated to the Mobile Service and has been identified by WRC-00 for IMT-2000 on a worldwide basis
 - Moreover, various satellite services are also allocated in the band, in particular Broadcasting Satellite Service (BSS), Fixed Satellite Service and BSS (sound) service.
 - In Europe, the band 2500-2690 MHz is designated for use for terrestrial IMT-2000/UMTS systems starting from 2008. In the Americas, CITELE recommended that IMT-2000 use of the band 2500-2690 MHz should be limited to terrestrial networks. The band 2500-2690 MHz is extremely important for future capacity extension of terrestrial UMTS networks.



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- Satellite interference could be very detrimental by considerably reducing UMTS networks coverage and capacity
 - Adequate regulatory and technical provisions are therefore needed in the Radio Regulations to ensure the adequate protection of IMT-2000/UMTS systems from satellite interference
- WRC-03 adopted appropriate new regulations under agenda item 1.34 that ensured the protection of UMTS networks from BSS (sound) interference in the band 2605-2655 MHz
- WRC-07 will have to adopt under AI 1.9 new technical and regulatory provisions that ensures the protection of UMTS systems from all other satellite interference in the band 2500-2690 MHz



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- UMTS Forum supports that :

WRC-07 adopt under agenda item 1.9, technical and regulatory provisions that ensures the protection of IMT-2000/UMTS from satellite interference and fully safeguards the future deployment of terrestrial IMT-2000/UMTS deployment on a worldwide level
- UMTS Forum believes that :

the protection of IMT-2000/UMTS from BSS (sound) interference in the band 2605-2655 MHz has been appropriately covered by WRC-03 under agenda item 1.34.



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Conclusion

As an industry we need to ensure:

- **technical and regulatory provisions to protect IMT-2000/UMTS from satellite interference in the 2500-2690 MHz band**
- **that sufficient globally harmonised spectrum is available**
 - to meet long-term growth forecasts for UMTS/IMT-2000 mobile multimedia systems, their evolutions and for mobile high-data rate broadband use (IMT-Advanced)
 - to reduce the digital divide improving UMTS/IMT-2000 coverage within 470-600 MHz bands



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thank you

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