
Meeting Spectrum Demands
for Mobile Broadband
Now and in the Future
Monday 19th September
GSMA



Meeting Spectrum Demands for Mobile Broadband
Nigeria Workshop Introduction

Who We Work With In Nigeria









© GSMA 2011

Connecting the World

Fixed



1.1 Billion Lines

Mobile



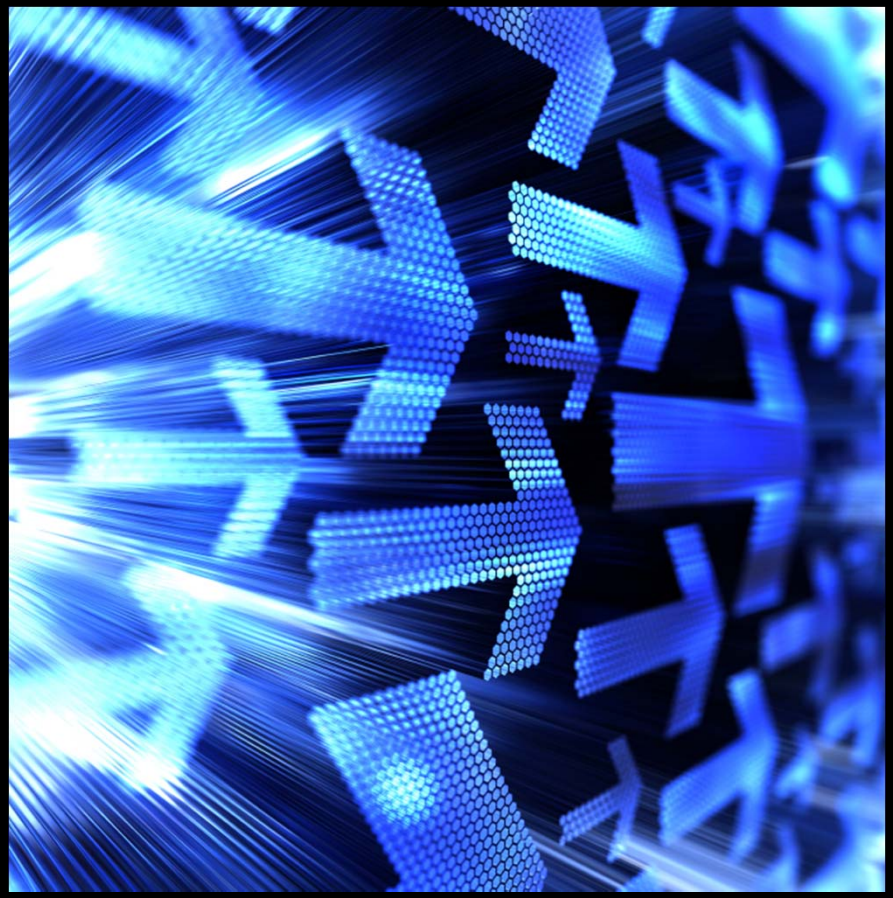
Over 5 Billion Connections

MOBILE BROADBAND WILL CONNECT THE WORLD TO THE INTERNET

© GSMA 2011

Connecting Nigeria

- Analysys Mason Report:
- 6% of all Nigerians currently have access to broadband services
- 74% of those do so through Mobile Broadband
- Mobile broadband is uniquely positioned to stimulate growth and welfare in areas that lack fixed-line broadband infrastructures



© GSMA 2011

Social & Economic Benefits

- Internet connectivity for businesses and consumers to bridge the existing digital divide

- Facilitate the diversification of the economy and provision of new services, particularly in rural areas:
  - Education
  - M-Health
  - Mobile Banking
  - Agriculture
  - E-Government
  - M-Commerce



Source: Analysys Mason

© GSMA 2011



Restricted - Confidential Information
© GSMA 2011
All GSMA meetings are conducted in full compliance with the GSMA's anti-trust compliance policy



The Roadmap for Mobile Broadband in Nigeria

Dr. Bashir Gwandu
Executive Commissioner, The NCC

THE ROADMAP FOR MOBILE FOR BROADBAND IN NIGERIA

GSMA WORKSHOP ON MEETING SPECTRUM DEMAND FOR MOBILE BROADBAND, NOW AND IN THE FUTURE

Eko Hotel, Lagos, Nigeria, 19th Sept 2011

Bashir Gwandu, PhD, MBA, CEng FIET
Executive Commissioner *(Technical Services)*
Nigerian Communications Commission (NCC)
Bashirgwandu@yahoo.co.uk

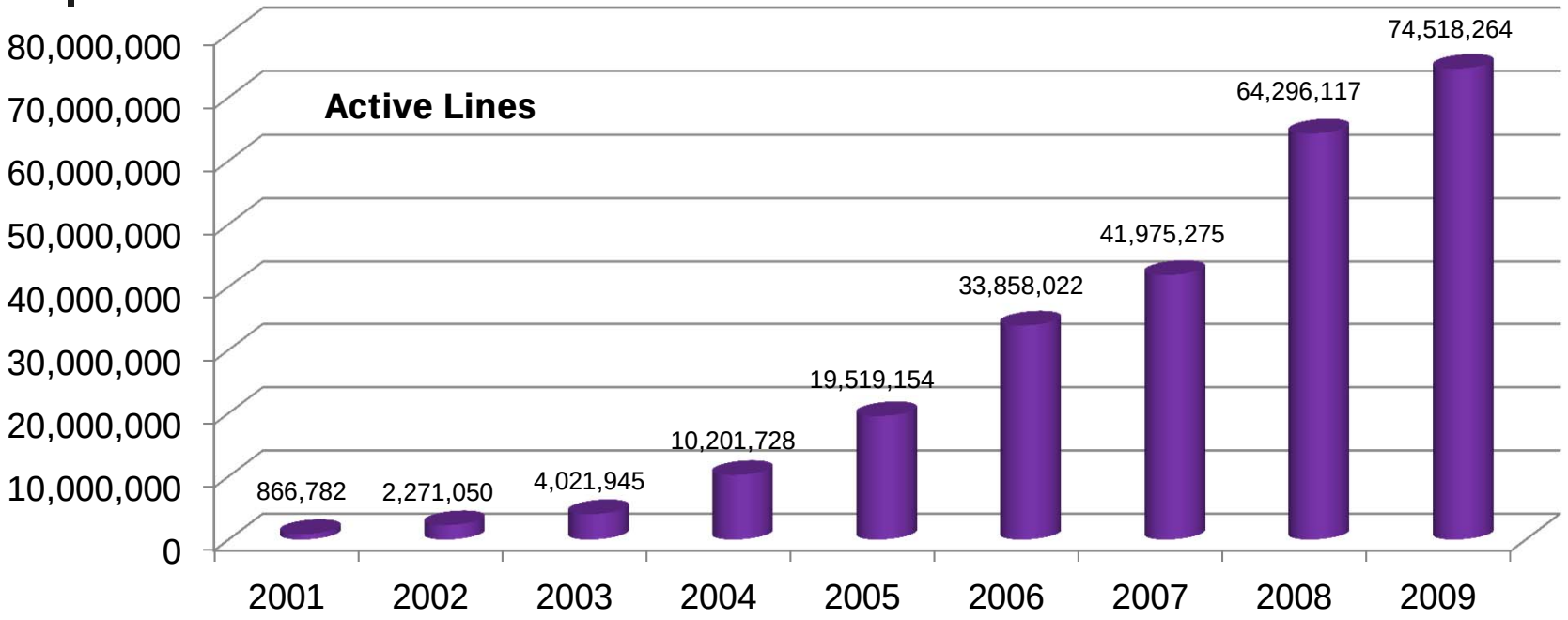
Outline

- Progress in Subscriber uptake and Demand Consideration
- Access Routes for BB Communication End-to-End
  (Identification of Bottlenecks on International, National, Local and Last mile)
- Work on Economies of scale (ITU Identification, Allocation, and Harmonization of Spectrum)
- Plan Well, go by the most popular standards, Auction.
- Examine Local Demand (Applications to Hand) and Decide on Award Process

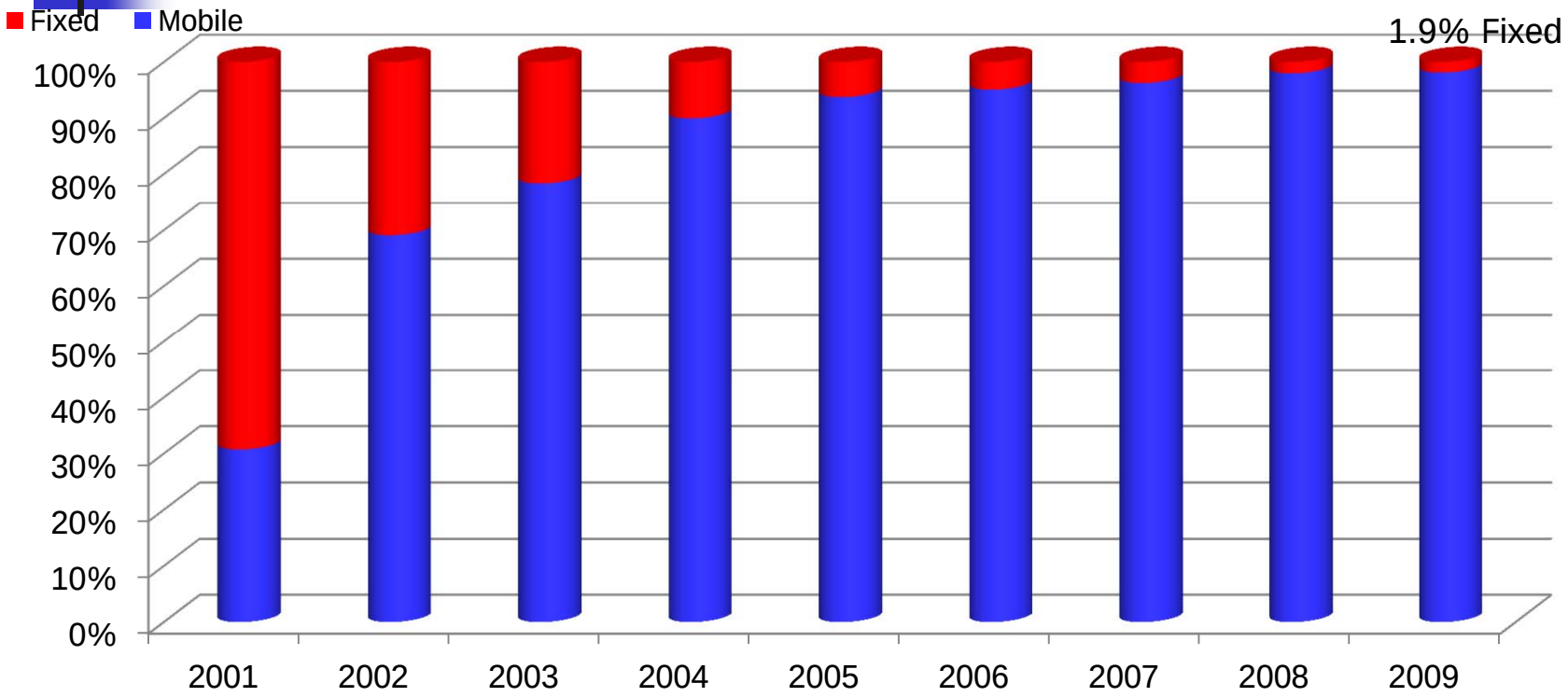
EMPOWERMENT THROUGH ICT

- Separate World-Bank studies have indicated two important results:
  - Every dollar invested in telecommunications translates to $6 of economic benefit to the country or the region where such investments have been made.
  - A 1% increase in internet users increases total exports by 4.3%
  - It has been stated that “Bandwidths is the life-blood of the worlds knowledge economy, but it is scarcest where it is most needed –in the developing nations of Africa which require low-cost communications to accelerate their socio-economic development”.

GROWTH OF SUBSCRIBER LINES NIGERIA



PROPORTION OF FIXED TO MOBILE NIGERIA

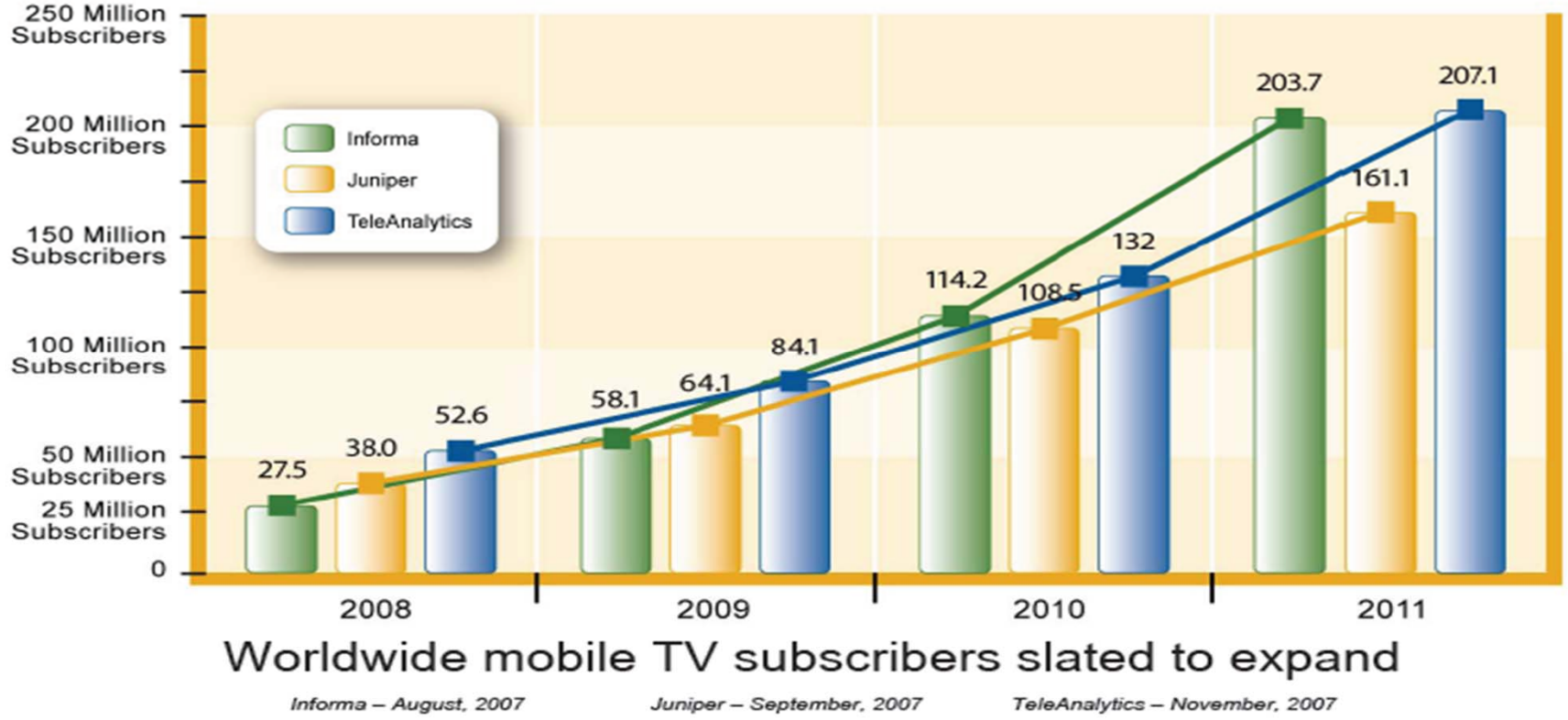


MOBILE DEVICE MARKET IS BOOMING



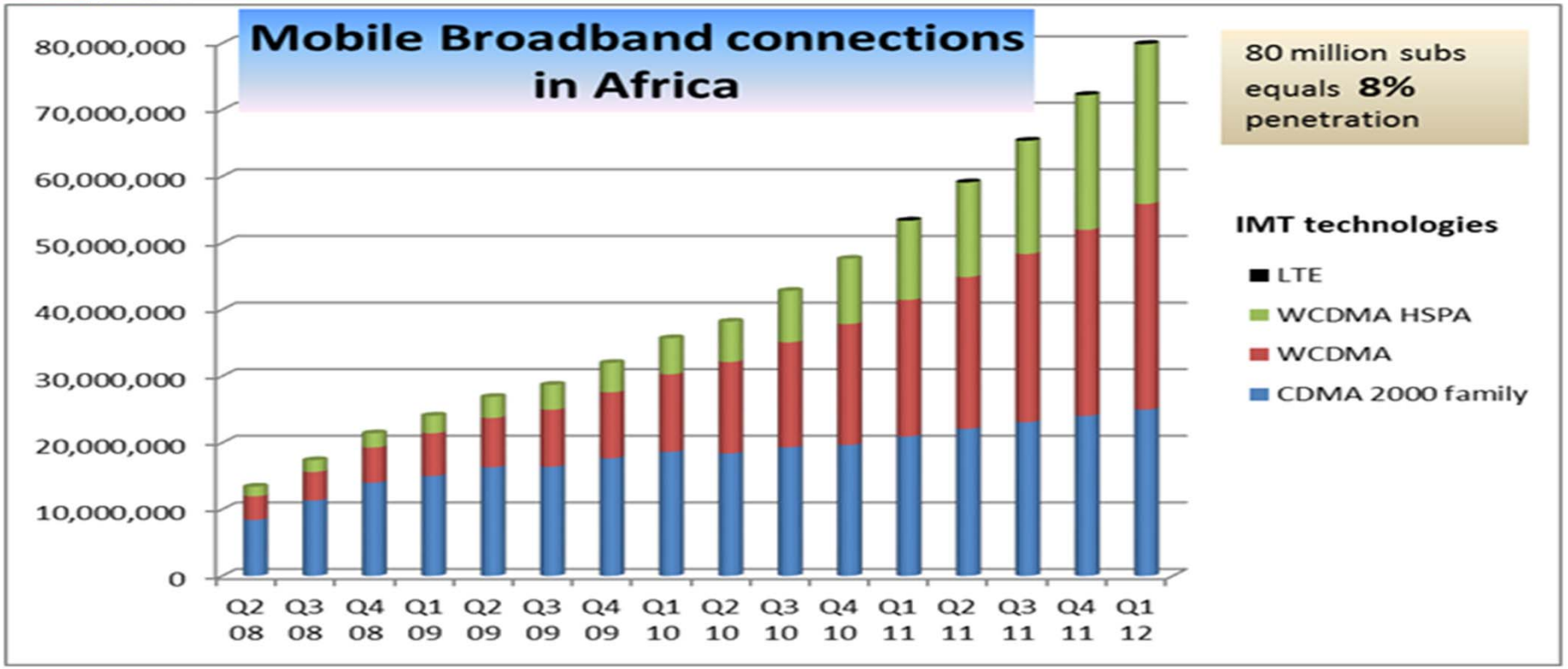
Source: GSA – Global mobile Suppliers Association: September, 2008

FORECASTS SHOW SIGNIFICANT GROWTH FOR MOBILE TV



MOBILE BROADBAND CONNECTION

(Source GSMA)



AFRICA HAS THE LOWEST BROADBAND PENETRATION

Who ranks where in ITU's latest ICT Development Index (IDI)? Top five economies within each region

Regional IDI Rank	Europe	Global IDI Rank	Asia&Pacific	Global IDI Rank	Americas	Global IDI Rank	Arab States	Global IDI Rank	CIS	Global IDI Rank	Africa	Global IDI Rank
1	Sweden	1	Korea (Rep.)	2	United States	17	UAE	32	Russia	50	Seychelles	57
2	Denmark	3	Hong Kong, China	11	Canada	19	Bahrain	42	Ukraine	51	Mauritius	62
3	Netherlands	4	Japan	12	Argentina	47	Qatar	44	Belarus	54	South Africa	87
4	Iceland	5	Australia	14	Chile	48	Saudi Arabia	55	Moldova	68	Cape Verde	105
5	Norway	6	Singapore	15	Uruguay	49	Kuwait	57	Kazakhstan	69	Gabon	107

Region with the highest IDI scores

Region with the lowest IDI scores

Source: The ITU IDI is a composite index based on 11 indicators. The Index, which captures the level of advancement of ICTs in more than 150 countries worldwide and compares progress made between 2002 and 2007, was published in the 2009 Measuring the Information Society Report.

AFRICA TRAILING WELL BEHIND ON MOBILE BROADBAND PENETRATION

Mobile broadband growth, 2000-2008

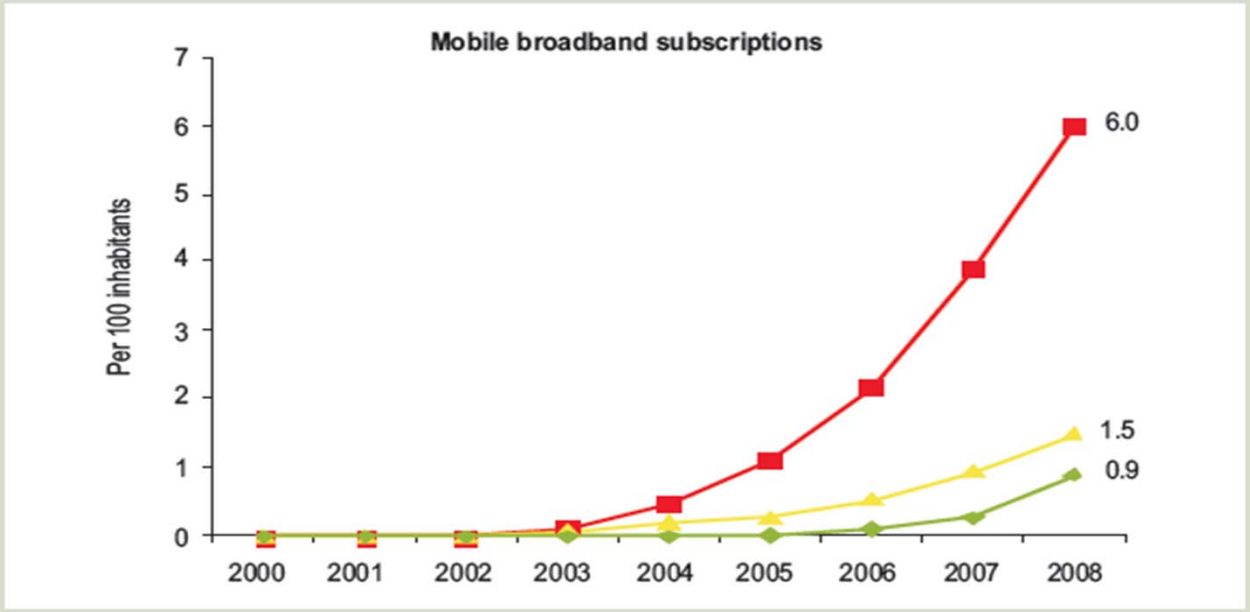
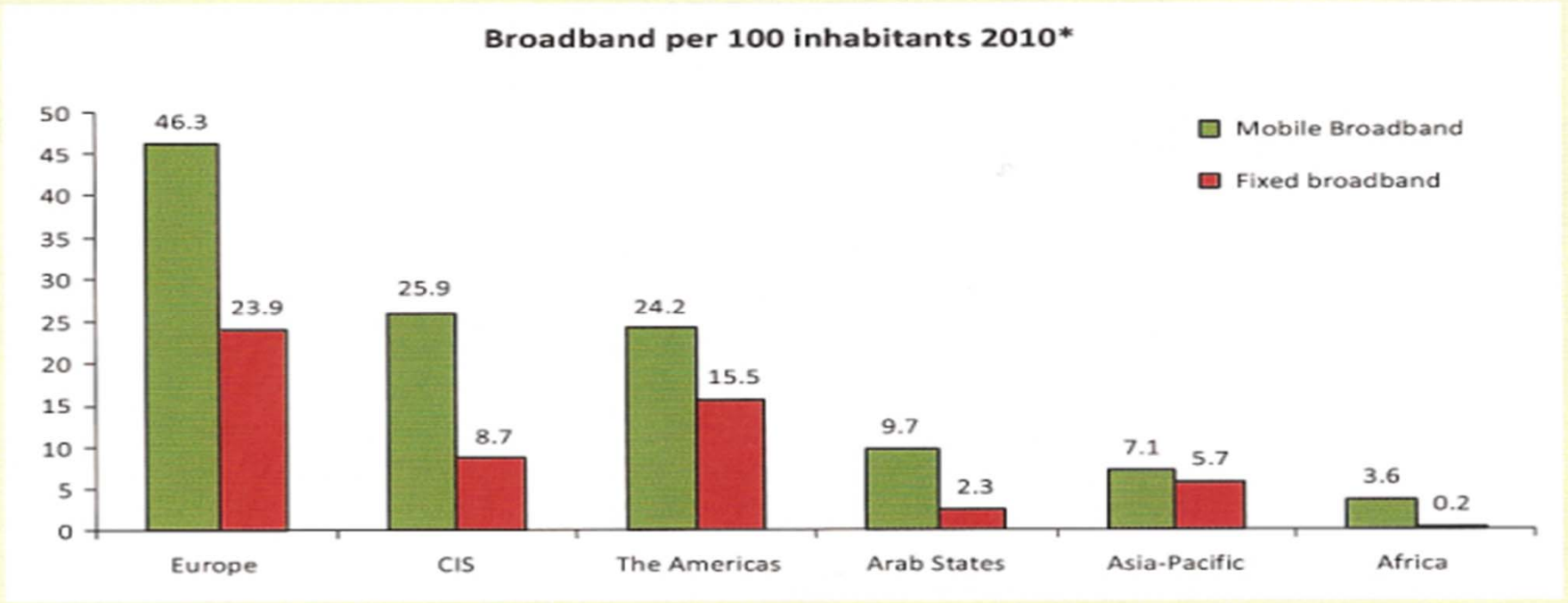


Chart 1.13

World
Developing countries
Africa

Source: ITU World Telecommunication/ICT Indicators database.

