Spectrum issues for IMT-2000

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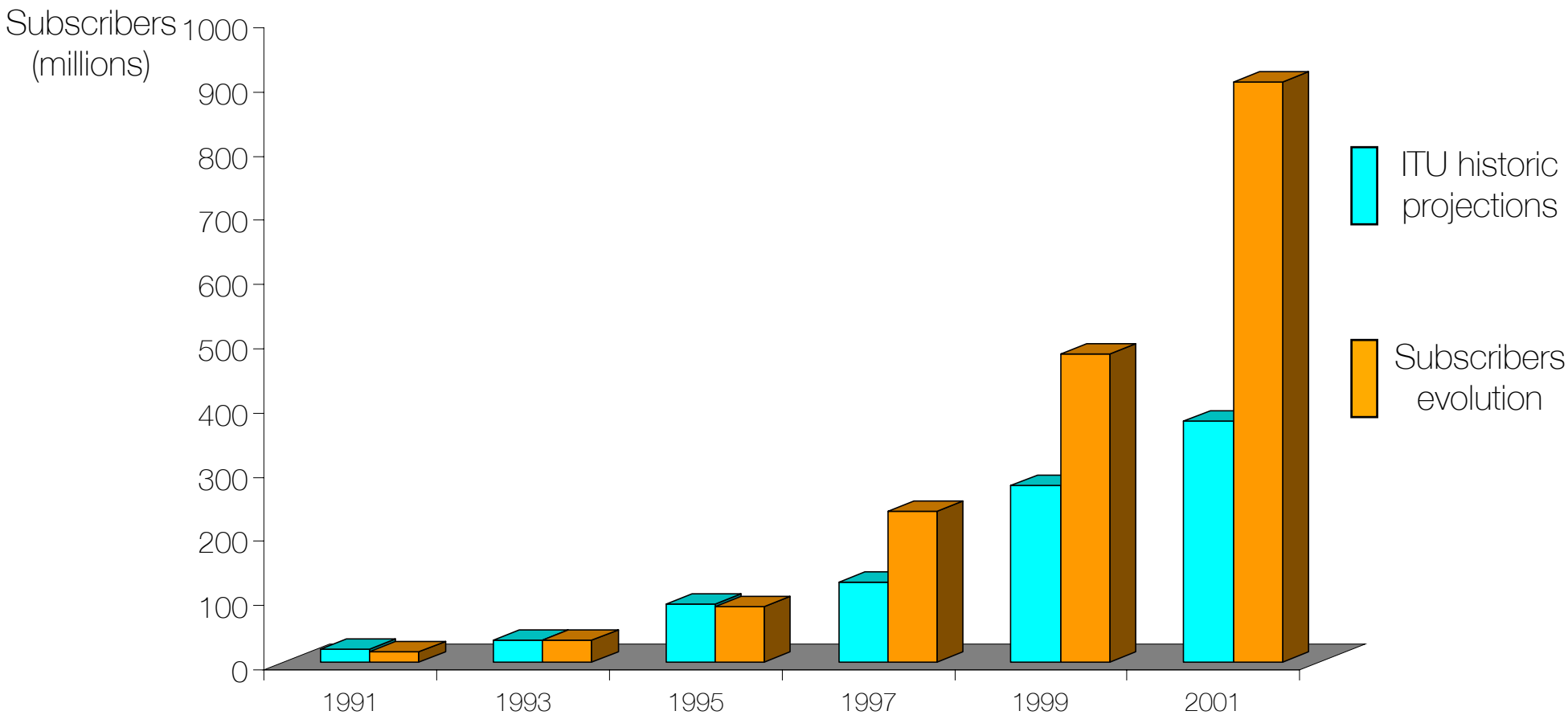
ITU-D IMT-2000 seminar, Doha, 29 September 2003

Summary

- Global mobile market and spectrum worldwide harmonisation
- UMTS/IMT-2000 initial deployment
- UMTS/IMT-2000 extension band for high density populated areas
- Studies for the extension of mobile coverage
- Conclusion

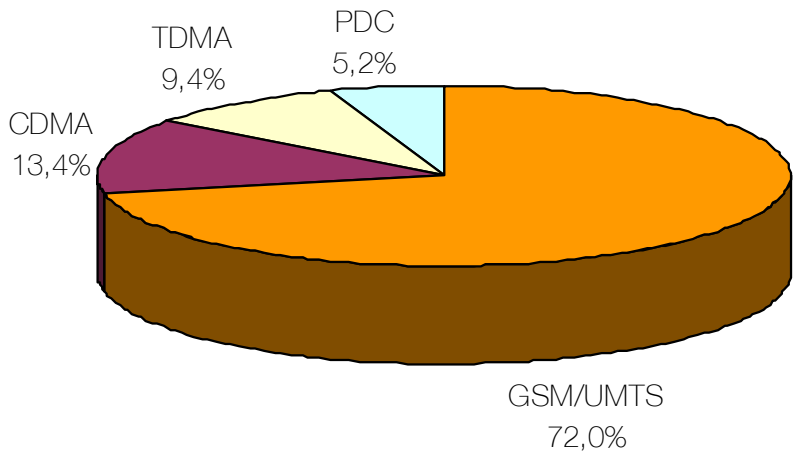
I. Global mobile market and spectrum worldwide harmonisation