FORGET THE HYPE: -WE HAVE GOT A LOT TO DO ON BROADBAND PENETRATION IN AFRICA (SOURCE-ITU)



*Note: * estimates.*

PROJECTIONS OF GROWTH IN SUBCRIPTIONS: FIXED TO MOBILE BB

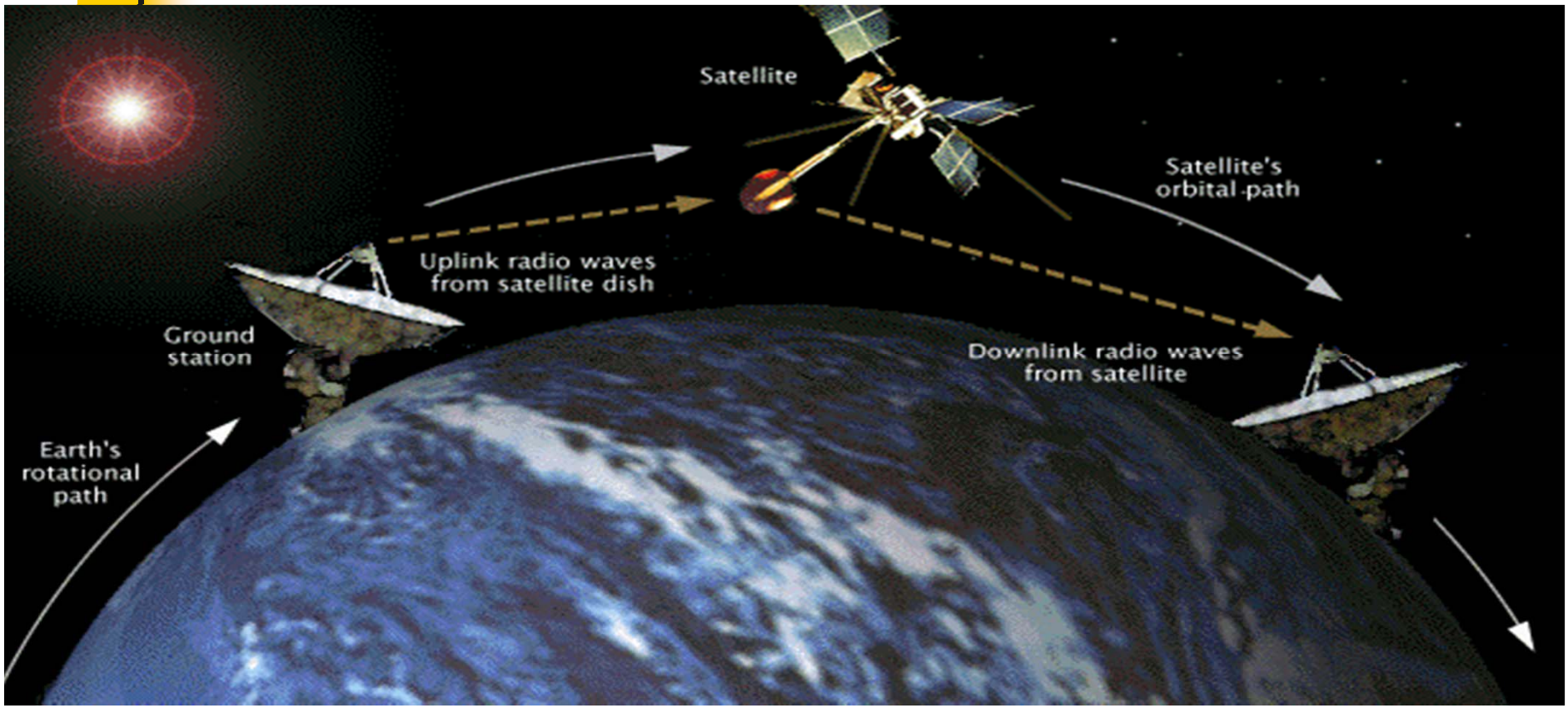


Source: Analysys Mason, 2008

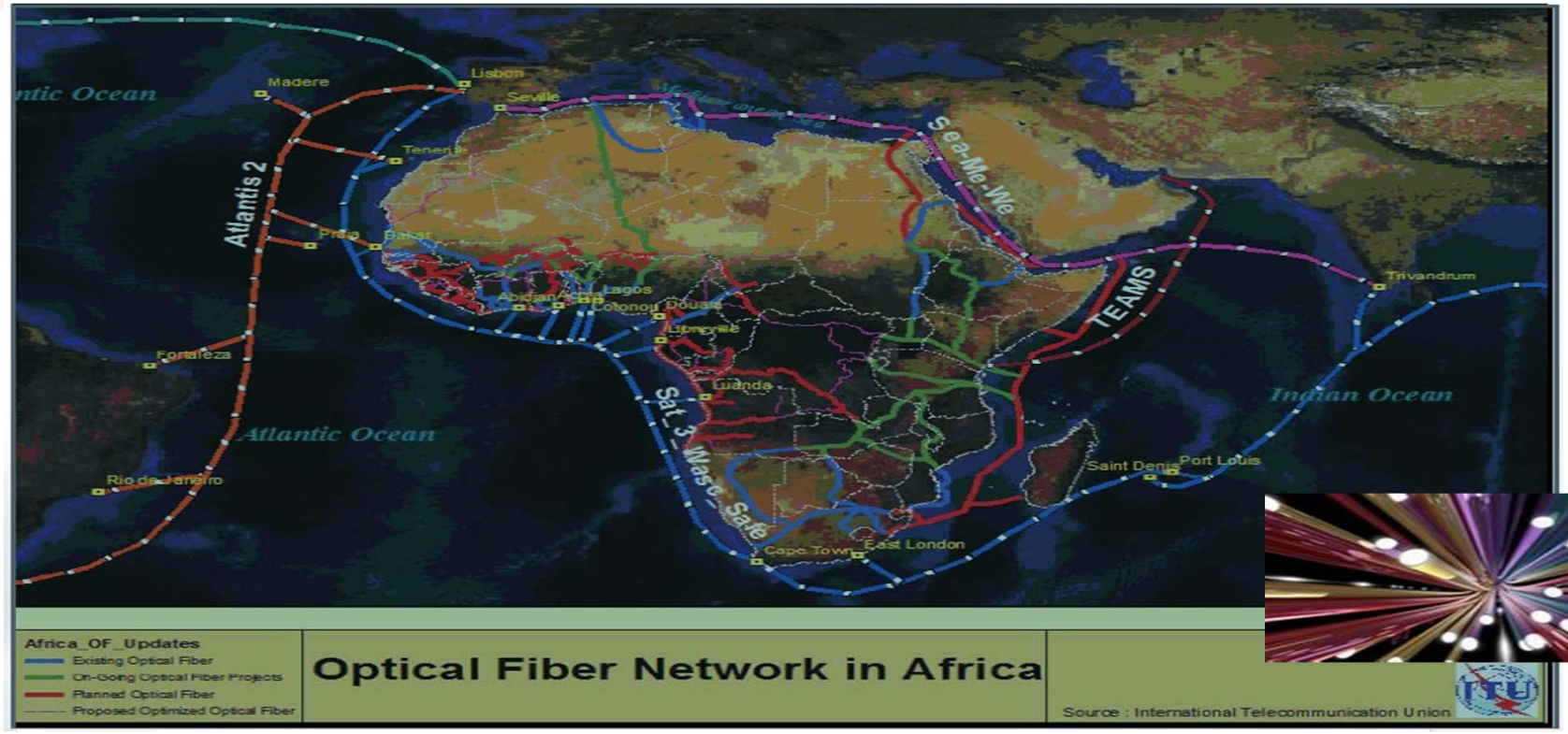
S7

EXAMINE THE INTERNATIONAL TRANSMISSION SYSTEMS AVAILABLE

SATELLITE RELAY SYSTEM



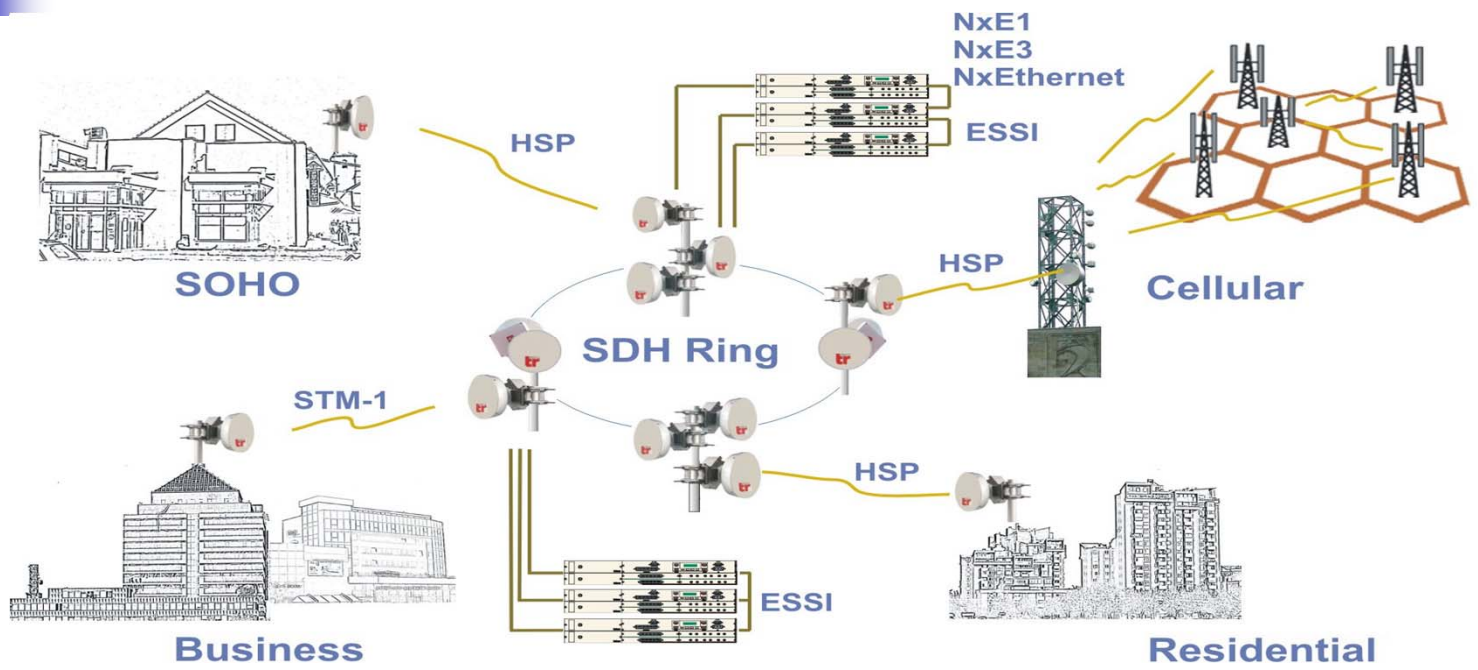
Fibre support Mobile and Broadband Revolution