Mobile subscribers growth considerably higher than expectations



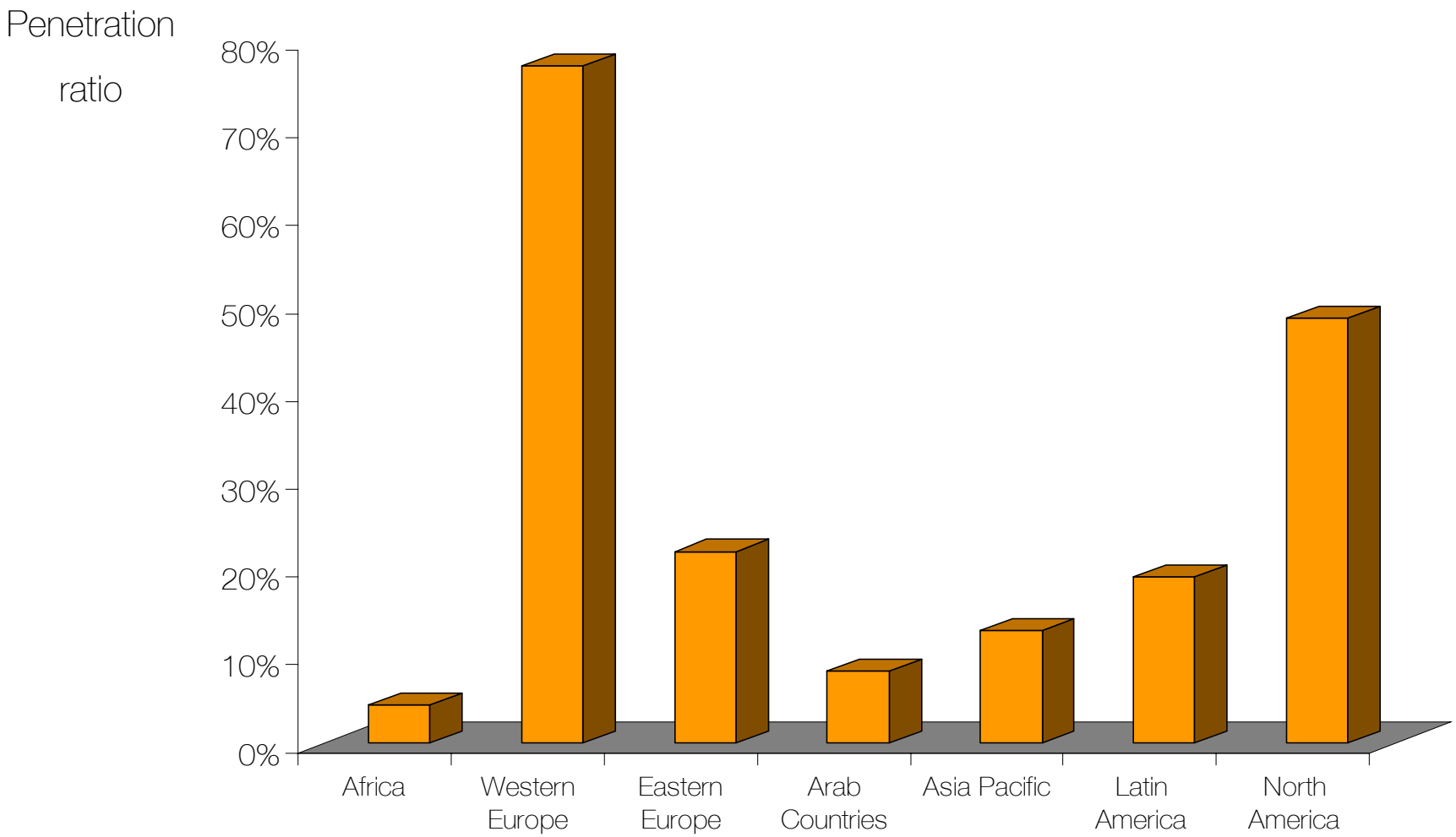
GSM in Arab countries

- Mobile worldwide harmonisation has been achieved around GSM used today by more than 70% of users in the world
- Today GSM is used in all Arab countries, except Iraq
- Natural evolution of GSM networks will lead towards UMTS that will be interoperable with GSM 900 and GSM 1800 allowing dual mode operation and global roaming



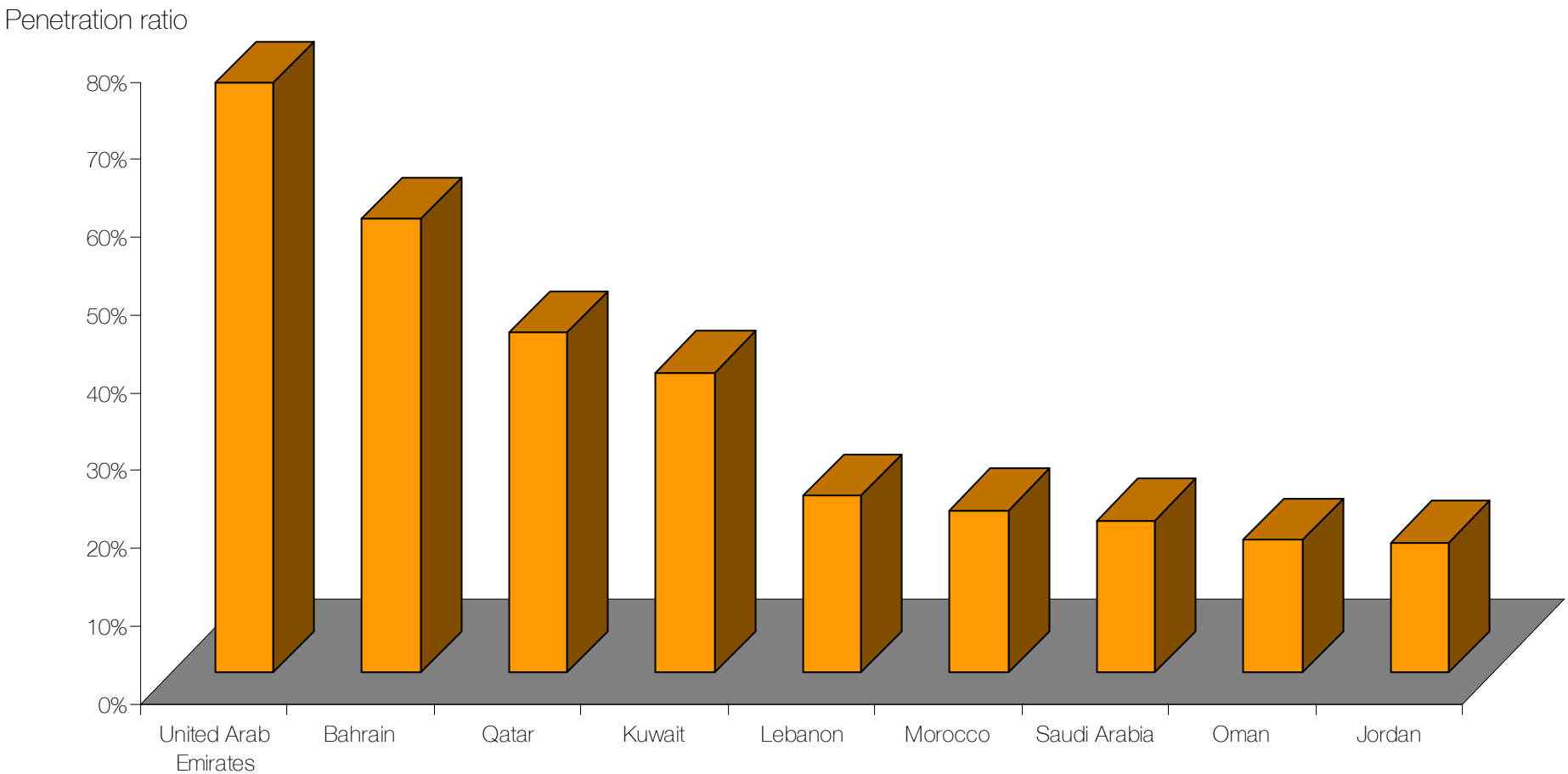
* 2003, Source: UMTS Forum

Mobile penetration ratios per Region



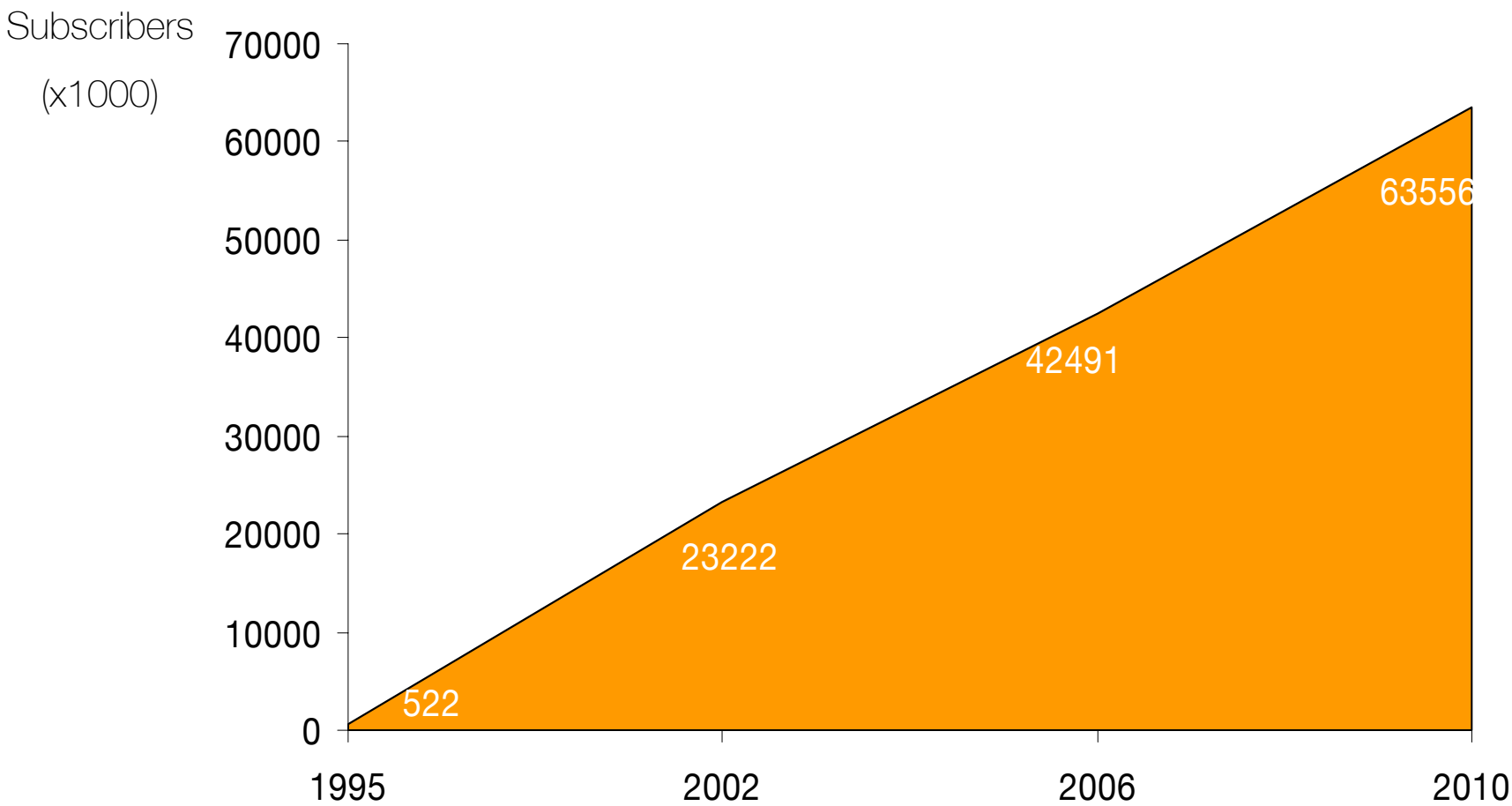
* 2002, Source: Global mobile, ITU

Mobile penetration ratios in some Arab countries



* 2002, Source: ITU

Continuous growth in Arab countries for coming years



* Source: Orange

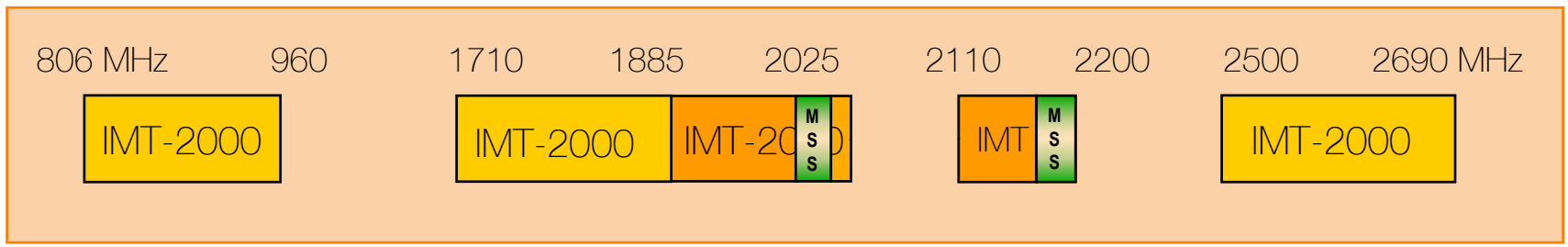
Spectrum allocation process

- Efficient spectrum allocation should be the result of long world-wide level process based mainly on user needs, economical environment and taking benefits of technology evolution:
  - 1st step: designation by international regulatory bodies of a frequency band with involvement of administrations, main manufacturers, main operators and other spectrum users
  - 2nd step: international agreements on harmonised frequency plans in the designated bands, technical standards and equipment design and production
  - 3rd step: effective freeing of the designated bands or part of them as required in each country
  - 4th step: licenses granted to operators to deploy networks using part of the designated bands to offer a given service.