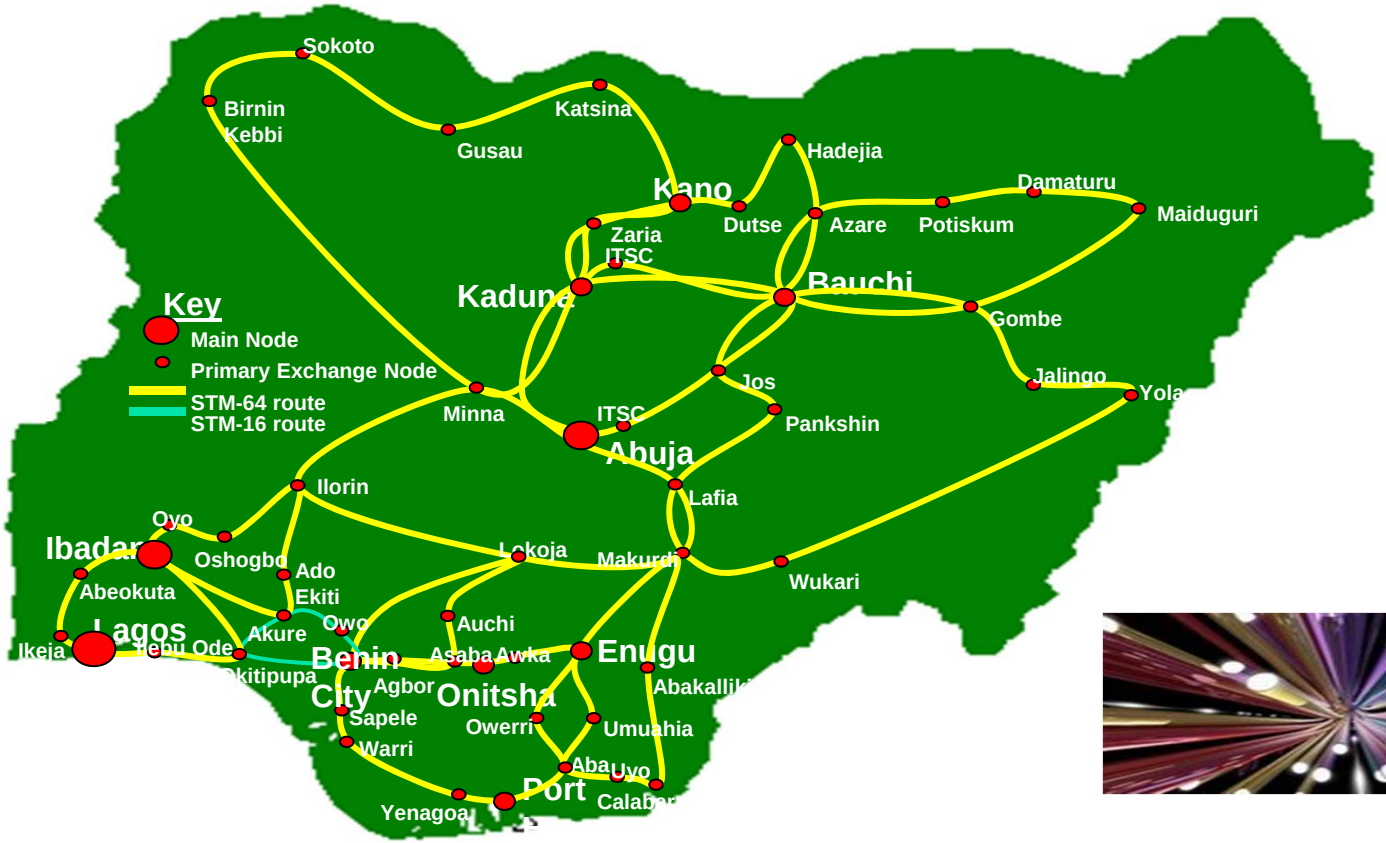
S8

THE NATIONAL TRANSMISSION SYSTEM AVAILABLE

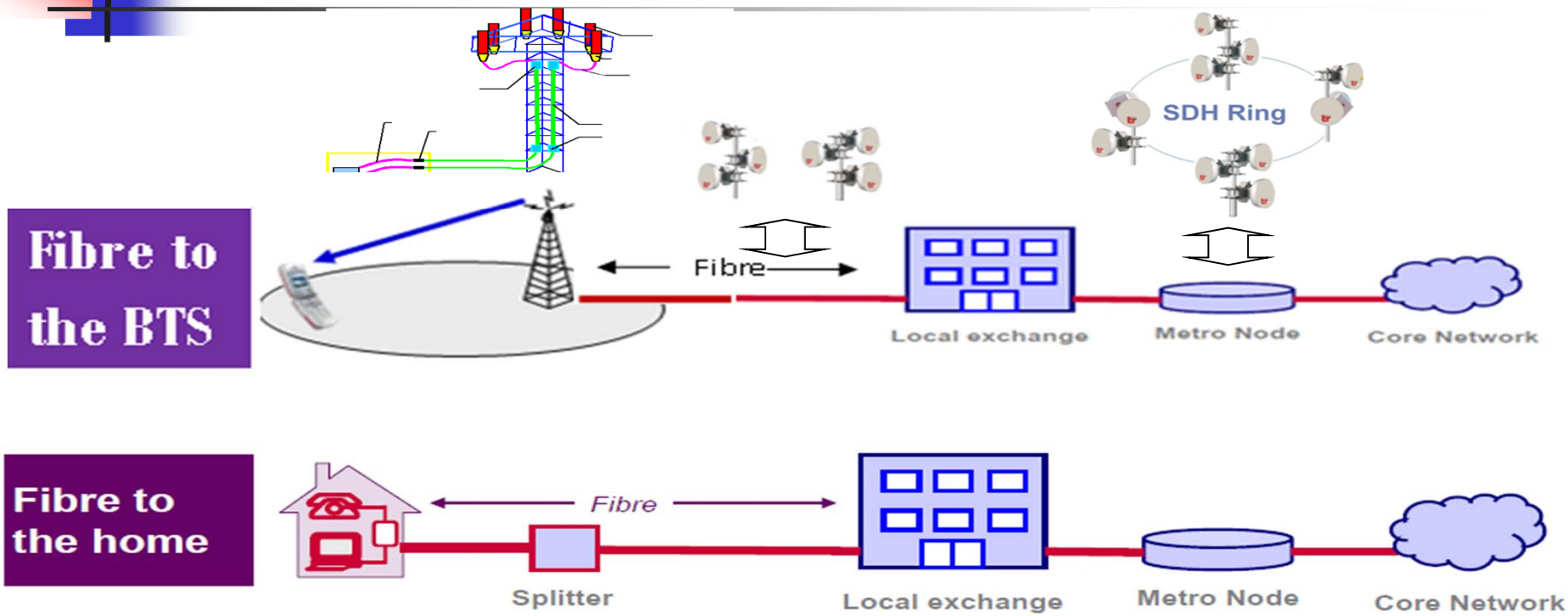
TECHNOLOGIES FOR SHORT-HAUL MICROWAVE-TERRESTRIAL



CONFIGURATION NATIONAL TRANSMISSION FIBRE NETWORK: NEW



Fibre to BTS and to Home/Office

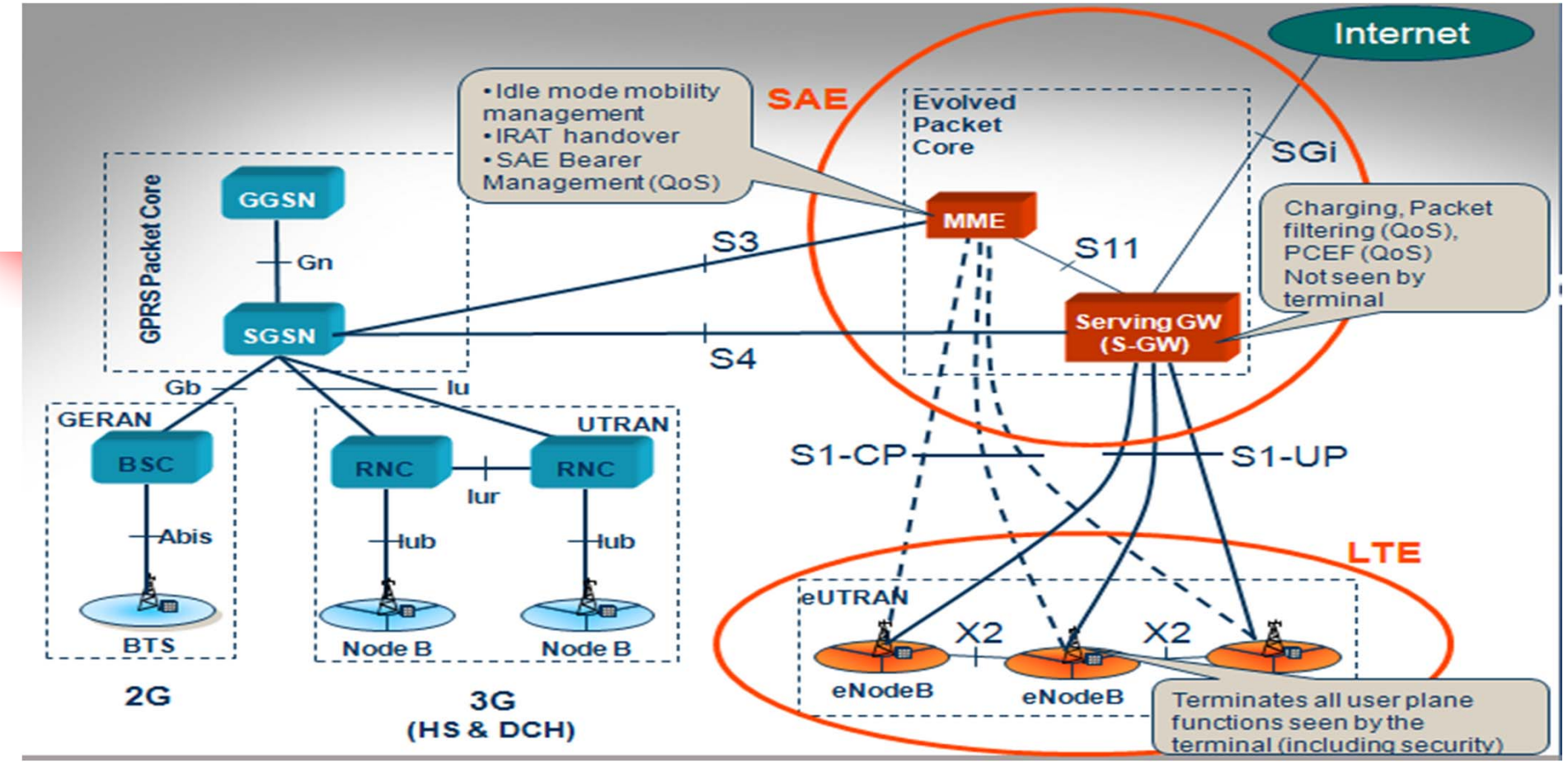


NIGERIAN COMMUNICATIONS COMMISSION

S9

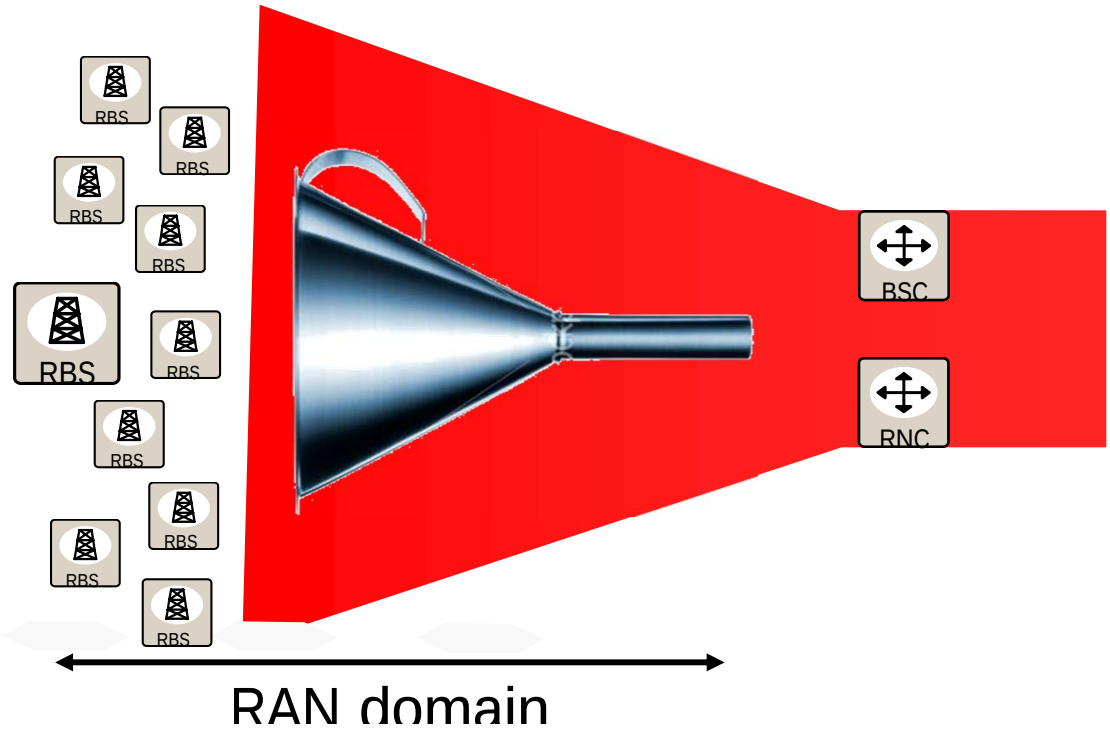
THE DISTRIBUTION SYSTEM AVAILABLE

Interfaces for Different Technologies



Challenge 1: Clearing the bottlenecks

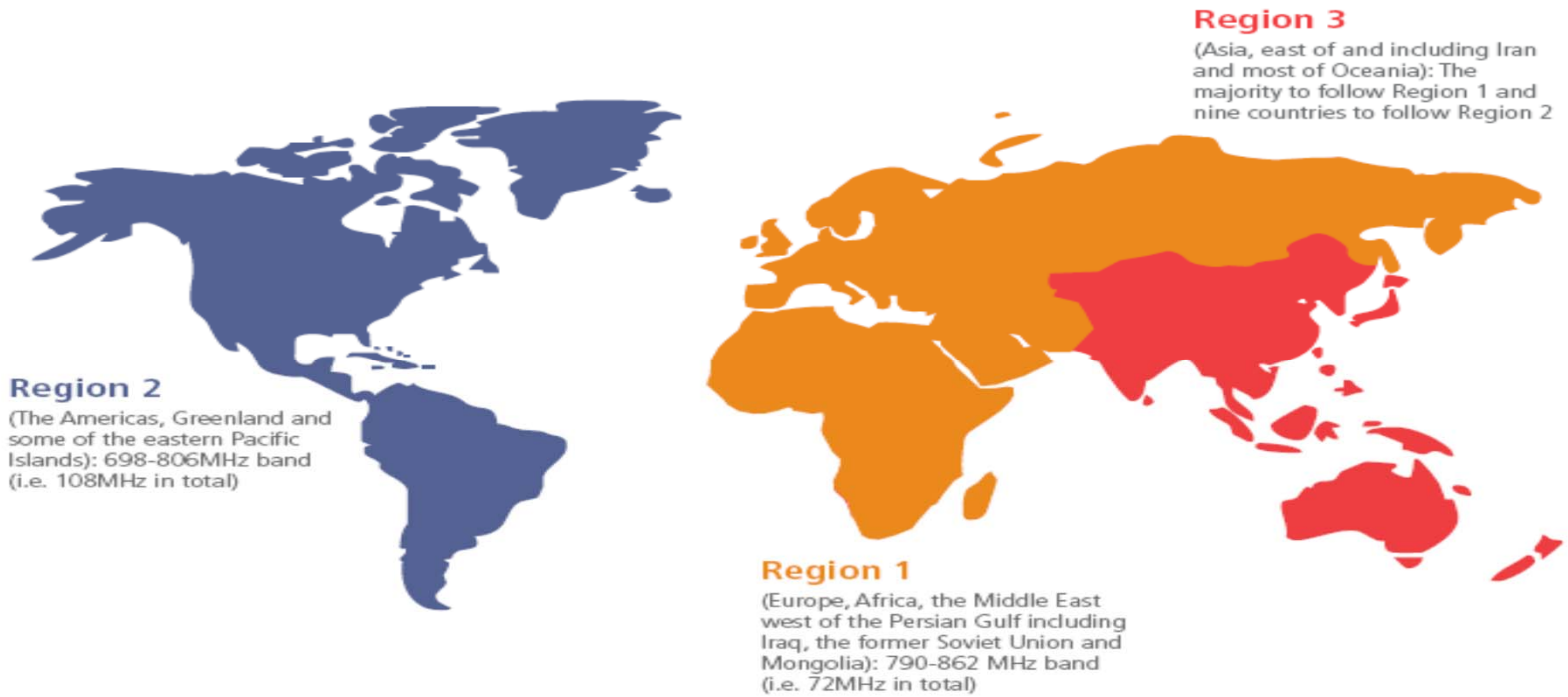




S10

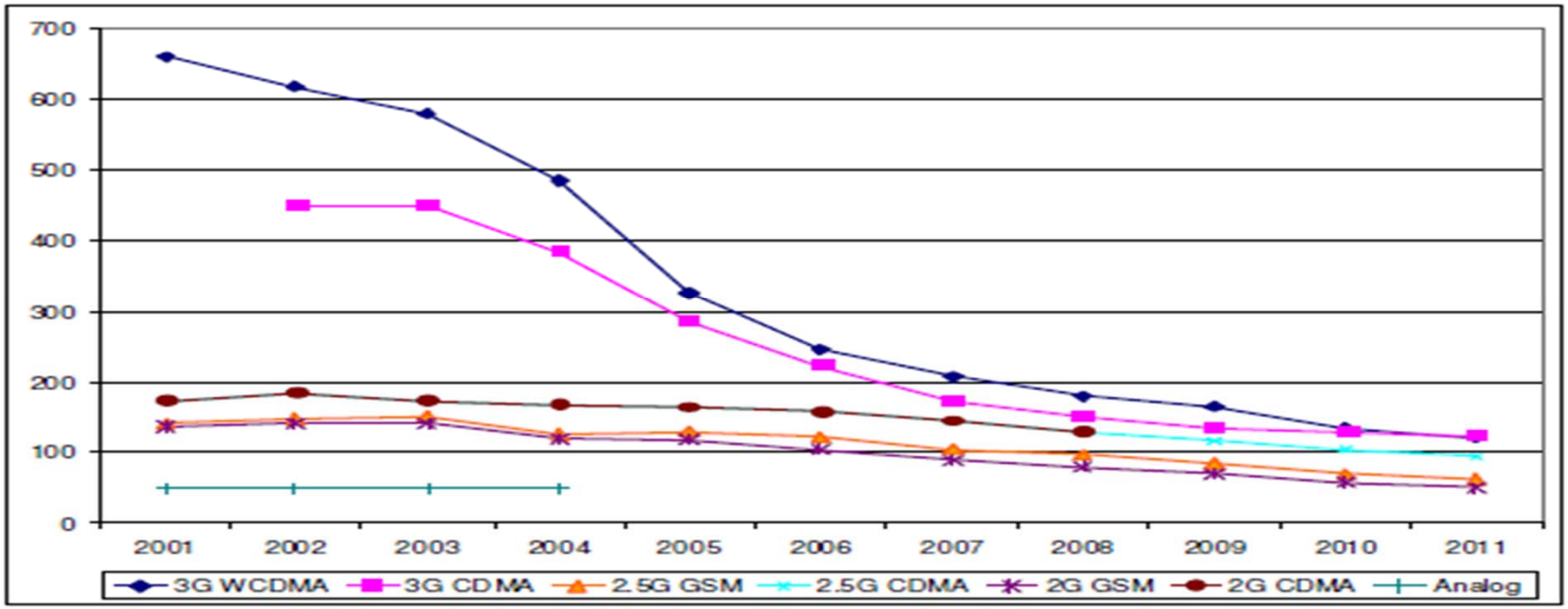
SPECTRUM HARMONISATION (LAST MILE WIRELESS)

ITU- REGIONS ARRANGEMENT



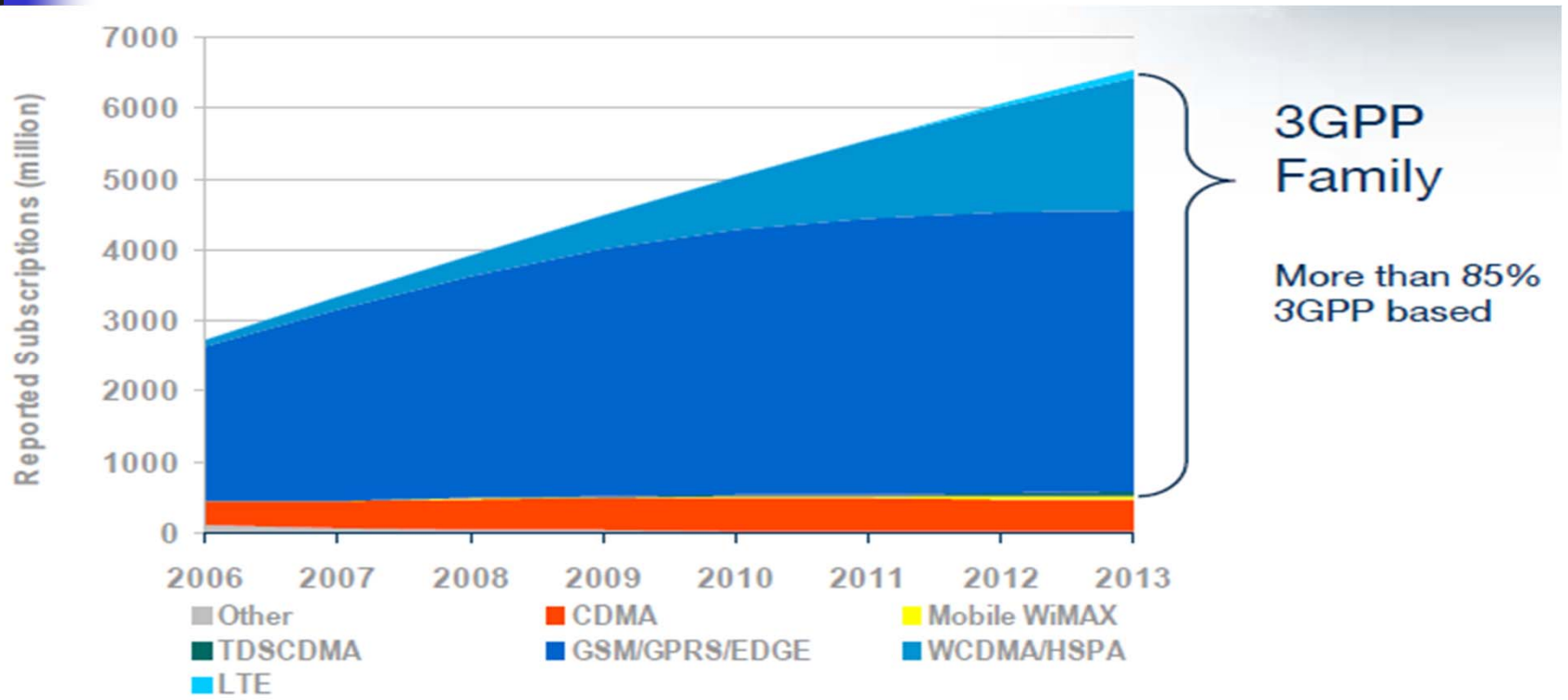
HARMONISATION ENFORCED HANDSET PRICE TREND

Figure 4: Average selling price for handsets (ASP)

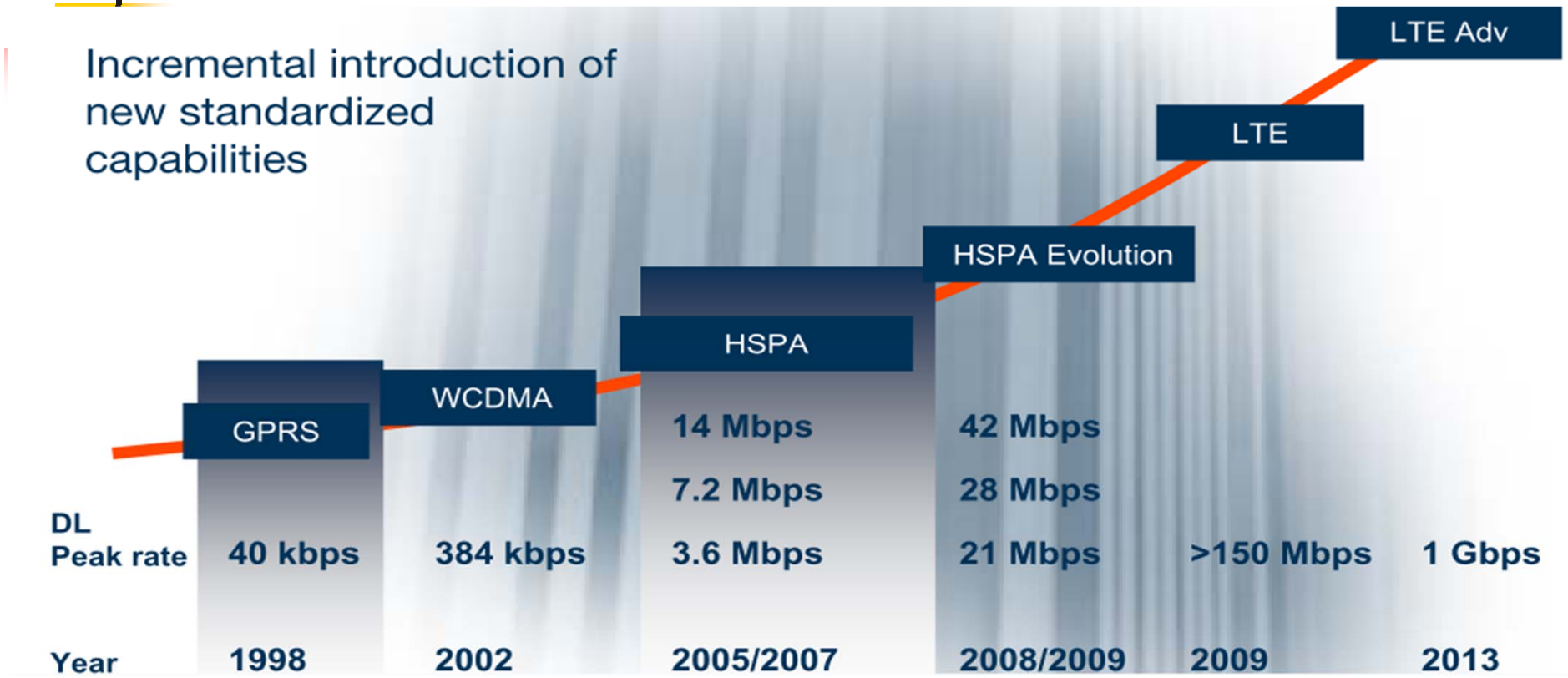


Source: LECG analysis of data from Strategy Analytics and Yankee Group.

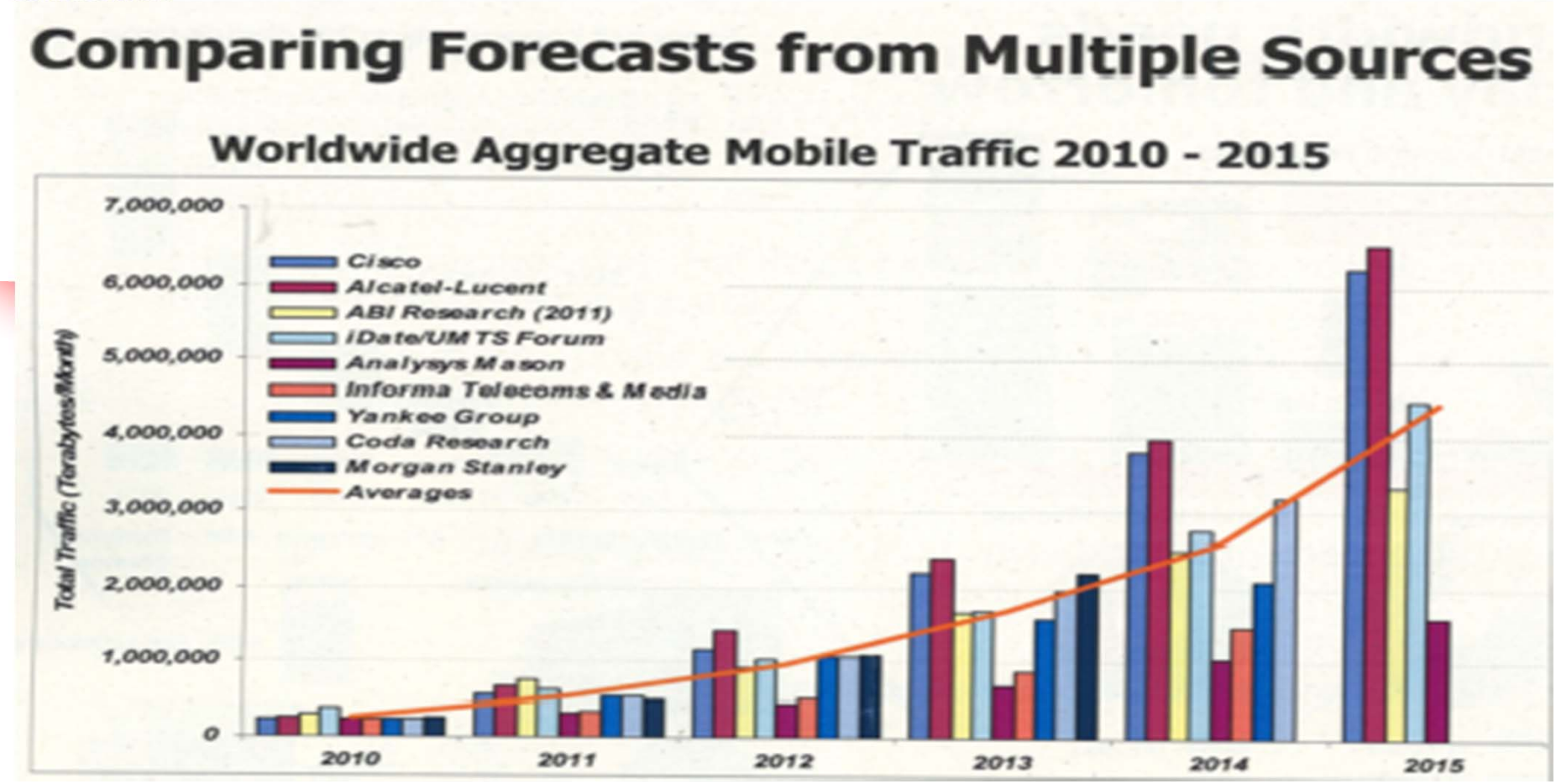
CONSIDERATION TO STANDARD THAT SUPPORT ECONOMIES OF SCALE (2.3GHz AND 2.5GHz LTE/WIMAX)



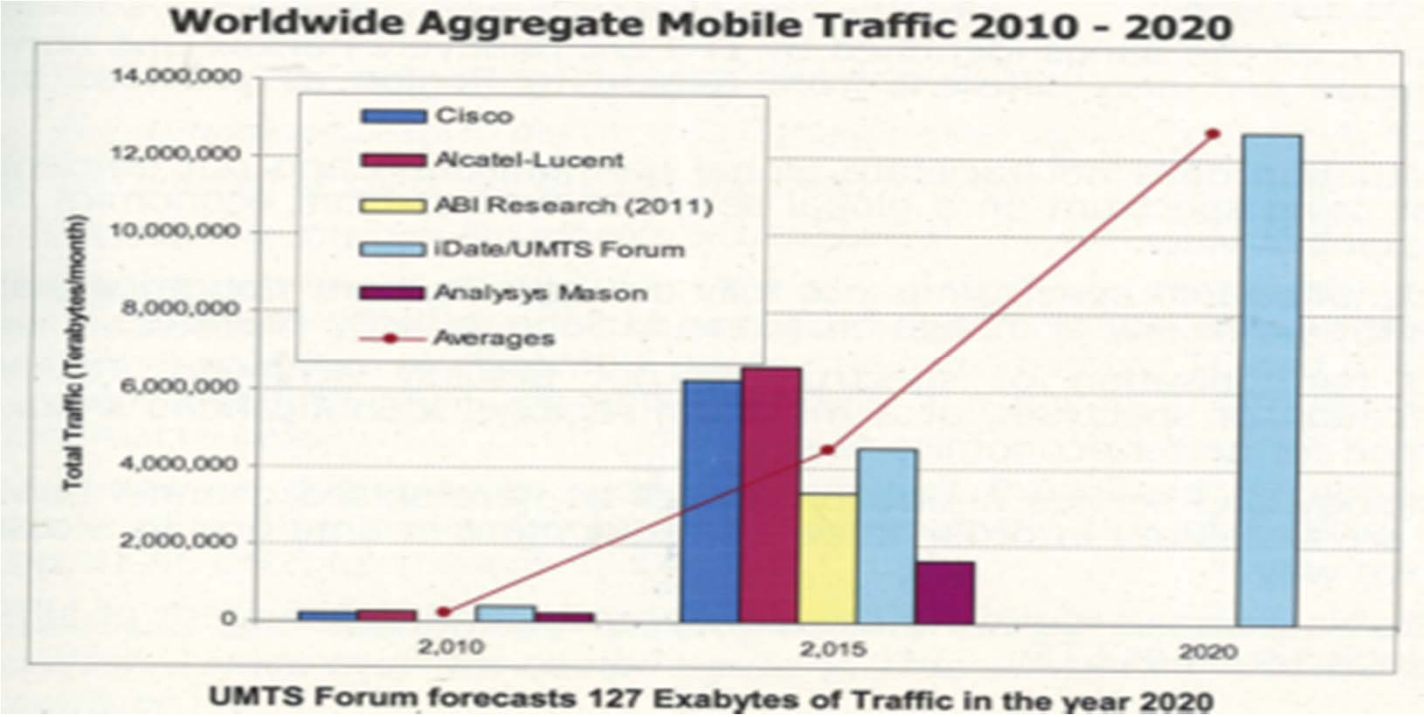
3GPP Family Evolution (1000x in 10yrs)