- Spectrum for terrestrial mobile services is like oxygen for human beings

IMT-2000 spectrum

- WARC-92 identified the initial bands for IMT-2000 deployment i.e. 1885-2025 MHz and 2110-2200 MHz also called the core bands
- WRC-2000 identified three additional bands for terrestrial IMT-2000 i.e. 2500-2690 MHz, 806-960 MHz and 1710 – 1885 MHz

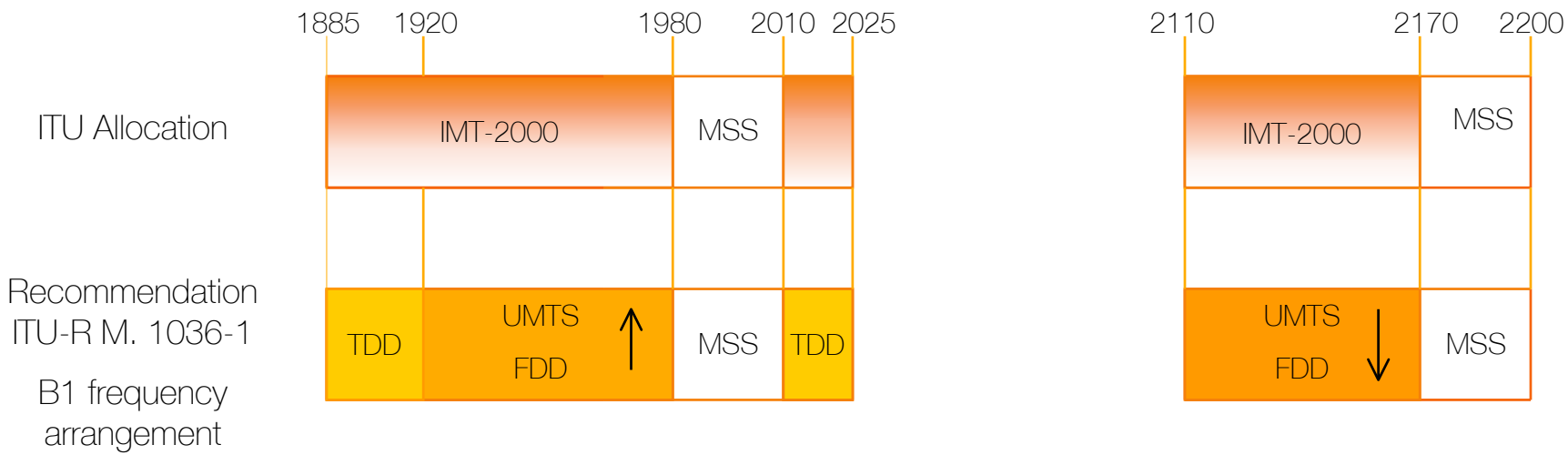


- The Radio Assembly adopted in June 2003 the revision of recommendation ITU-R M.1036-1 "Frequency arrangement for implementation of the terrestrial component of International Mobile Telecommunications – 2000 (IMT-2000) in the bands 806-960 MHz, 1710-2025 MHz, 2110-2200 MHz and 2500-2690 MHz

II. UMTS/IMT-2000 initial deployment

Spectrum for the initial deployment of UMTS/IMT-2000

- UMTS/IMT-2000 will first be implemented in WARC-92 bands in a harmonised manner in most of countries world-wide (Europe, Asia and some Americas countries)
- By mid 2003, approaching 120 UMTS/IMT-2000 licenses were granted worldwide



III. UMTS/IMT-2000 extension band for high density populated areas

UMTS/IMT-2000 extension band for high density populated areas

- The bands 806-960 MHz and 1710-1885 MHz are intensively used by 2G/2.5G networks particularly by GSM/GPRS 900 and GSM/GPRS 1800
- The present and ongoing investments engaged for 2G/2.5G networks are necessary to continue to develop the mobile market
- The 2500-2690 MHz band is the only extension band not used by 2G systems in great part of the world and thus allowing additional capacity and preventing saturation of the core band in high density populated areas
- Refarming of this band in Europe is envisaged for 2008 since it is currently being used for a wide range of services
- An ITU decision on the frequency arrangements in this band is expected in 2004 in order to ensure global harmonisation and equipment availability for 2008

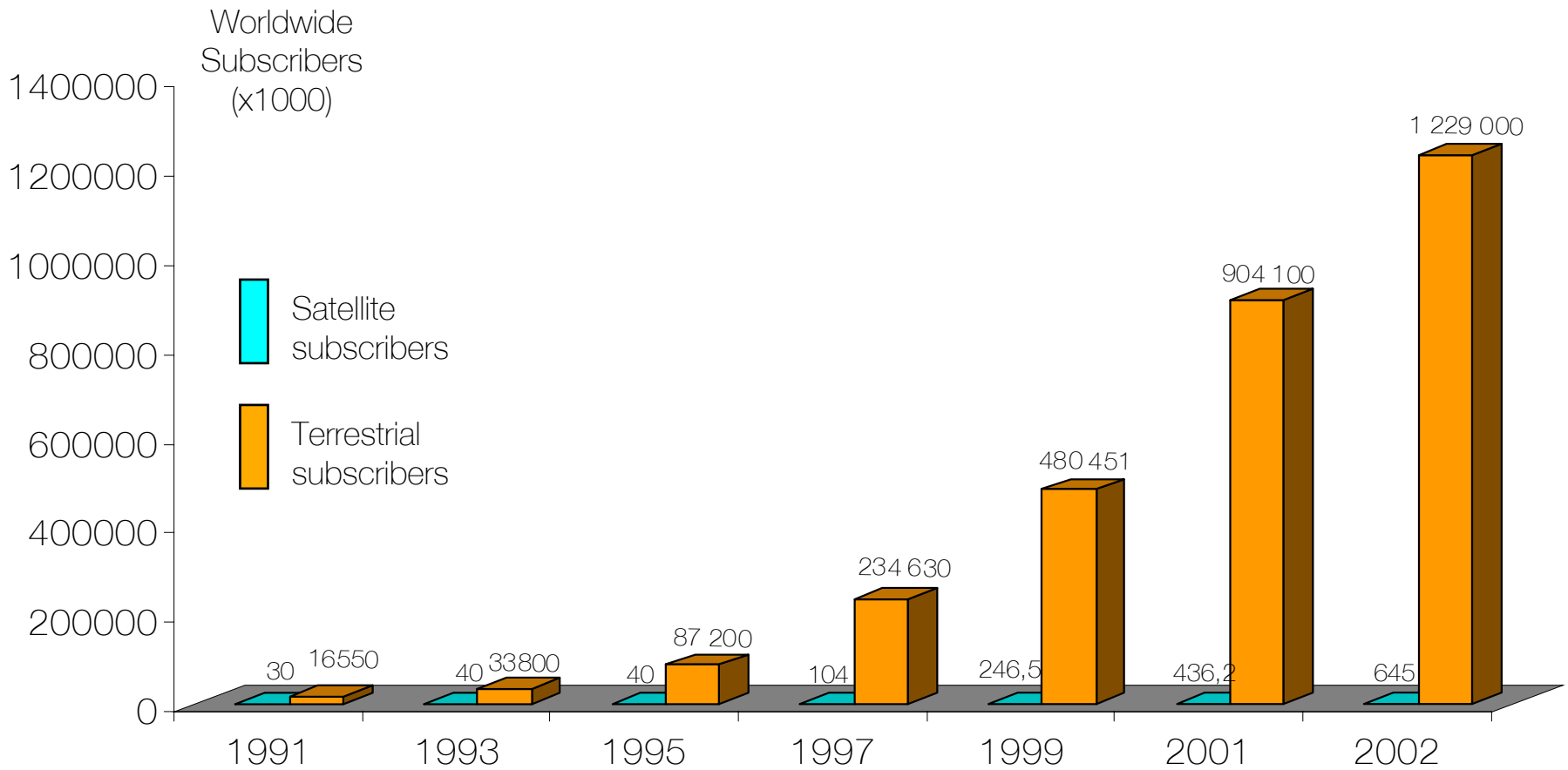
Protection from BSS and BSS (sound) interference in the band 2520-2670 MHz