PROJECTIONS OF GROWTH IN TRAFFIC -1

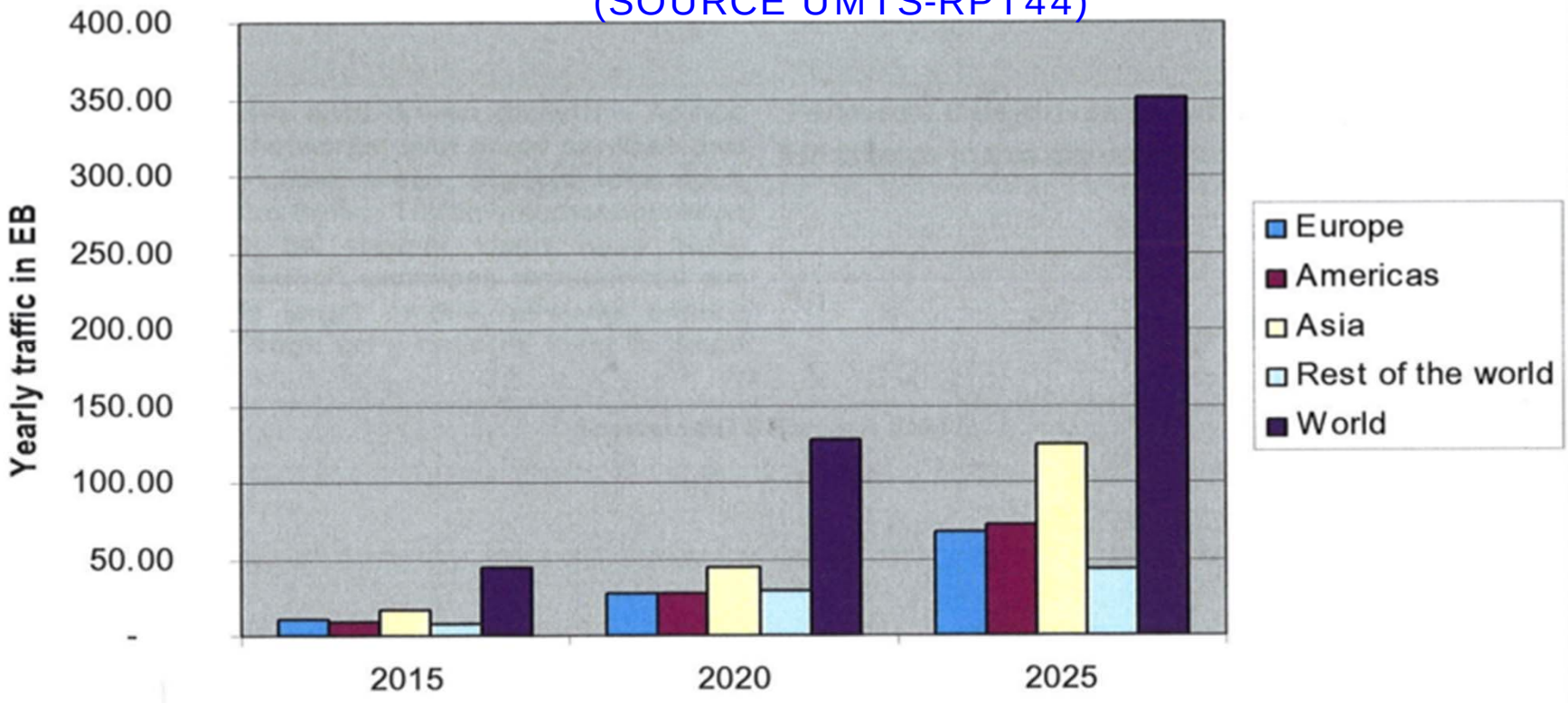


PROJECTIONS OF GROWTH IN TRAFFIC -2 FIVE MORE YRS



PROJECTIONS OF GROWTH IN TRAFFIC-3, GOING FORWARD

(SOURCE UMTS-RPT44)



ADVANTAGES OF SUB-1000MHz FREQ

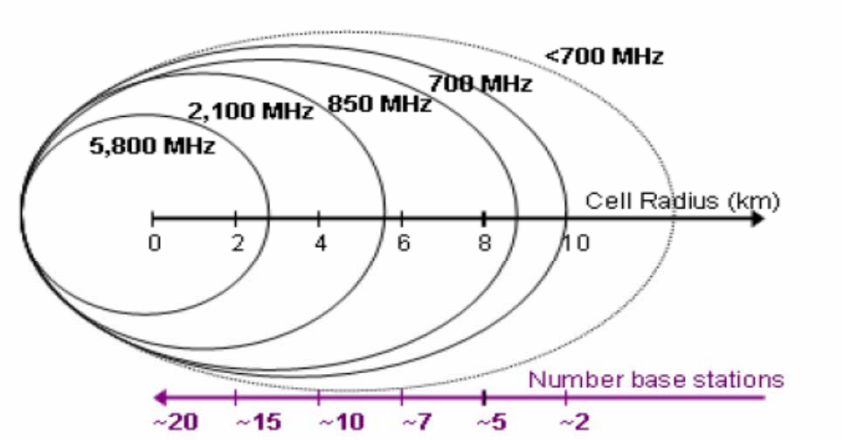
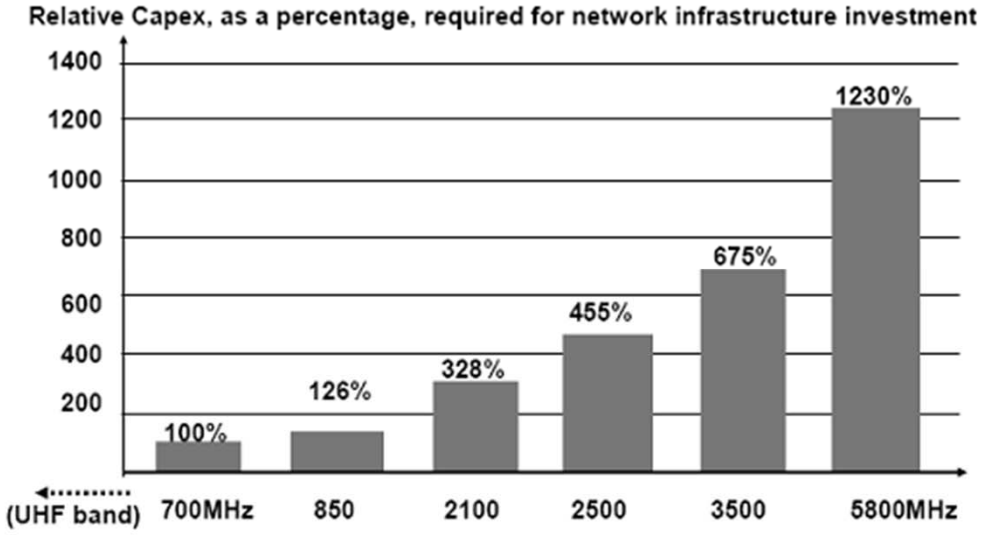
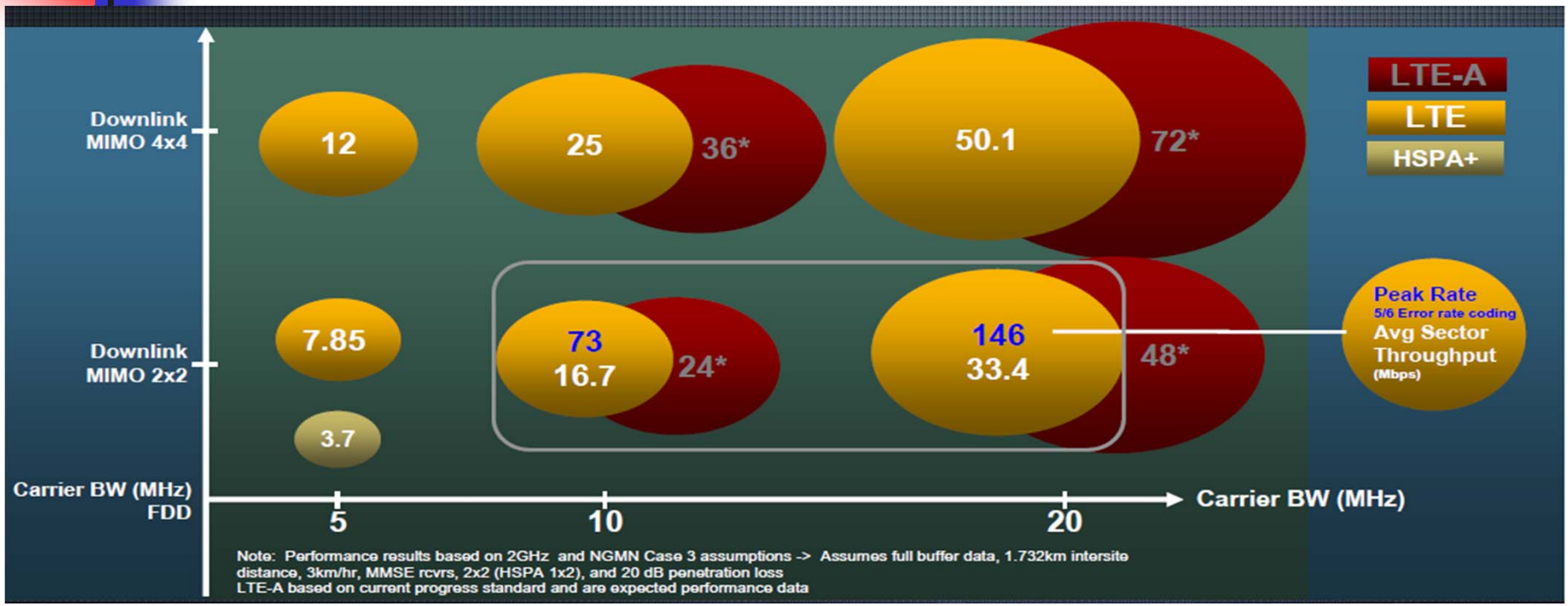


Figure 2.The propagation characteristics of spectrum

Source: BBC R&D.



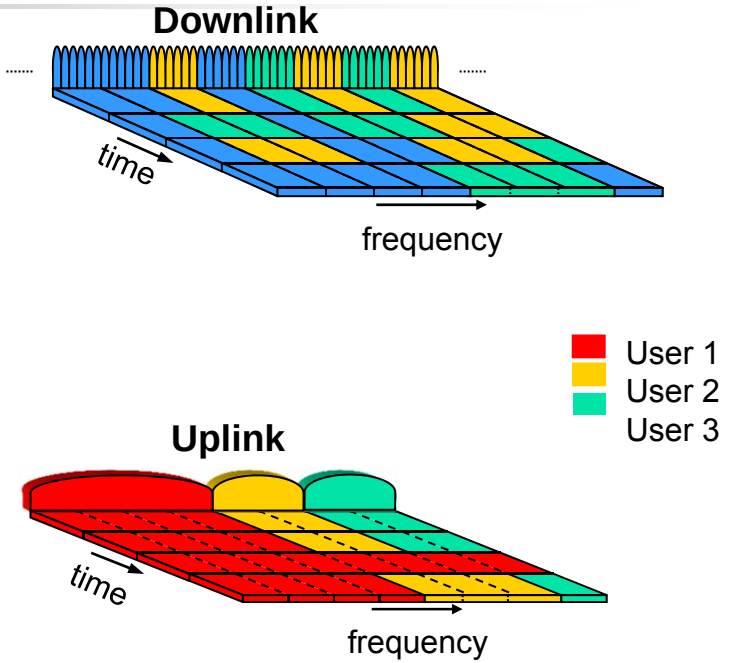
CONSIDERATION FOR SPEED TO BANDWIDTH SIZE when planning



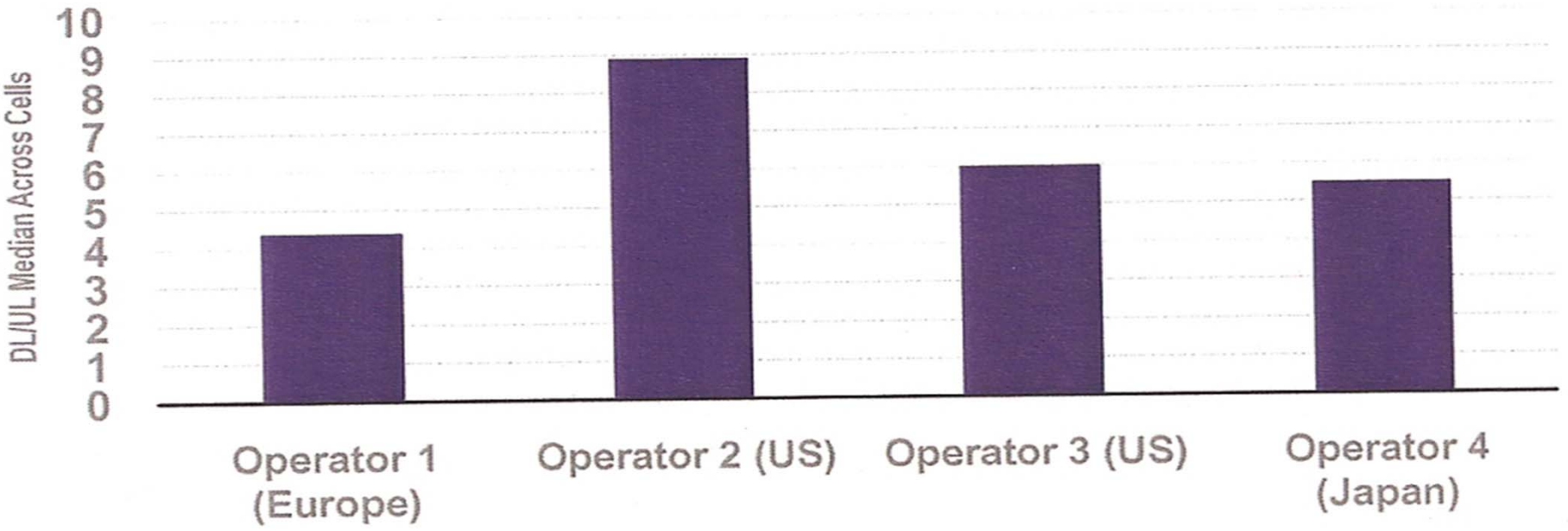
Source: NAT, Rysavy Research, CDG-QCOM

UPLINK TO DOWN LINK

- Downlink: Multi-layered OFDM
  - Channel-dependent scheduling and link adaptation in time and frequency domain
- Uplink: Single Carrier-FDMA
  - Higher uplink system throughput
  - Improved coverage and cell-edge performance
  - Lower terminal cost and improved battery life

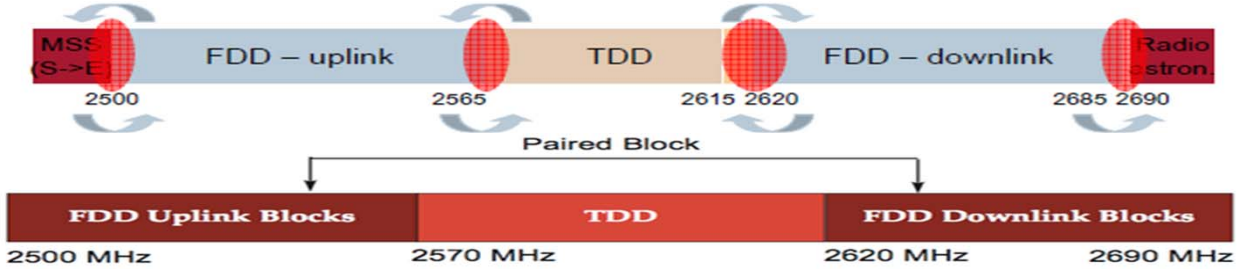


CONSIDERATION FOR UL AND DL , AND FOR INTERFERENCES (1.4GHz AND 2.3GHz)



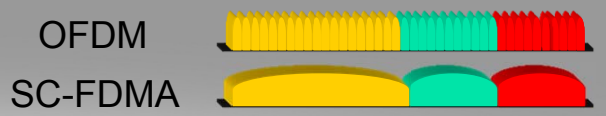
CONSIDERATION FOR UL AND DL INTERFERENCES (2.3GHz AND 2.5GHz)

States		2.3GHz							..	2.5GHz (190MHz in Total) i.e 2500-2690MHz											
		1st 30MHz Unpaired		2nd 30MHz Unpaired		3rd 30MHz Unpaired				70MHz 1st Leg Paired					40MHz Un-paired			70MHz 2nd Leg Paired			
Lagos	10	30	3	30	3	DoPC	10	4		20	20	10	20	5		5	20	20	10	20	
FCT						DoPC	10														
PH						DoPc	10														
										A	B	C	D				A	B	C	D	
		TDD		TDD		TDD					F	D	D		T D D			F	D	D	



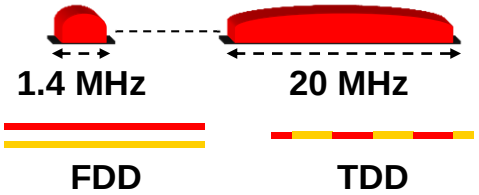
WHY LTE ON 2.3GHz

- OFDM Radio Technology





- Multi-antenna transmission

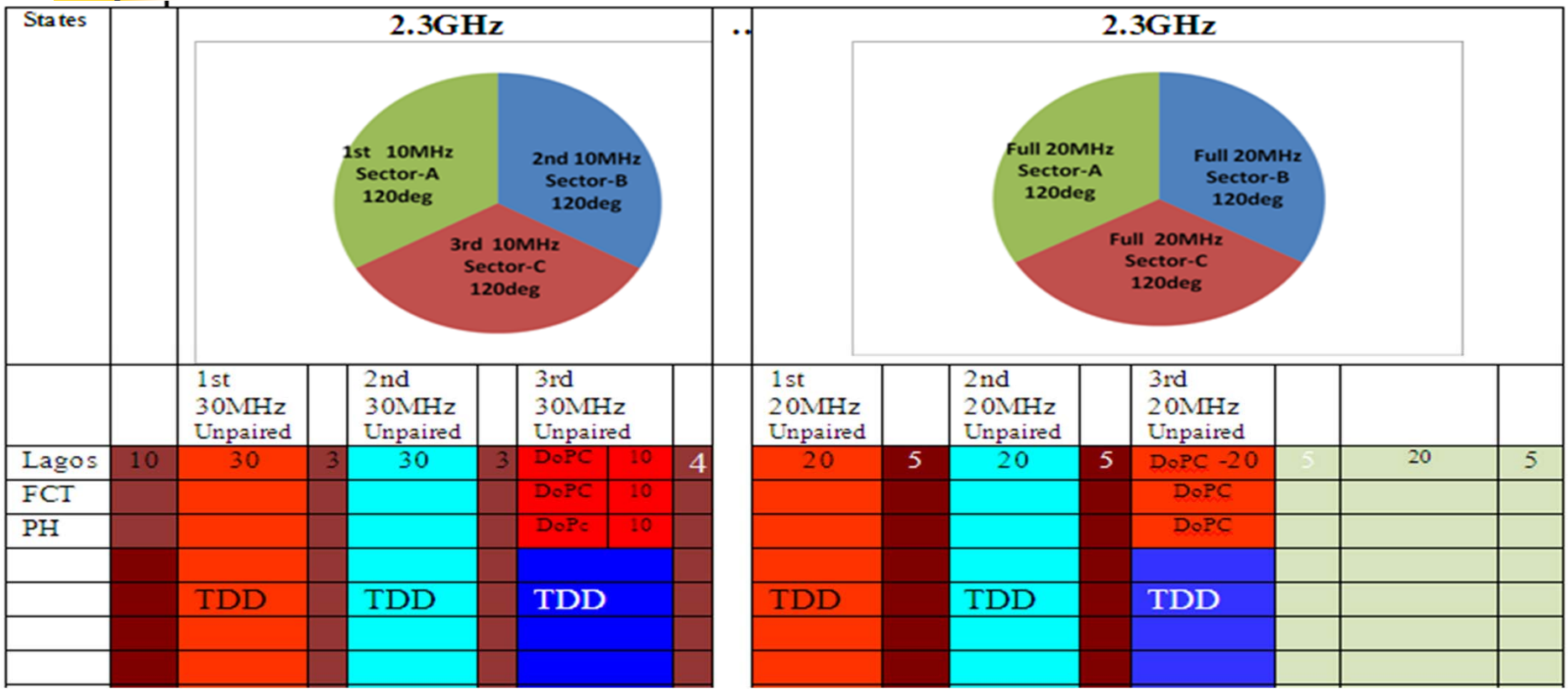


- Spectrum flexibility

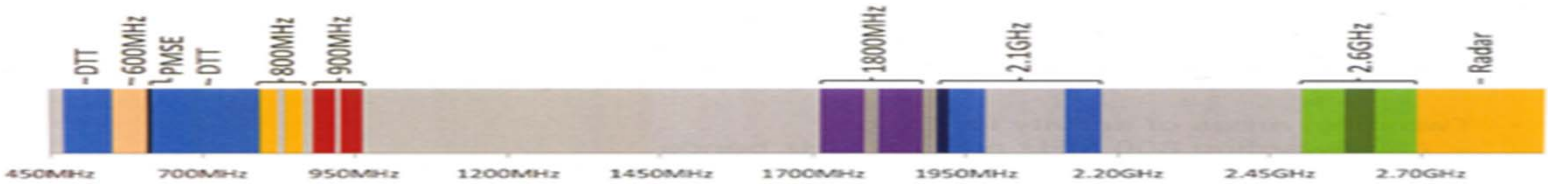




Two Possible Options for 2.3GHz



CONSIDERATION FOR AVAILABLITY, REGIONAL AND GLOBAL HARMONISATION POSSIBILITIES (SOURCE – OFCOM)

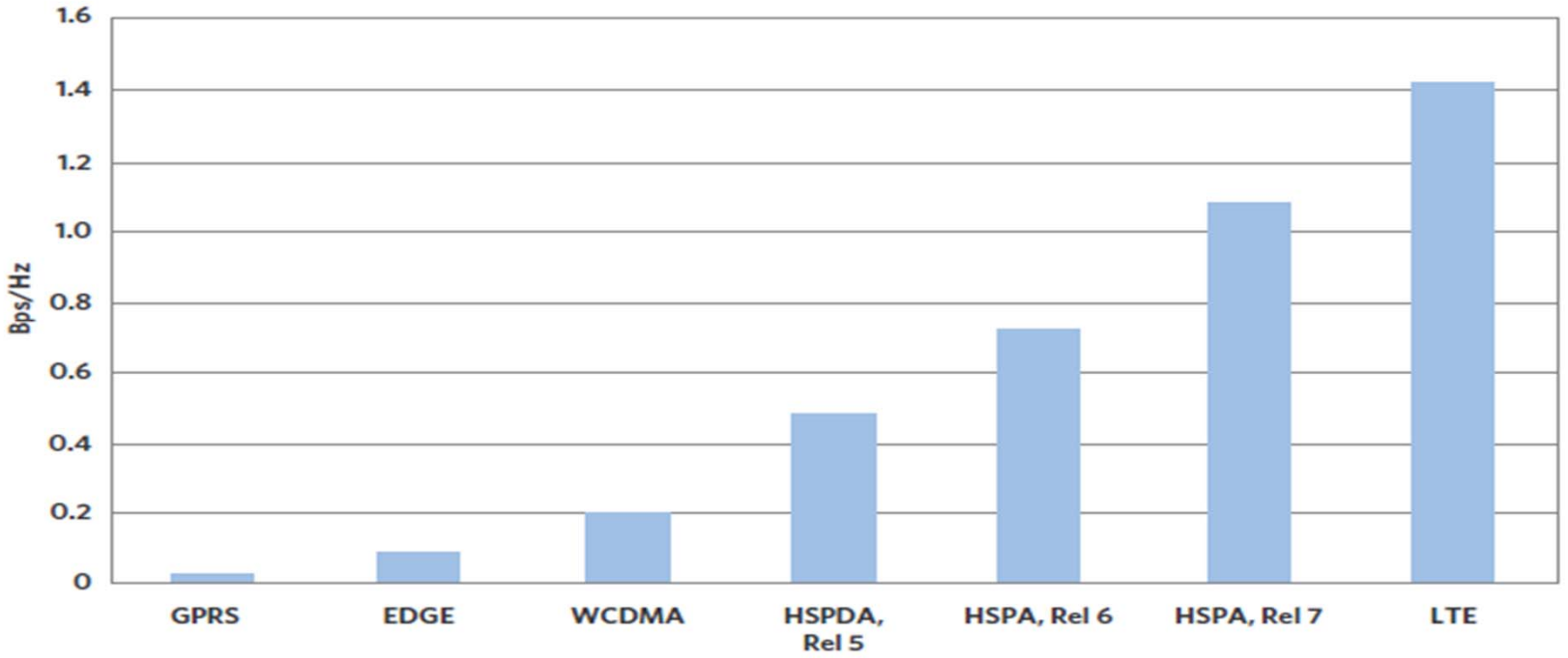


FDD		
Band	"Identifier"	Frequencies (MHz)
1	IMT Core Band	1920-1980/2110-2170
2	PCS 1900	1850-1910/1930-1990
3	GSM 1800	1710-1785/1805-1880
4	AWS (US & other)	1710-1755/2110-2155
5	850	824-849/869-894
6	850 (Japan)	830-840/875-885
7	IMT Extension	2500-2570/2620-2690
8	GSM 900	880-915/925-960
9	1700 (Japan)	1750-1785/1845-1880
10	3G Americas	1710-1770/2110-2170
11	UMTS1500	1428-1453/1476-1501
12, 13, 14, 17	*US 700*	*698-716/728-746* *776-788/746-758* *788-798/758-768* *704-716/734-746*

TDD		
Band	"Identifier"	Frequencies (MHz)
33,34	TDD 2000	1900-1920 2010-2025
35,36	TDD 1900	1850-1910 1930-1990
37	PCS Center Gap	(1915) 1910-1930
38	IMT Extension Center Gap	2570-2620
39	China TDD	1880-1920
40	*2.3 TDD*	*2300-2400*

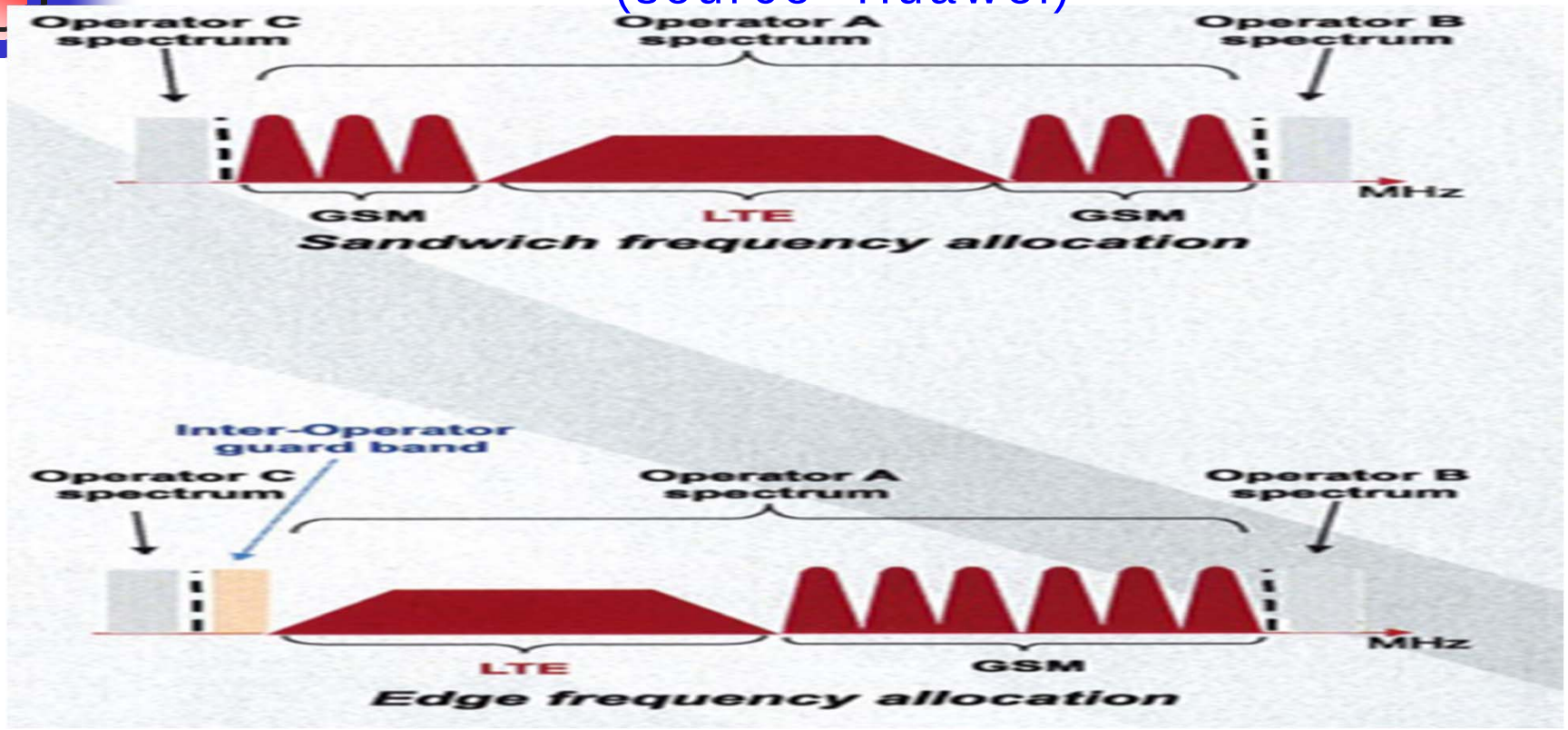
Additional (FDD&TDD)		
	3.5 GHz	*3400-3600*
	3.7 GHz	*3600-3800*

SPECTRAL EFFICIENCY IMPROVEMENT AS COMPLEMENT



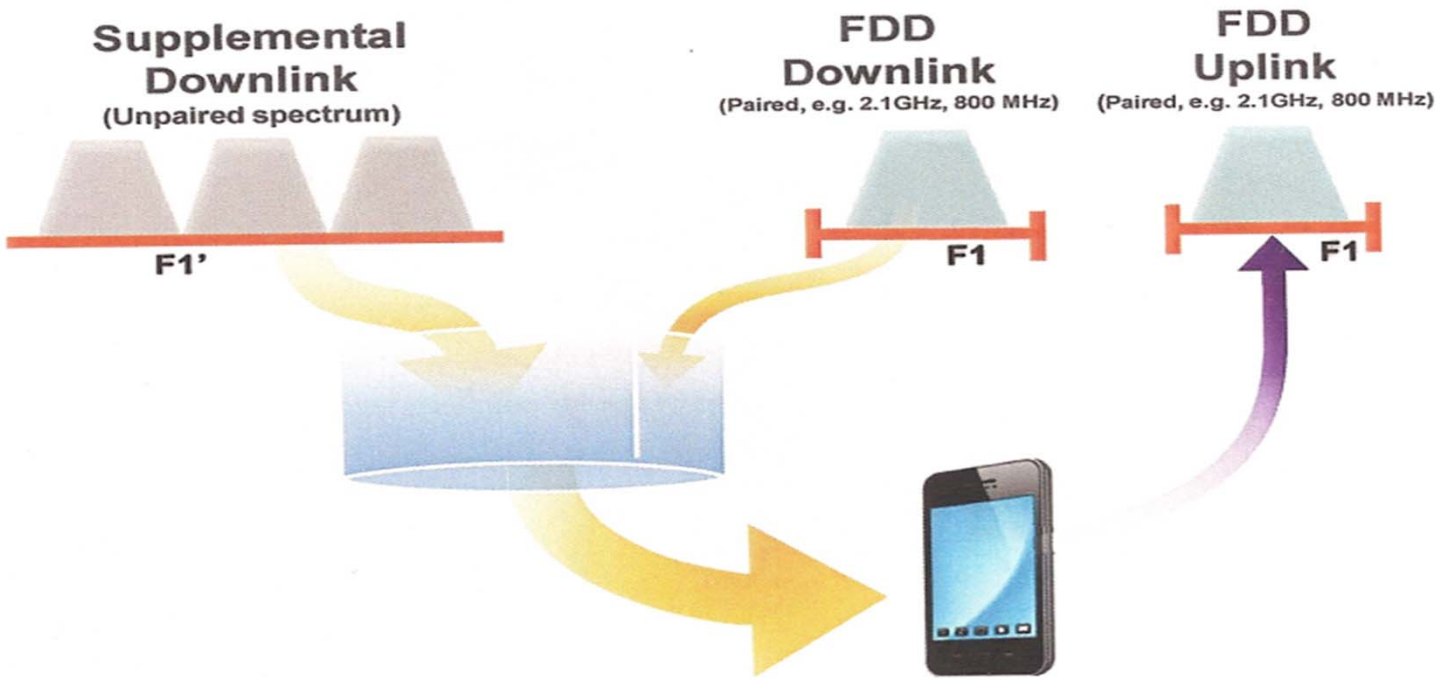
OPTIMIZATIONS: Efficiency of use –Technical spectral efficiency

(source –Huawei)



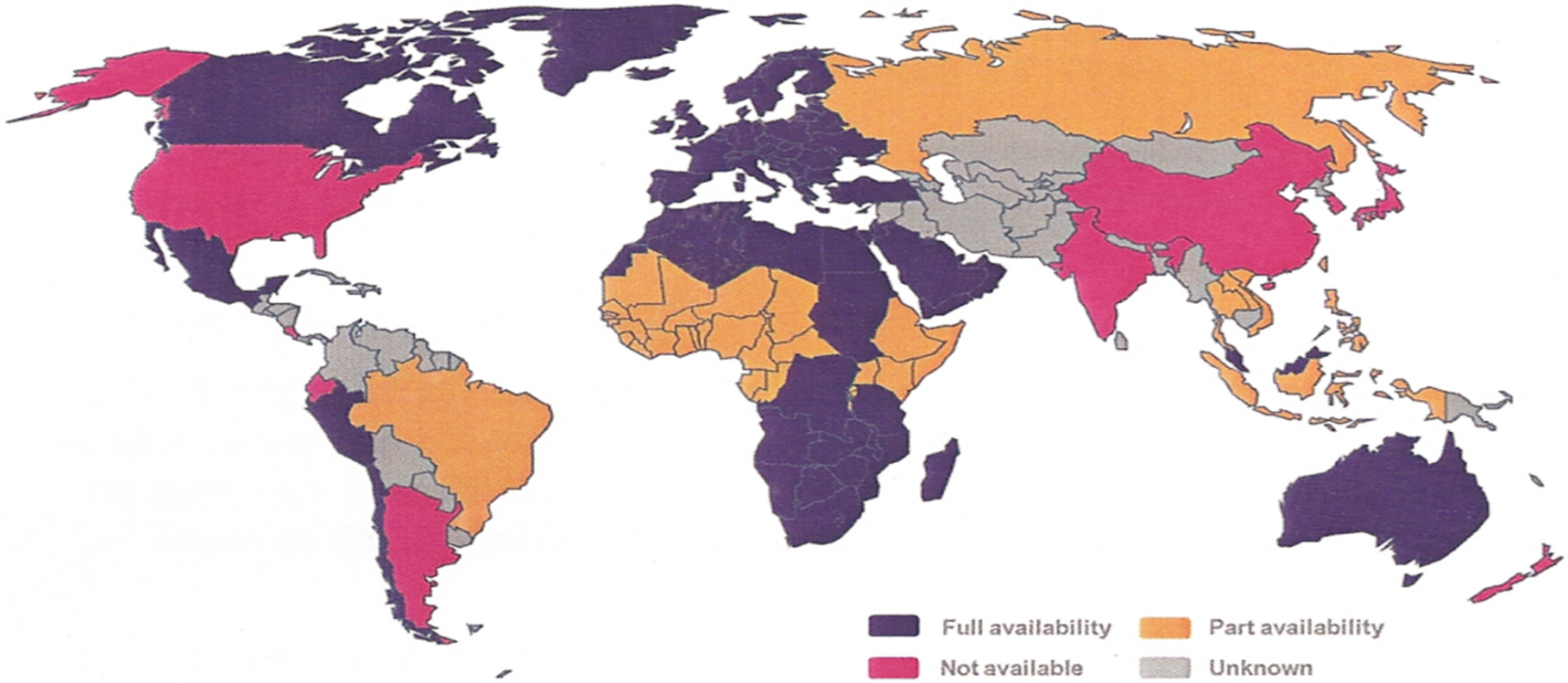
EFFICIENCY, MORE RELEASE TO SUPPORT DL (1.4GHz WRC-Target?)

(SOURCE –PLUM)



GLOBAL USAGE OF 1.4GHz

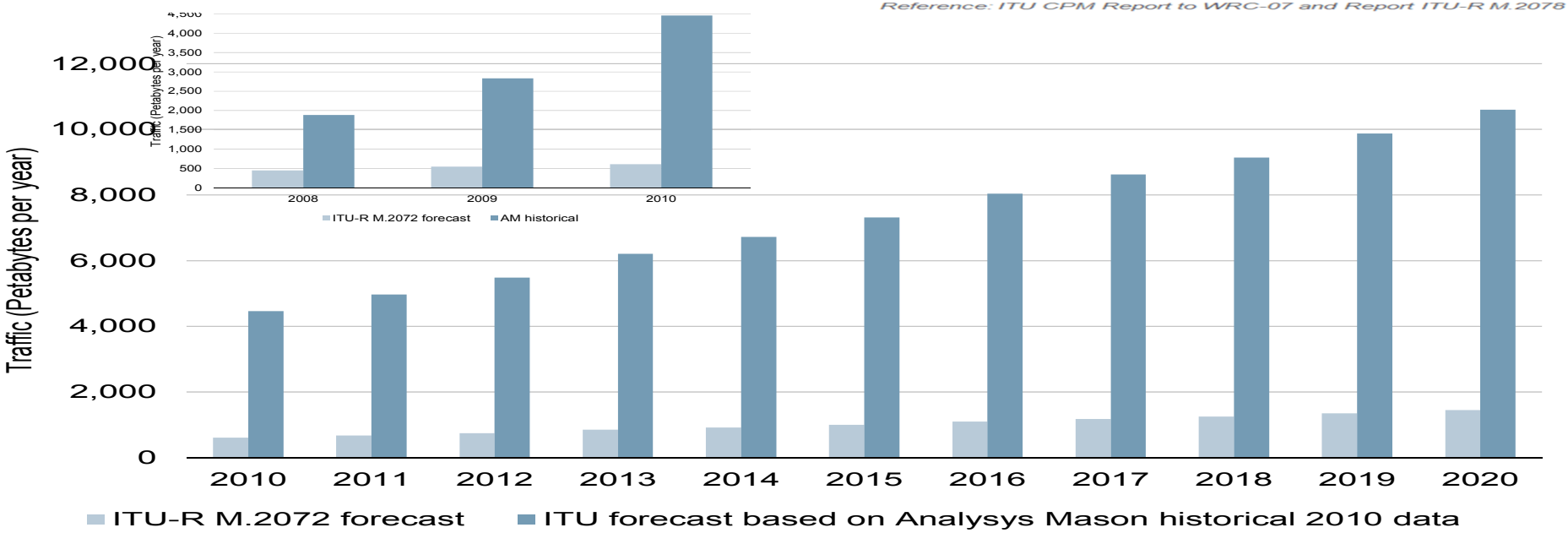
(SOURCE –PLUM)



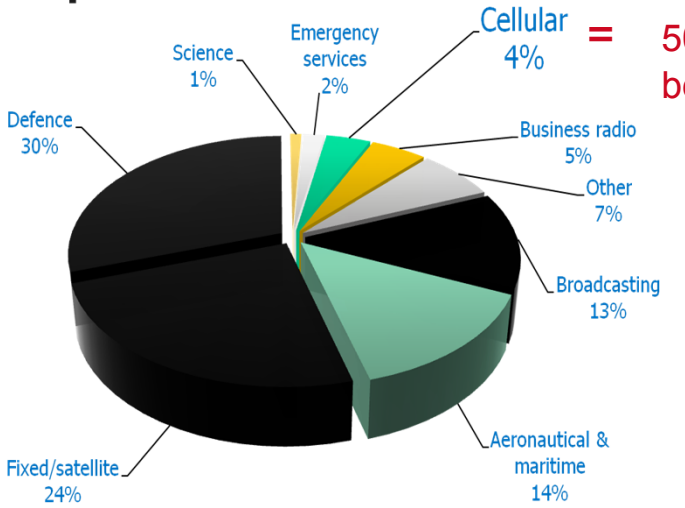
Difference between ITU-R and Other Predictions

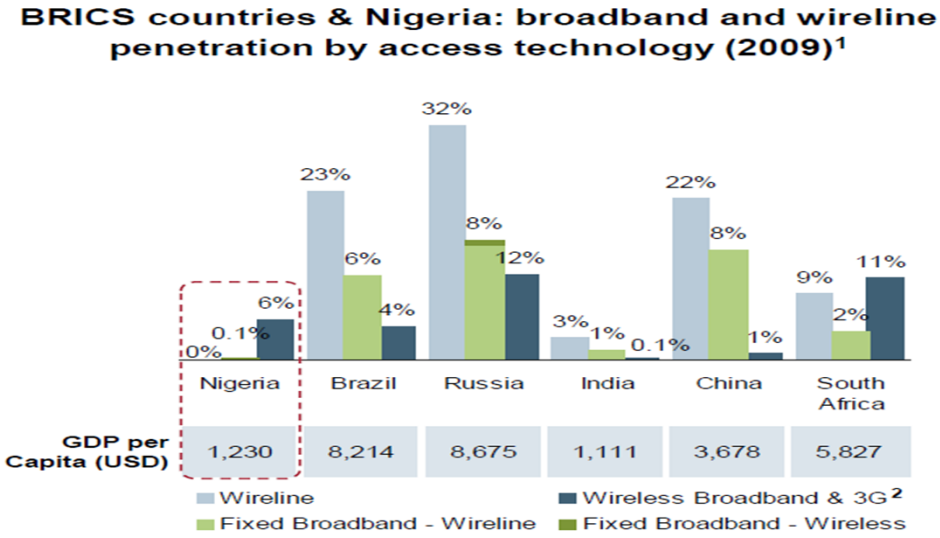
User demand setting	Predicted total (MHz)	Region 1		Region 2		Region 3	
		Identified (MHz)	Net additional (MHz)	Identified (MHz)	Net additional (MHz)	Identified (MHz)	Net additional (MHz)
Low	1 280	693	587	875	405	749	531
High	1 720	693	1 027	875	945	749	971
NOTE – Prediction based on one network deployment.							

Reference: ITU CPM Report to WRC-07 and Report ITU-R M.2078



ECONOMIC IMPACT OF MOBILE-UK STUDY



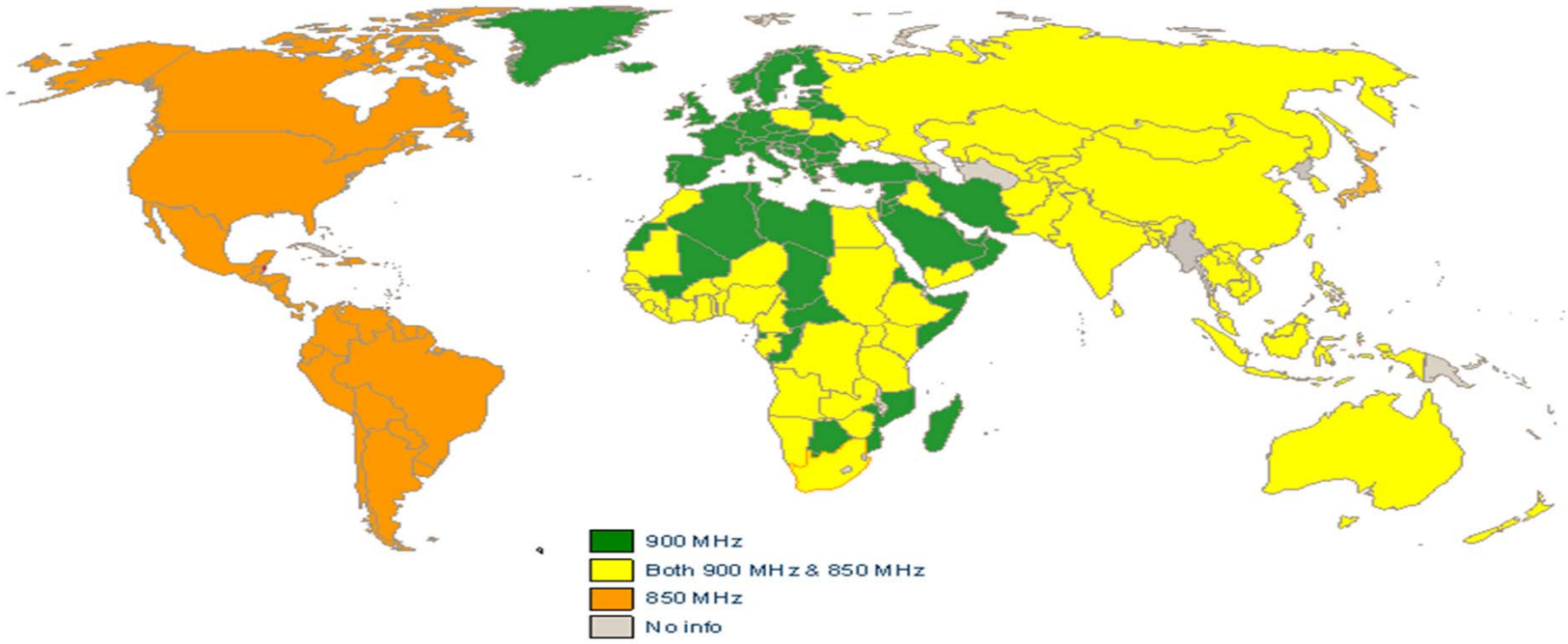


Source: Ofcom UK

Note: This has been weighted such that a 1MHz allocation at 100MHz is given equal weighting to a 10MHz allocation at 1GHz

DEPLOYMENT OF 850 AND 900MHz

ANY SIGNIFICANT DIVIDEND??