- Broadcasting Satellite Systems and Broadcasting Satellite (sound) systems are also allocated in the band 2520 – 2670 MHz
- BSS and BSS (sound) interference adversely reduces IMT-2000 coverage and capacity
- WRC-03 adopted technical and regulatory provisions allowing the protection of IMT-2000 from BSS (sound) interference
- WRC-07 agenda item 1.9 will review the technical and regulatory provisions applicable to all satellite systems in the 2500 – 2690 MHz band in order to protect IMT-2000
- Within ITU, JTG 6-8-9 will be in charge of agenda item 1.9
- Previous studies showed that there is clearly a need to reduce the power flux density limits applicable to BSS systems in the band 2520 – 2670 MHz in order to protect IMT-2000

The entire 2500-2690 MHz band is needed for terrestrial IMT-2000

- The bands 2500-2520 MHz and 2670-2690 MHz are allocated to satellite and terrestrial IMT-2000 subject to market demand (Resolution 225)
- The important increase in the number of subscribers and in traffic volumes of 2G terrestrial mobile services is expected to continue on 3G
- Satellite IMT-2000 services could complement the coverage of terrestrial IMT-2000 in remote areas extending the coverage of terrestrial IMT-2000 and will have enough spectrum in the bands already identified for satellite IMT-2000 below 2.5 GHz particularly in the core band
- The entire 2500-2690 MHz band will be needed for terrestrial UMTS/IMT-2000 to offer the long term necessary capacity in high density populated areas

Mobile et Mobile Satellite markets evolution



IV – Studies on the extension of mobile coverage

IMT-2000 spectrum - particular requirement for low populated areas

- IMT-2000 offering basic communication services to a majority of users should be made accessible
  - in most areas including sparsely populated and low traffic density areas
  - within an appropriate timeframe
  - under reasonable economic conditions

- Specificity of IMT-2000 deployment in low populated areas requires identification of spectrum in an appropriate frequency range on a world-wide basis
  - providing economies of scale
  - allowing cost-effective deployment
  - facilitating global roaming

- The frequency range below 1 GHz is best suited to provide economical coverage of rural and low populated areas through the use of large cells however IMT-2000 bands below 1 GHz already identified by WRC-2000 are extensively used by 2G networks in great part of the world

WRC-07 agenda item 1.4

- 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"
- Need for a harmonised frequency band below those already identified for IMT-2000 allowing operators to achieve an appropriate coverage of the territory in fair competitive conditions and in realistic economic circumstances for developing countries
- The 2005 Regional Radiocommunication Conference (RRC) will plan the digital terrestrial broadcasting service in parts of Region 1 and 3 in the frequency bands 174-230 MHz and 470-862 MHz
- IMT-2000 access to adequate spectrum within the band 470-862 MHz should be taken into account by RRC
- WRC-07 is expected to consider the results of ITU-R studies concerning the identification of a harmonised frequency band for IMT-2000 below those already identified for IMT-2000

V - Conclusion

UMTS/IMT-2000 spectrum issues

- The mobile market is growing rapidly with about 1.2 billion users worldwide
- Mobile worldwide harmonisation has been achieved around GSM used by more than 70% of users in the world
- Natural evolution of GSM networks will lead towards UMTS
- UMTS/IMT-2000 will be initially implemented within WARC-92 bands
- The band 2500 – 2690 MHz will offer in the longer term the required capacity for UMTS/IMT-2000 networks in high density populated areas
- Studies towards identification at ITU level of a harmonised frequency band below those already identified for IMT-2000 allowing operators to achieve an appropriate coverage of the territory in fair competitive conditions and in realistic economic circumstances for developing countries.

Thank you