Environmental consideration
Results of Delay-1
-Country becomes dumping ground

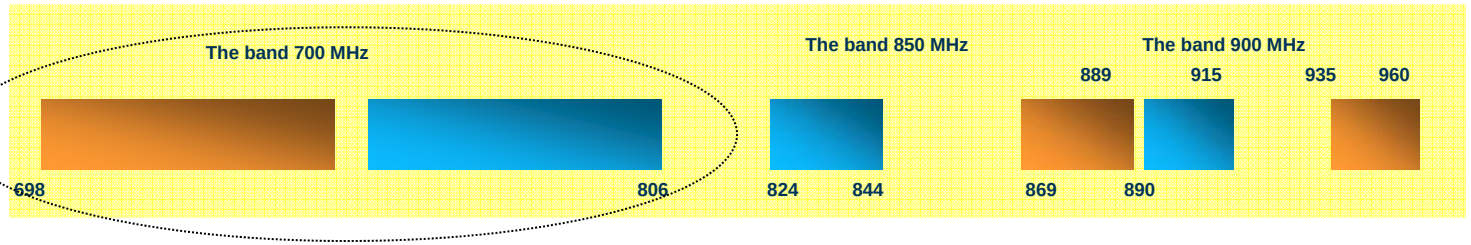




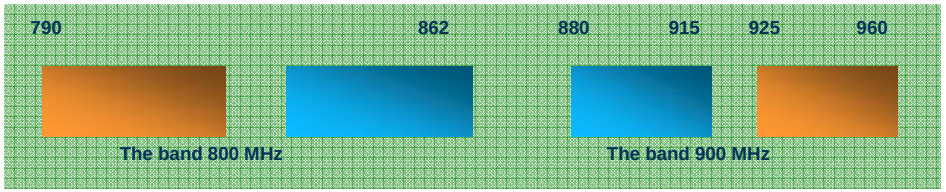


AFRICA MUST HARNESS MEANINGFUL DIGITAL DIVIDEND

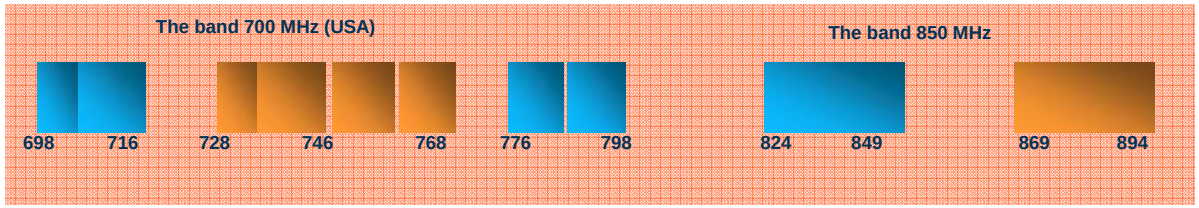
and not 790-806MHz only having Licensed the remaining



APAC/Africa
190 MHz



EME/(Africa)
130 MHz



Americas
130 MHz MHz

PLANNING OF THE DIVIDEND



(2x45 MHz)

WHAT SHOULD AFRICA PROPOSED FOR IMT IDENTIFICATION CONSIDERING OUR PECULIARITIES = 698MHz – 806MHz

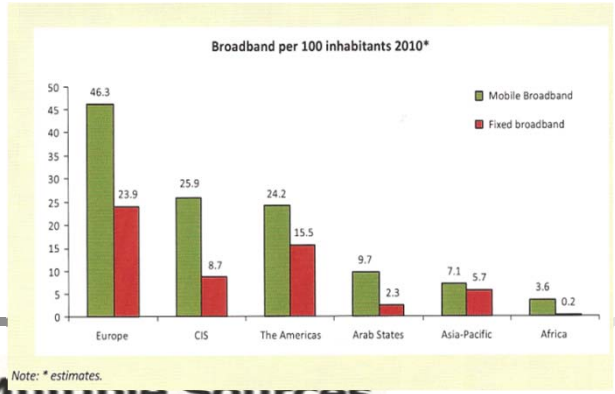
Also 1.4 and 2.2GHz Bands

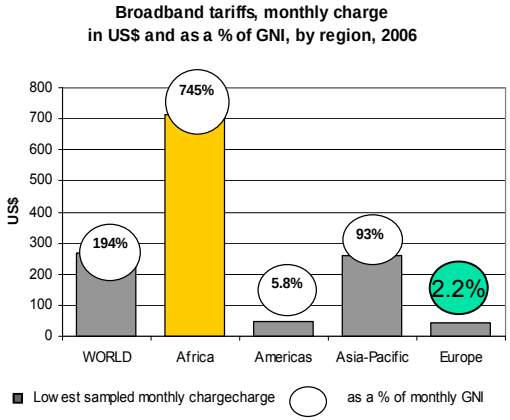
Consideration for other Impact of Delay

- **Loses for Delayed-Implementation (Revenue hungry politicians)**
  - **License fees for Two Major-Telcos (25MHz price of over $300m x 2) in 10 years =$600+**
  - **If amortized over the period ($60m/year Loss on Spectrum License fees alone), Losses in Tax-Collectable (>$10m/year)**
  - **Lost opportunity for e-health, e-education, e-commerce and many others**
- **Consumer loses -anything up to half prices for telecoms services in view of expected increase in competition**
- **Potential Telcos -lost opportunity cost (+ Less than half-price in Deployment/Coverage cost)**

What to Remember when for WRC 12







Comparing Forecasts from Multiple Sources

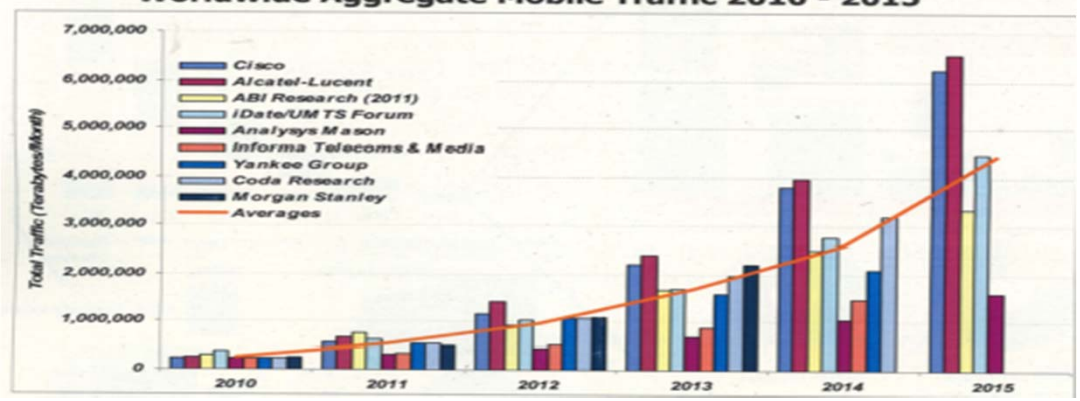
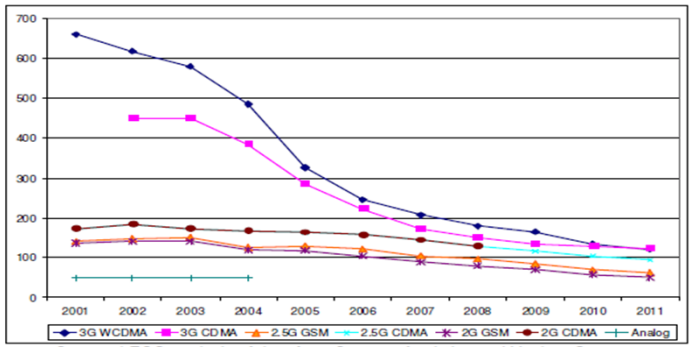


Figure 4: Average selling price for handsets (ASP)



Source: LECG analysis of data from Strategy Analytics and Yankee Group.

NIGERIA's Proposal on A.I 8.2 of WRC-12 – Other Regions are heading for the Same Direction

We need, and will continue to propose Additional Allocation to IMT/Mobile BB and Harmonization.

We anticipate ATU Adoption and are pleased to note similar proposals from other regions



CONCLUSIONS

- **Have Discussed**
- ICT Status of Africa
- Demand Consideration and Result of some studies
- Steps to follow Including Study, Optimize and efficient use, spectral efficiency, ITU WRC work (
- Economies of scale (ITU Identification, Allocation, and Harmonization of Spectrum)
- Plan Well going by the most popular standards

THE END



I Thank You all

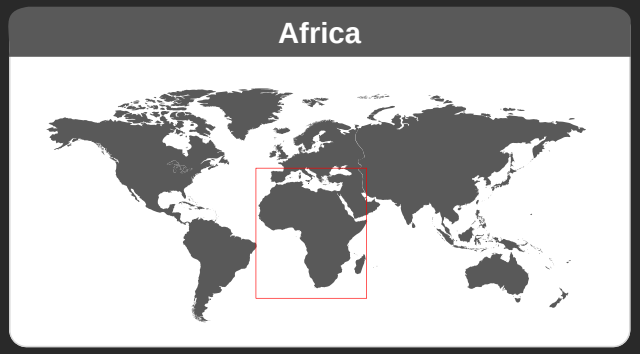
Creating the perfect regulatory environment for mobile broadband

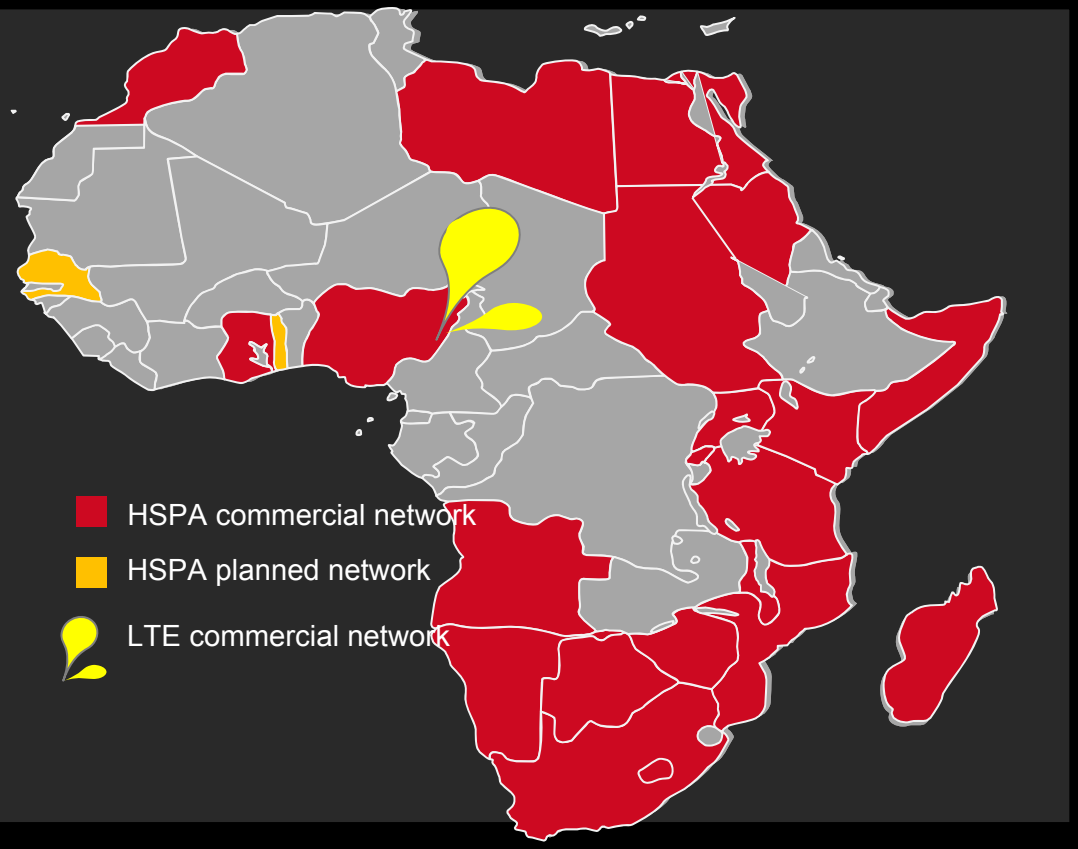
Peter Lyons

Sept 2011



African Mobile Broadband Penetration





To date in Africa:

- 39 live HSPA deployments
- 5 enhanced with HSPA+ deployments
- 1 LTE deployment
- 5 planned LTE deployments

© GSMA 2011

5 main regulatory levers influencing the economic model for MBB

Spectrum availability

- Frequency band drives the number of base stations and investment level
- Allocated spectrum determines capacity per base station and required density of infrastructure

Infrastructure/ spectrum sharing

- High capex for base stations can be reduced by active site sharing
- Crucial for rural and low-density areas where there are sharing no spectrum capacity constraints

Coverage obligations

- Extensive coverage obligations increase investments, leading to higher cost per subscriber and higher retail prices

Industry structure

- Higher number of players lead to
  - Lower availability of spectrum
  - Lower market share and higher cost structures
  - Less investment in rural areas given lower returns

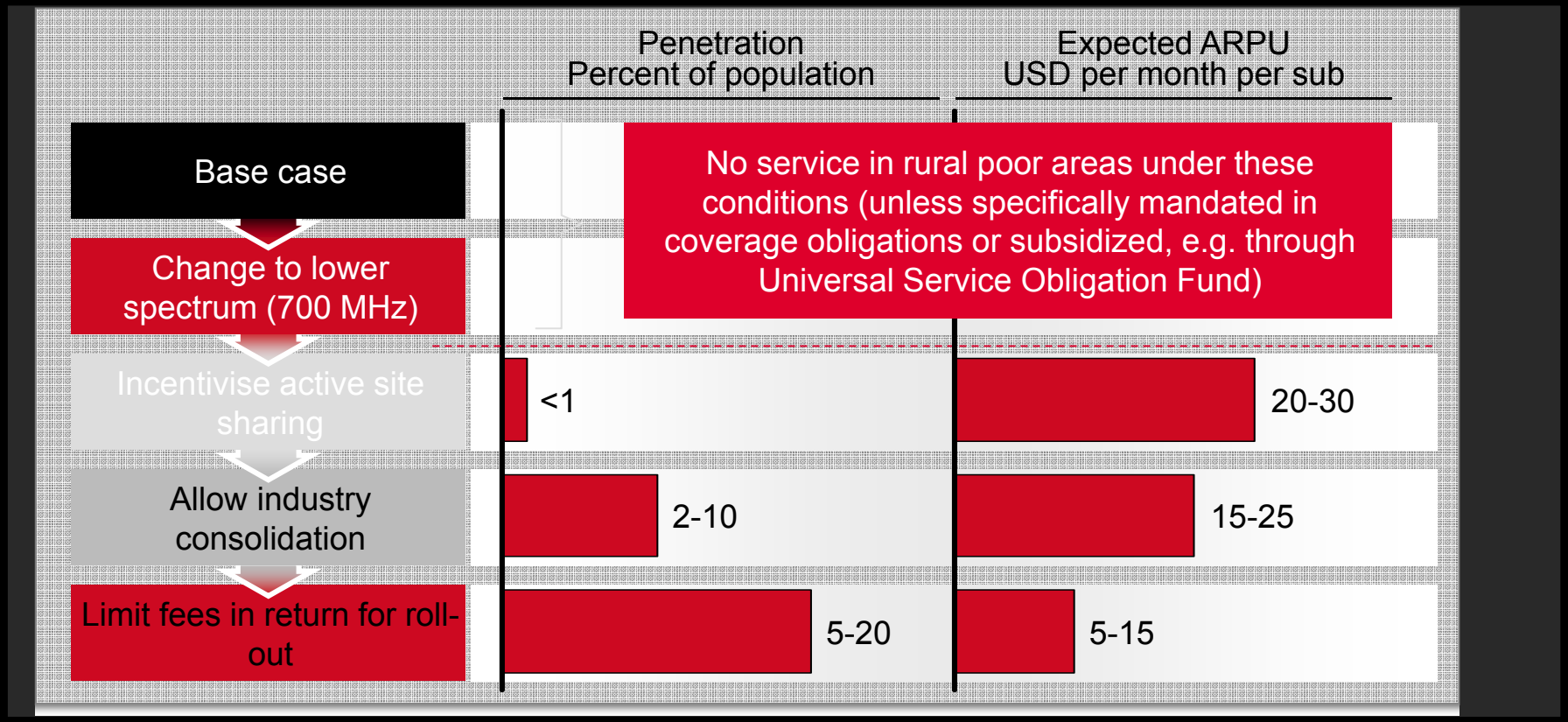
Spectrum/ license fees

- High fees reduce operators' resources that can be invested in infrastructure deployment or more affordable price levels for broadband

© GSMA 2011

Source: McKinsey

Encouraging significant adoption of mobile broadband for rural areas

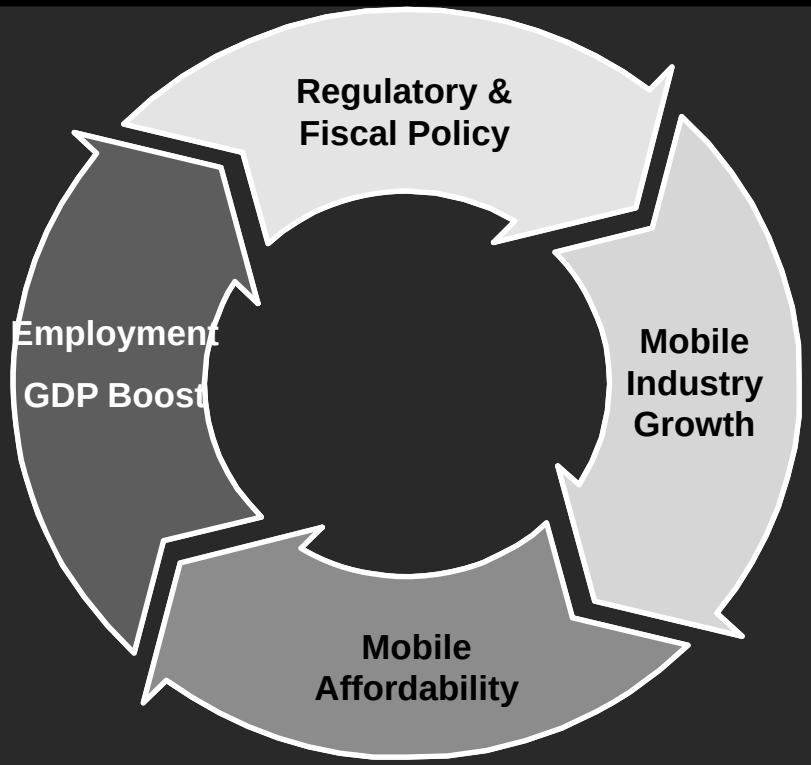


Source: McKinsey

© GSMA 2011

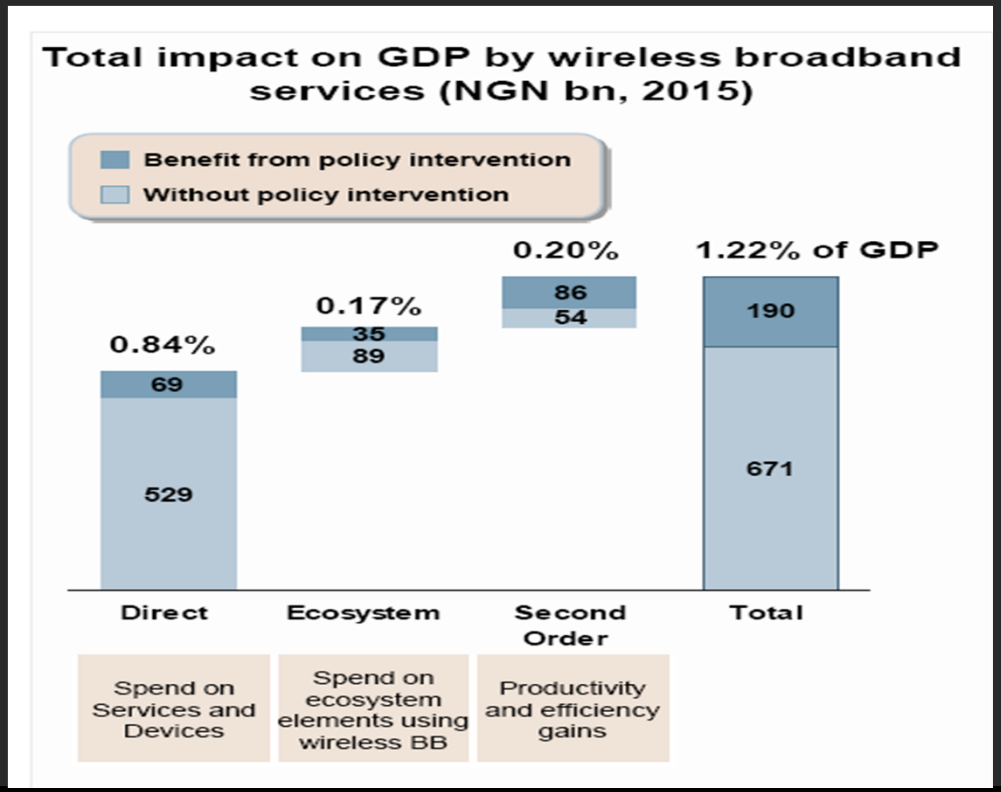
Development Circle

- What worked for voice will work for data
- Governments and regulators play a key role
- With the right environment Private investors can deliver (amazing things!)
- Critical is developing the right investment environment



© GSMA 2011

Broadband: 1.22% of Nigerian GDP in 4 Years



- Mobile broadband – driven by HSPA and LTE - can make 1.22% contribution to Nigerian economy by 2015
- Broadband will add to existing contribution by mobile voice
- Benefits amplified by development of digital economy

© GSMA 2011

An inclusive world



Mobile Money for the Unbanked
Giving 20m people access to financial services for the first time by 2012



Mobile Agriculture
Providing agricultural support services to over 5m farmers in India and Kenya



mWomen
Aiming to give ownership of mobile phones to 150m women globally for the first time



Green Power for Mobile
Delivering 180k green-powered mobile base stations and providing power to those off-grid

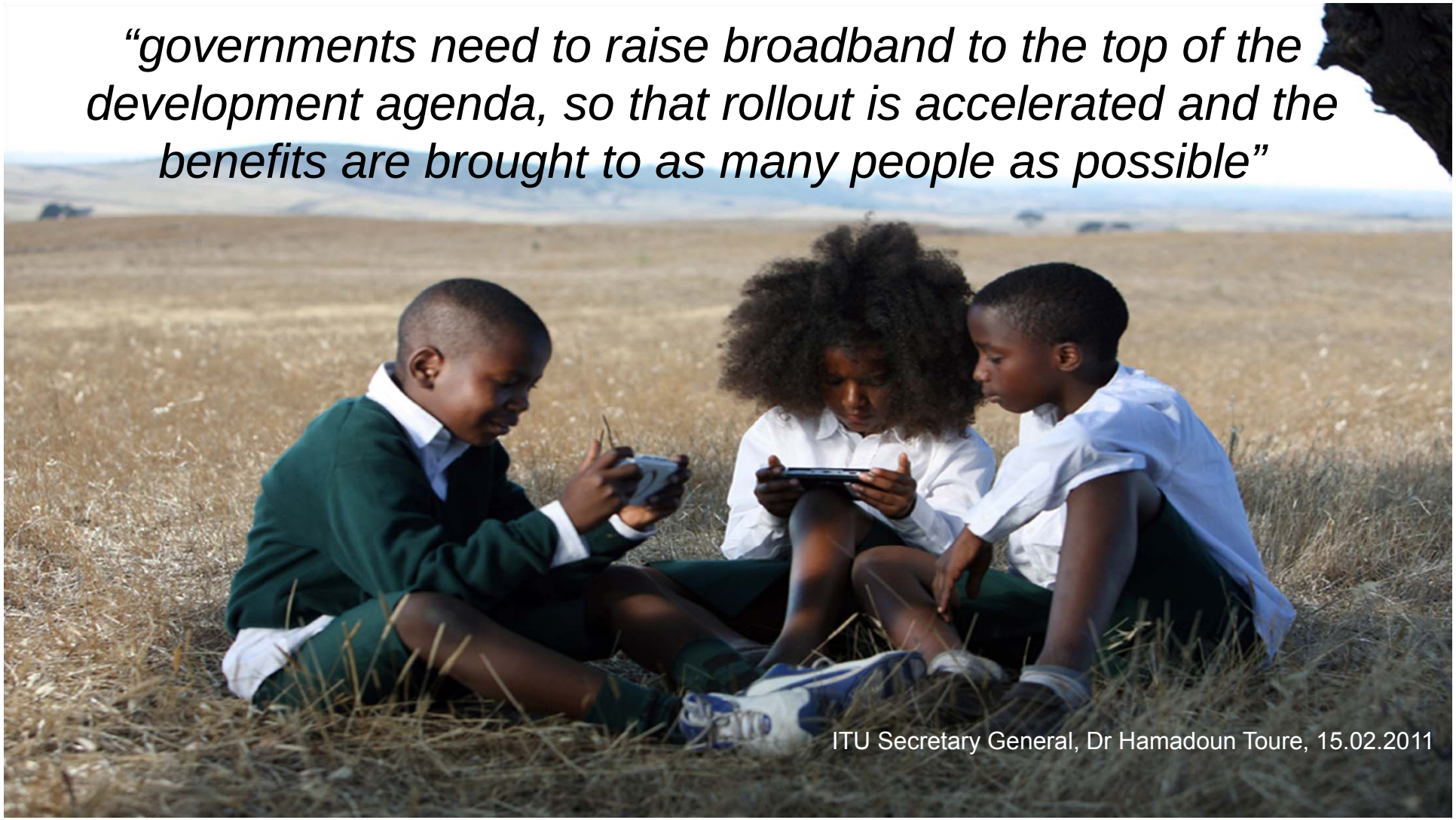


Mobile Health
Using mobile technology to reduce child mortality and helping to manage infectious diseases



Mobile Education
Enabling accessible life-long learning to support economic and social development goals

“governments need to raise broadband to the top of the development agenda, so that rollout is accelerated and the benefits are brought to as many people as possible”



ITU Secretary General, Dr Hamadoun Toure, 15.02.2011

Thank You

Questions?

Restricted - Confidential Information
© GSMA 2011
All GSMA meetings are conducted in full compliance with the GSMA's anti-trust compliance policy



Nigerian Discussion Panel

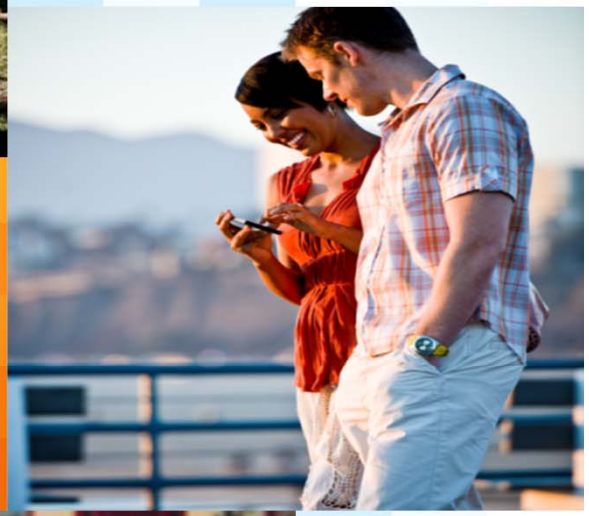
Chaired by
Ross Bateson
Special Government Adviser, GSMA



Overview of Regulatory and Spectrum Issues in Nigeria.

GSMA Mobile Broadband Workshop

Lagos 19th September 2011





Outline

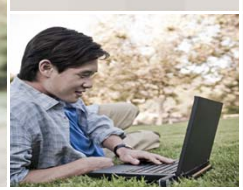
- Introduction
- Spectrum Landscape in Nigeria
- Issues for Consideration
- Leveraging Regional and Global Opportunities

Qualcomm Is the World Leader in Next-generation Mobile Technologies

- Celebrating 25 years of driving the evolution of wireless communications
- Making wireless more personal, affordable & accessible to people everywhere
- World's largest fabless semiconductor company, #1 in wireless
- S&P 100 / S&P 500 / Fortune 500



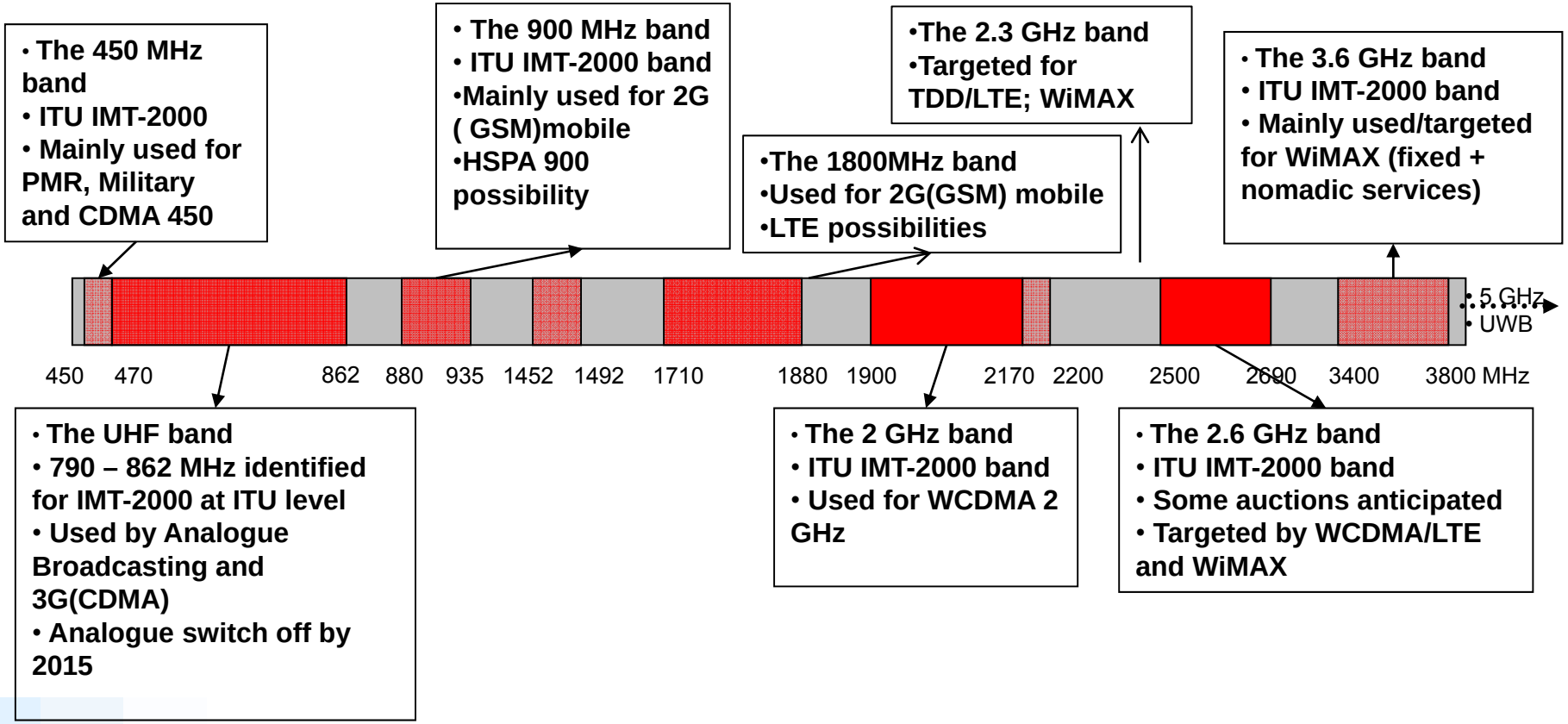







GROWTH DRIVERS
2G to 3G Migration
Emerging Regions
Smartphones
New Device Categories
Advanced Technology

Spectrum Landscape in Nigeria



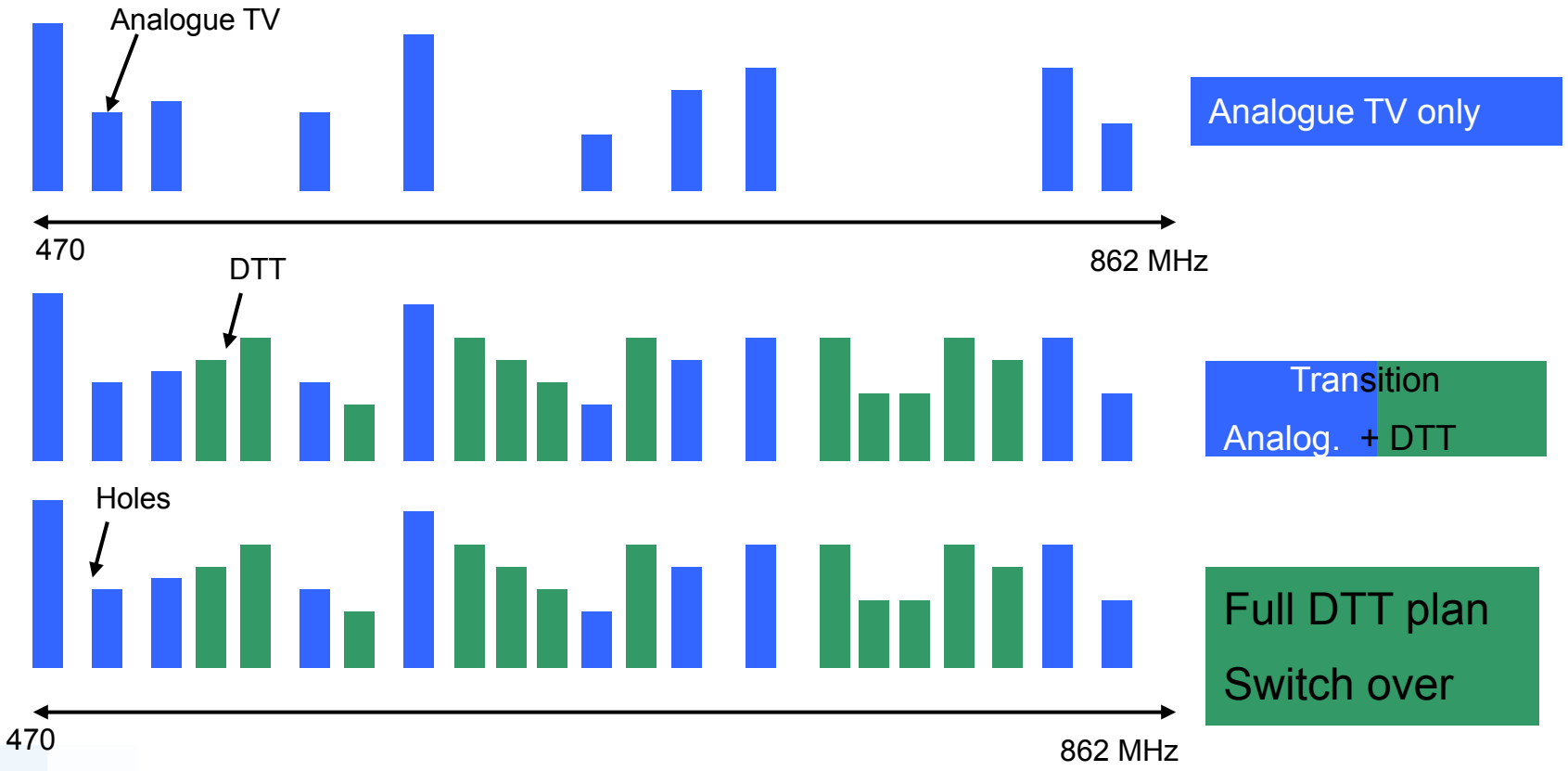
Issues for Consideration

- Current Status
  - Efficient/effective use of IMT spectrum
    - Government policy objectives
    - Coverage of all areas, including rural areas
    - Access to internet
  - Unassigned/Underutilized Spectrum
- Sourcing Additional Spectrum to Accommodate MBB growth
  - What are the Options:
    - 2.3 GHz band
    - 2.6 GHz Band
    - UHF Band
    - Refarming 900MHz and/or 1800MHz
    - New Allocations

Issues for Consideration Cont'd

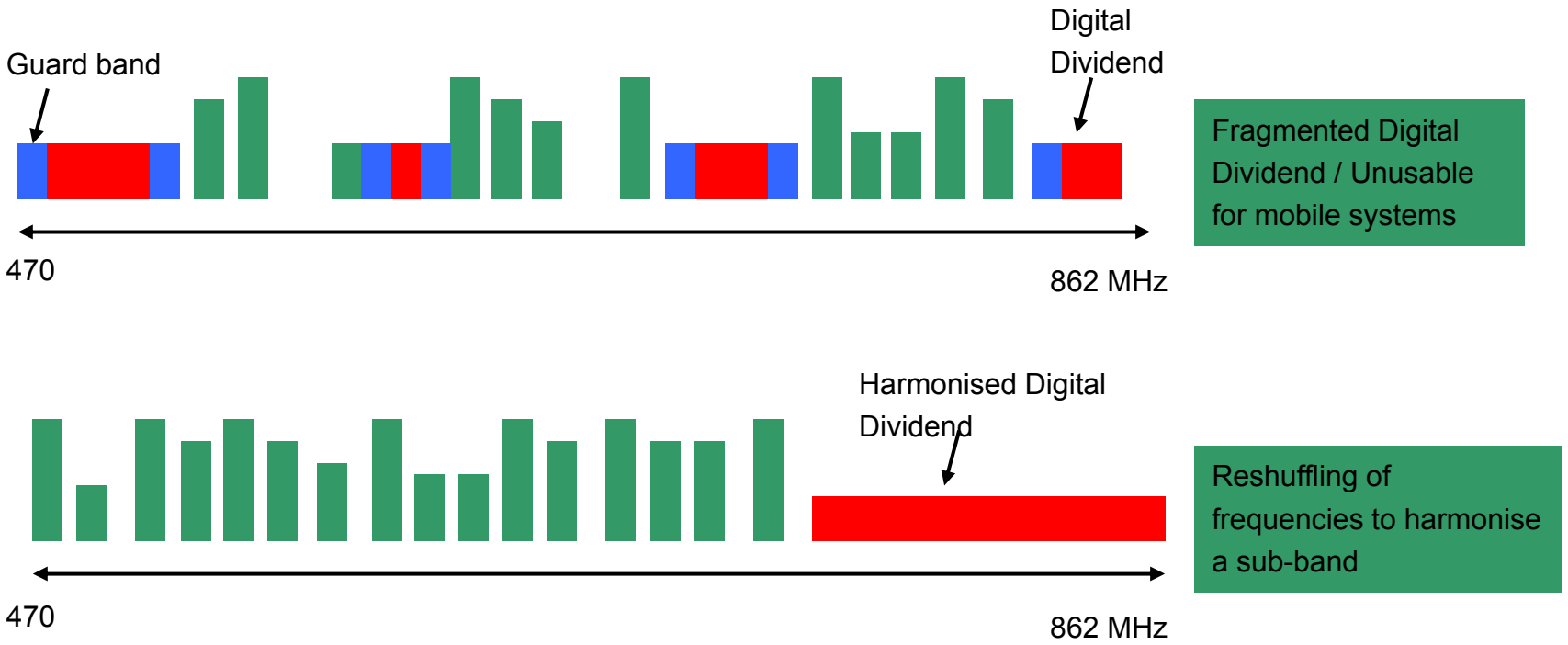
- Accommodating Broadcasting and Telecoms Spectrum Needs (I)
  - UHF Digital Dividend(DD)
    - Determine the Actual DD
      - Spectrum arising from digital switchover
      - Spectrum made available over and above spectrum required to accommodate existing analogue TV services in digital form
    - Understanding the available spectrum after switchover:
      - Estimation of broadcasting needs/utilization
  - Future Use of the DD
    - Evidence based process to decide on services to accommodate in the DD:
      - DTV
      - New Advanced Broadcasting Services
      - BWA and MBB (IMT; IMT Advanced)
      - Mobile TV
      - Etc
  - Avoid Fragmentation and adopt a frequency plan that accommodates all services efficiently

Efficient Use of The UHF Digital Dividend: Fragmentation Risk



Qualcomm Proprietary

Harmonisation is a prerequisite for efficient spectrum use



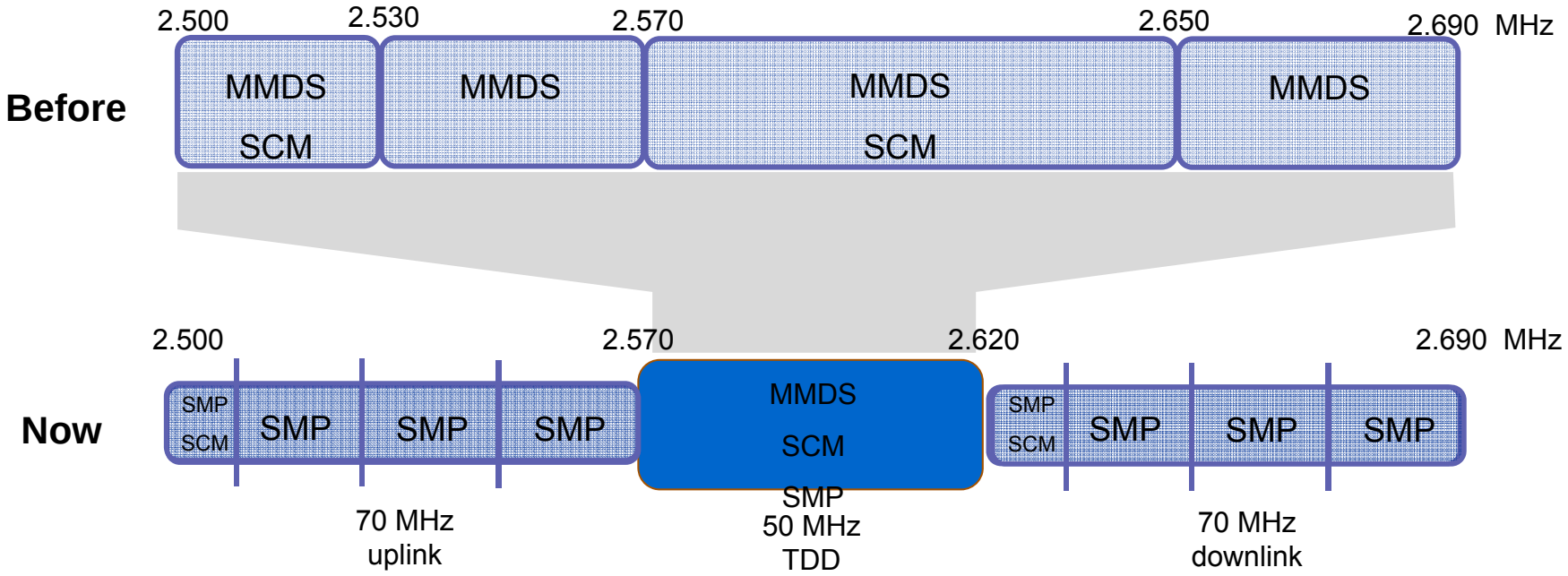
Qualcomm Proprietary

Issues for Consideration Cont'd

- Accommodating Broadcasting and Telecoms Spectrum Needs(II)
  - 2.6 GHz Band
    - Brazil Example
      - In Aug 2010, ANATEL, the Brazilian regulator, approved the re-allocation of the 2.6 GHz band. The entire band was allocated for mobile services (SMP) on a primary basis, while keeping some of the band also allocated for MMDS and Multimedia Communication Services (SCM) as a co-primary allocation.
      - The center gap is allocated for MMDS, SCM and SMP, the price of the spectrum license will depend on what they will provide.
      - The concept of restricted radiation will be applied for SCM in order to allow some mobility to SCM which, according to the definition is a fixed service.
      - 15 MHz in the TDD spectrum will be reserved for the government for 5 years. If they don´t use during this period, ANATEL will action for mobile the private sector (SMP operators or SCM operators)
      - ANATEL is expected to publish a public consultation on the 2.6 GHz auction rules in 2H11. The auction should take place by April 2012.

Issues for Consideration Cont'd

2.6 GHZ IN BRAZIL



Leveraging Regional and Global Opportunities

- Consultation between government and Broadcasting and Telecomm Stakeholders
- Sub regional alignment within ECOWAS
- Regional Initiatives (e.g. Africa Telecommunications Union)
- Global activities (e.g. ITU WRC-12)



Thank You

Follow us on:

Elizabeth Migwalla
Senior Director Government Affairs-Africa
emigwall@qualcomm.com

For more information on Qualcomm, visit us at:

www.qualcomm.com

www.qualcomm.com/blog



GSMA Broadband Workshop, Lagos, September 2011

The Digital Dividend: Global Phenomenon?

Ross Bateson, Special Adviser, Government Affairs

GSM Association

Key Activity on Digital Dividend

1. 2008-2009: Recession drives broadband policy: DD is central to this
2. 2008 – Digital Dividend auction in US is first in the world
3. LTE live in Europe since 2009: significant infrastructure investments throughout 2011
4. Digital Dividend coming online in many European markets in 2011/2012



© GSM Association 2011

2008-2009: Recession Drives Broadband Policy

- Rapid roll-out of broadband infrastructure has roots in the recession
- Governments turned to broadband as driver of economic growth and jobs
- Head of State-lead broadband policies spread across Europe from Spain to Russia in 18 months
- European Commission provided useful guidance. . . but politics start at home
- Digital Dividend key pillar in all policies



© GSM Association 2011

Key Policy Elements



France Numerique 2012

- All French inhabitants must have broadband access by 2012
- Digital divide must be lowered
- 154 measures under its digital economy plan
- 400 cyberbases will be created in schools
- TV must be digital by end-2011



Digital Britain

- Prime Minister Gordon Brown launched Digital Britain in 2009
- 3-year plan to launch digital participation
- Universal access to broadband by 2012
- Programme intricately tied into UK budget and taxation scheme

© GSM Association 2011

Enabling the Digital Dividend: Common Policies

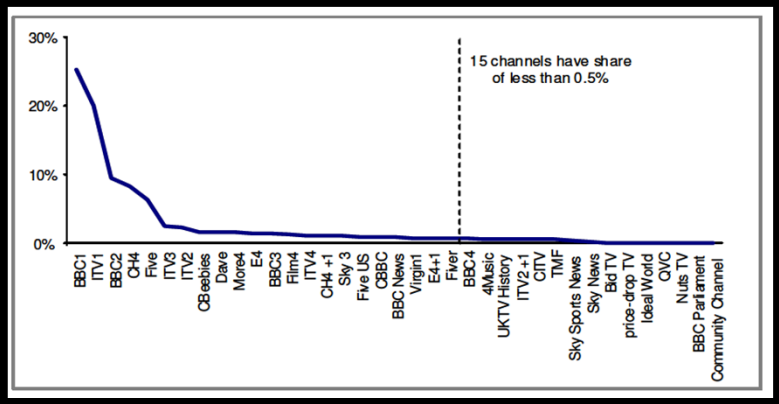
- Move towards DD allocation in Europe has similar themes across the Continent:
  - Head of State-level endorsement and sponsorship
  - Private sector is relied on as the service provider
  - Government role is to encourage and enable communications sector
  - Clear and detailed guidelines on responsibilities and resources

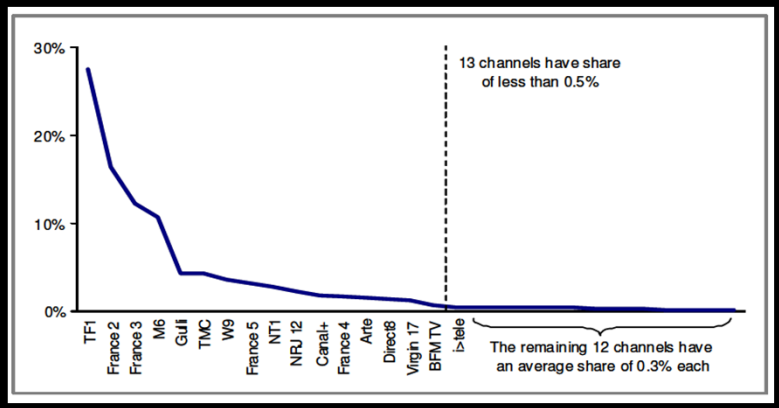


© GSM Association 2011

Massive Multi-Channel Myth Debunked

- Research from Europe as DTV started to mature (2008) shows real broadcast need and data like this SIGNIFICANTLY eased DD allocation
- Both UK and France cases show heavy tail-off after first 6-10 channels
- In both cases, the top channel accounts for more viewing than all channels outside top 6
- DTT is inefficient medium for distribution of very small channels



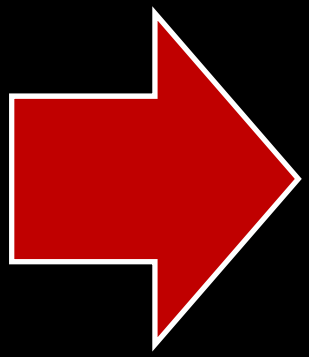


© GSM Association 2011

Auctions So Far – Digital Dividend

Activity limited to Europe and North America

- US (January 2008)
- Germany (May 2010)
- Sweden (March 2011)
- Spain (July 2011)
- Italy (September 2011)

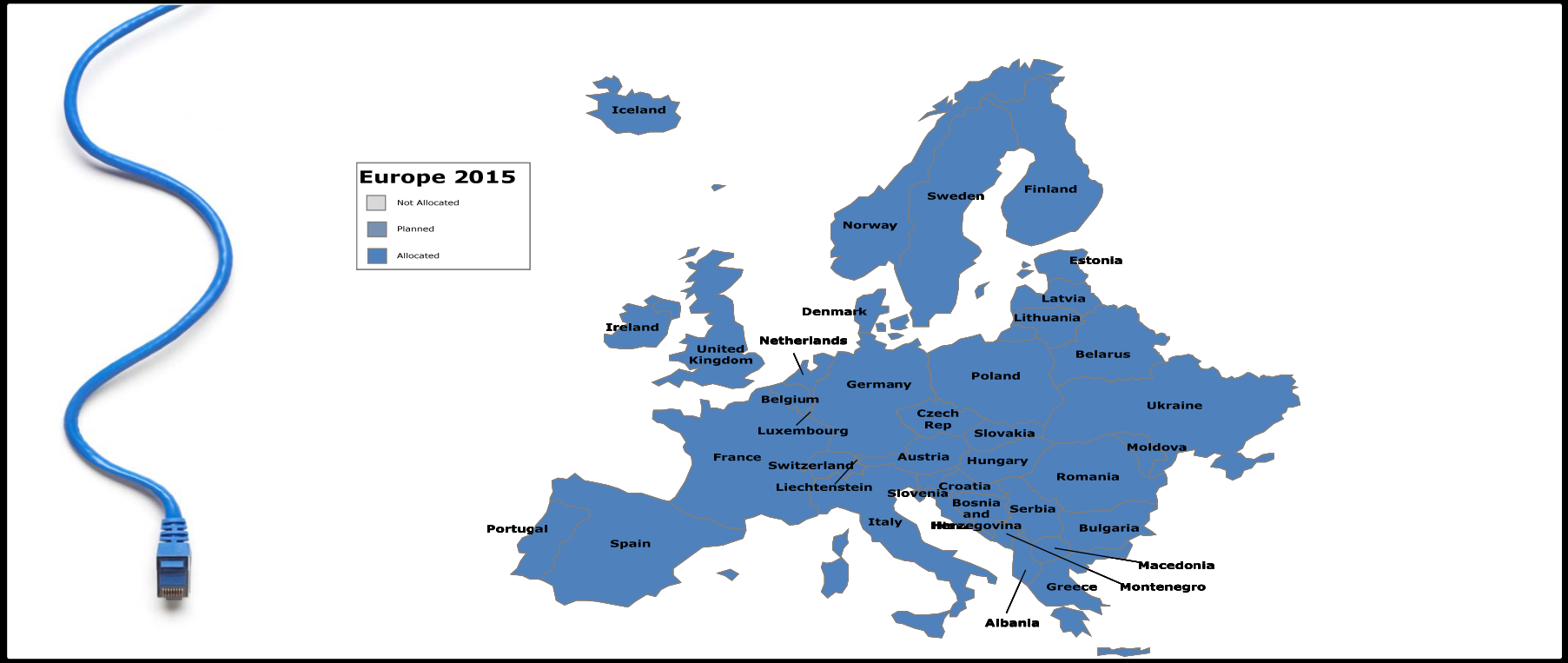


Possible 2012 Auctions in Key Markets

- Canada
- South Africa
- India
- Chile
- Australia
- Peru

- . . . And multiple European markets

Europe: Awards Largely 2011-2013



© GSM Association 2011

Elsewhere: 2 x 45MHz

- Asia Pacific Telecommunity has developed a 2 x 45MHz plan using the spectrum 698-806MHz
- Many countries in CITEL will also follow this band
- The ecosytem using this band is likely to be very large, with a huge population coverage
- However, no allocations have yet been made
- . . . but some should follow in the next 12 months

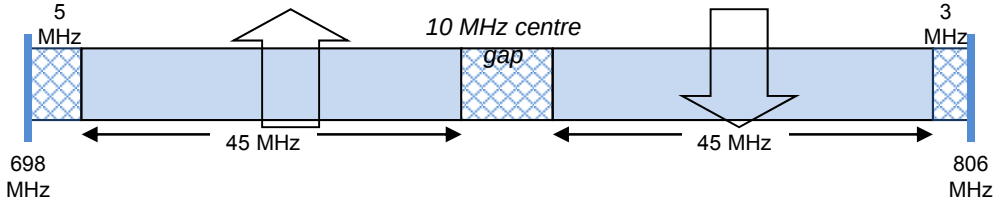


Figure 1: APT Harmonised FDD Arrangement of 698-806 MHz band

© GSM Association 2011

Africa / Europe Population Coverage

Country	Pop/km2	
Angola	14.838	75% Rural
Chad	8.78	
Cote d'Ivoire	65.3	
The Gambia	150.95	60% Rural
Ghana	99.9	
Kenya	68.5	
Mali	11.7	51% Rural
Nigeria	167.49	
Senegal	63.7	
South Africa	40.3	42% Rural
Zambia	17.1	

Comparison:		
UK	246	
Germany	232	12% Rural
Netherlands	400	

- Low population density of African continent is ideally suited to Digital Dividend spectrum
- Low-population countries with fewer operators can use wider, cleaner channels to provide higher bandwidth services

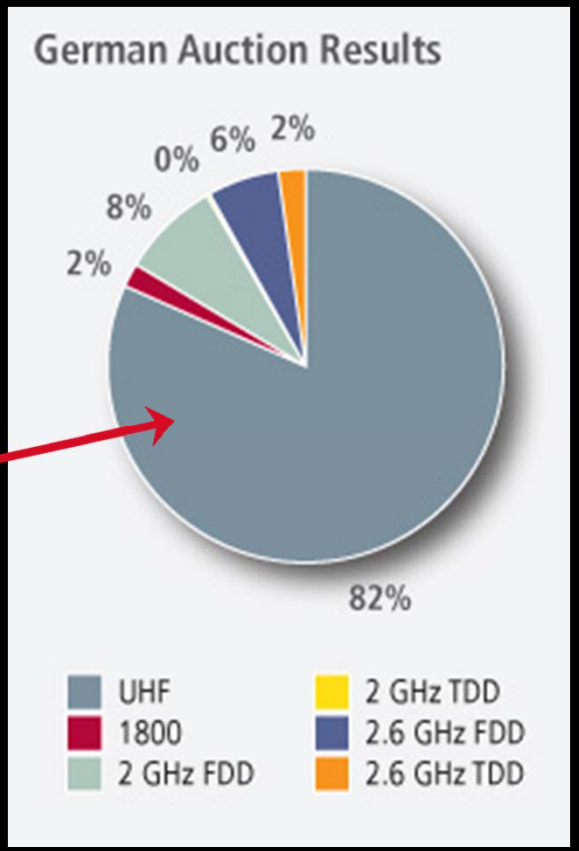
© GSM Association 2011

German Auction Shows Importance of Digital Dividend

Comparison:	
UK	246
Germany	232
Netherlands	200

12% Rural population

82% of Auction value for 7.5% of spectrum



© GSM Association 2011

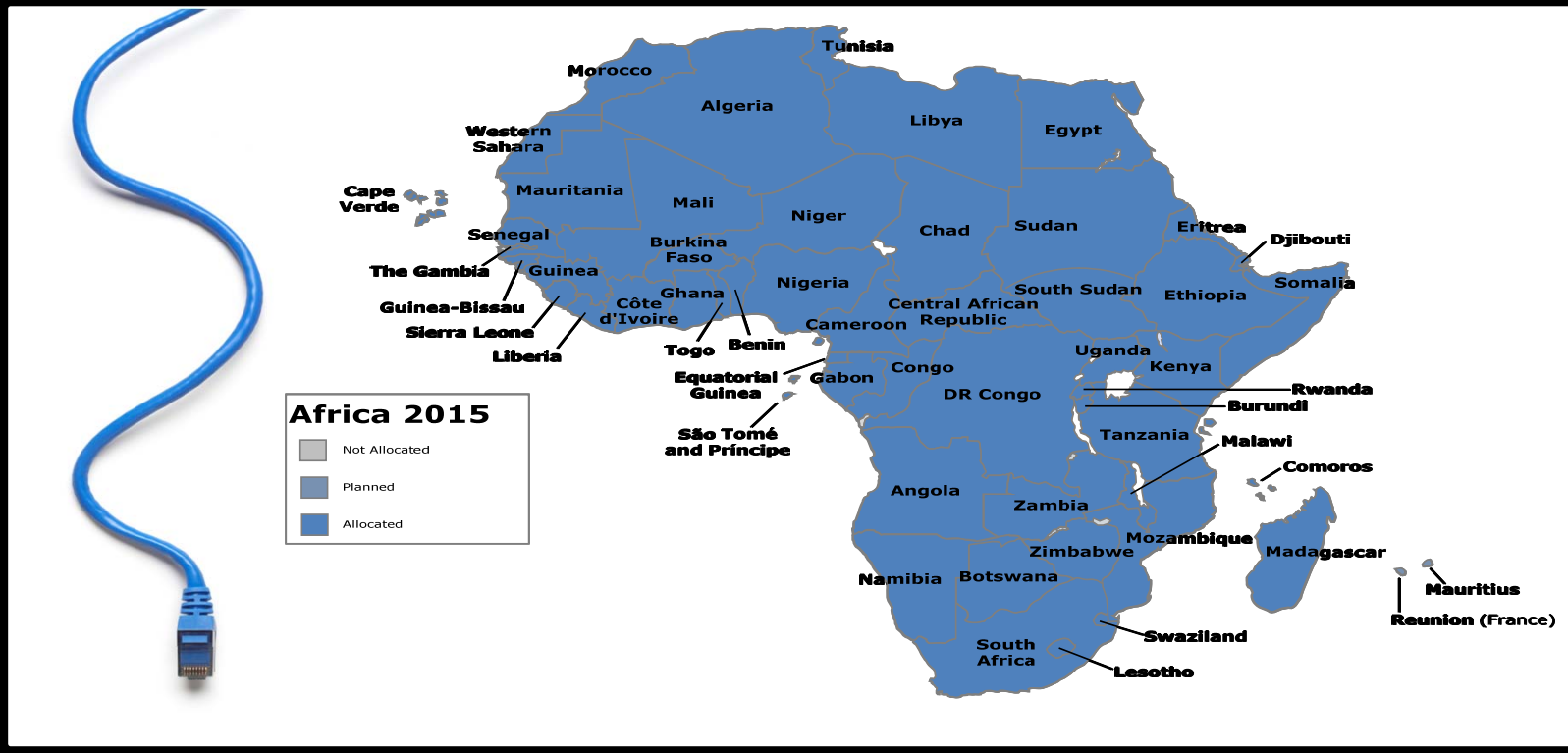
Risks of Allocation Delay in Africa

- Slow move towards digital TV remains primary barrier in much of Africa
- Risk of regulators using auctions as governmental cash cow will damage universal access
- CDMA 800 allocations cause significant problems in some countries
- Complexity of cross-border interference issues must be realised and negotiated



© GSM Association 2011

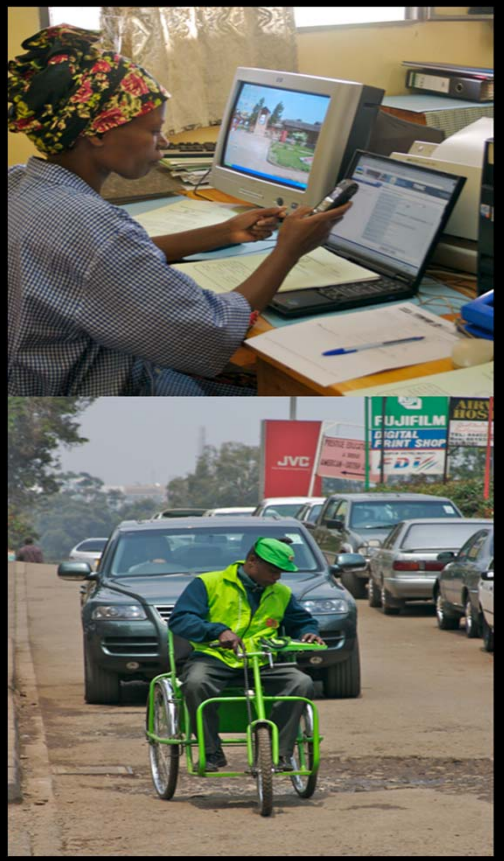
Will Africa Be Ready by 2015?



© GSM Association 2011

Conclusions

- Digital Dividend is starting to help broadband infrastructure to develop at phenomenal pace
- Where government initiatives have promoted Digital Dividend development, allocations have accelerated
- Significant barriers have been overcome in Europe, and are starting to be removed in Africa
- The growing ecosystems of Digital Dividend products will benefit Nigerian consumers



© GSM Association 2011



THANK YOU!

www.gsmworld.com

Restricted - Confidential Information
© GSM Association 2011
All GSMA meetings are conducted in full compliance with the GSMA's anti-trust compliance policy

SHARING THE DIGITAL DIVIDEND BAND

A PAPER DELIVERED

by

ENGR. GBENGA ADEBAYO

Chairman, Association of Licensed Telecommunications Operators of Nigeria (ALTON)

at

GSMA FORUM

on

MONDAY, 19TH SEPTEMBER 2011

Introduction: Digital Dividend

- The deadline for moving from analogue to digital broadcasting in Nigeria, target date has been brought forward to June 2012 and great efforts to meet it are being made by Broadcasting and Telecommunication Companies. This was against the ITU target of 2015.

Introduction: Digital Dividend

- Nigeria runs one of the most liberalized broadcasting and Telecommunication sectors in Africa.
- Nigeria Government was considering at a time a synergy between the Nigerian Communications Commission (NCC) and the National Broadcasting Commission (NBC).
- For several years, the digital dividend has been a hot issue extensively discussed by broadcasters and operators of telecommunication and other services.

What is the Digital Dividend Spectrum?

- Digital Dividend can be defined as the movement from analogue to digital terrestrial television (DTT) broadcasting, a significant amount of spectrum will become available; spectrum which mobile broadband operators could use to roll out services.

- There are a number of players interested in obtaining a slice of the digital dividend, including terrestrial broadcasters and mobile network operators.

What is the Digital Dividend Spectrum?

- Digital Dividend can also be explained as dealing with coding, compression and modulation techniques for digital terrestrial television broadcasting.

- The digital television systems that allow the Digital compression systems transmission of several (up to six, depending on the coding and modulation techniques) standard digital television channels of acceptable quality in the radio-frequency spectrum previously used by a single analogue channel.

Who gets the Digital Dividend Spectrum

- The range of users to which the digital dividend spectrum can be opened is wide and includes additional terrestrial broadcasting services, mobile multimedia applications, mobile communications, and wireless broadband access systems.

Who gets the Digital Dividend Spectrum

- The Mobile Telecoms Operators who have moved from the voice to data and telecast due to the technology evolution should be allocated spectrum in the digital dividend as they seemed favoured due to the deployment of broadband on their networks.

- The existing mobile phone operators in Nigeria make the best use of the spectrum in the fastest time. This has seriously encouraged competition in the mobile broadband space; In Nigeria having in recent times the landing of about four sub-marine cables (Mainone, Glo1 and Nitel Sat 3) the market has become quite competitive.

Who gets the Digital Dividend Spectrum

- The licensing of digital dividend spectrum can only be done once the migration from analogue to digital television broadcasting is completed.

- Other potential users consider for the dividend spectrum as an opportunity to respond to the growing demand for new wireless communication services are broadband Internet access to areas not yet reached by landlines, thus helping to overcome the digital divide.

Why harmonisation is important in this band – Nigeria, MEA and Worldwide

- Access to and use of radio spectrum has been highly regulated in Nigeria in order to prevent interference among users of adjacent frequencies or from neighbouring geographic areas, particularly for reasons of defence and security.

- In the past decade there have been significant innovations in the theory of spectrum management along with gradual changes in practice of spectrum management and regulation

Why harmonisation is important in this band – Nigeria, MEA and Worldwide

- This gradual change follows a growing consensus that past and current regulatory practices originally intended to promote the public interest have in fact delayed, in some cases, the introduction and growth of a variety of beneficial technologies and services, or increased the cost of the same through an artificial scarcity.

Why harmonisation is important in this band – Nigeria, MEA and Worldwide

- Those factors are making policy-makers and regulators worldwide focus anew on spectrum regulation with an increasing emphasis on striking the best possible balance between the certainty required to ensure stable roll-out of services and flexibility (or light-handed regulation) leading to improvements in cost, services and the use of innovative technologies.

Why harmonisation is important in this band – Nigeria, MEA and Worldwide

- ***Fundamental Management Approach***

  - Regulators have assigned frequencies by issuing licenses to specific users for specific purposes – an administrative approach. The administrative approach can also be more or less prescriptive on the details of spectrum use.

  - Attention has recently been focused on creating genuine markets for spectrum and spectrum licenses under which both the ownership and use of spectrum can change in the course of a licensee's operation.

Fundamental Management Approach

- This is a major step beyond the auctioning of licenses which are not subject to trading and change of use. It does, however, require the full specification of what 'property rights' to spectrum can be traded and utilized.

- Some spectrum, especially for short-range use (Bluetooth, Radio Frequency Identification Device (RFID), microwave ovens, various remote control devices, wireless security systems, etc.) need not be licensed at all.

Fundamental Management Approach

- This might be the case where users do not interfere with one another, or because new technologies can be employed which are capable of dealing with interference as it happens.

- ***Spectrum as a Resource***

- Effective use of spectrum can make a big difference to a country's prosperity, especially where communications are heavily reliant upon wireless technologies such as mobile phones for example, Nigeria.

Digital Dividend on Stakeholders

- Spectrum management has an impact on almost everyone in society, since almost all of us consume or benefit from spectrum-using services.

- These services include marketed ones such as broadcasting or mobile communications, and non-marketed ones, such as national defence. Other firms and public bodies are more directly involved as direct users of spectrum.

Spectrum usage in the UHF band

- The amount of spectrum in the VHF and UHF bands that is above that nominally required to accommodate existing analogue programmes, and that might be thus potentially freed up in the switchover from analogue to digital television, is defined as the digital dividend.
- The digital dividend spectrum is located between 200 MHz and 1 GHz. These frequencies possess superior signal propagation characteristics to those at, for example, 2.4 GHz.
- TV is available through mobile broadband using IPTV, therefore with spectrum being used for this the broadcasters could potentially continue to add value through content, however the increased availability and usage demand of IPTV would thereby free up 400MHz-1GHz.

Spectrum usage in the UHF band

- Countries that wish to implement mobile services in the band 790–862 MHz are required to protect broadcasting services against harmful interference. Also, before putting mobile services into operation, agreements from neighbouring countries must be obtained.

- These ITU allocations open up the possibility (but not the obligation) of choosing for the digital dividend up to 72 MHz of spectrum (18 per cent of the UHF television band) currently allocated to the broadcasting service.

Spectrum usage in the UHF band

- Furthermore, WRC-07 identified the UHF frequencies allocated to the mobile service on a primary basis in all three ITU regions for use by administrations wishing to implement International Mobile Telecommunications (IMT). This can be considered as a signal to industry to develop equipment for worldwide use.

Spectrum usage in the UHF band

- However, recognizing the potential for interference between the mobile service and other primary services in the band 790–862 MHz, WRC-07 decided that ITU would conduct technical studies on sharing among the mobile and other allocated services.

- The results of these studies will be reported to the World Radio Communication Conference 2012 (WRC-12) under Agenda item 1.17, in order to ensure the adequate protection of services to which this frequency band is allocated, and take appropriate action.

Conclusion

- If the digital dividend is to be utilized by mobile services, worldwide (or at least region-wide) frequency harmonization is a required condition. Such harmonization would create enormous benefits in terms of social impact and increased productivity. In particular, mobile operators and equipment manufacturers would be able to address a large market, leading to economies of scale and preventing high costs for handsets.

Conclusion

- The possibility of harmonization depends primarily upon the timing and co-ordination of the analogue to digital switchover process; the digital dividend spectrum will be fully available only after analogue switch-off.

- In this respect, the GE06 Agreement (adopted in Geneva at the ITU Regional Radio Communication Conference 2006) calls for the transition to be completed by 17 June 2015 for the countries in Region 1 (except Mongolia) and the Islamic Republic of Iran. In Europe, many countries will close down their analogue television transmissions by 2012.

Conclusion

- Some countries have made their plans for the analogue switch-off, while others are only considering this possibility. Another constraint is that broadcasting channels are scattered on a non-contiguous basis across the whole UHF band.

- Though digital terrestrial television services have been introduced in some countries, they are based on different standards (DVB-T, ATSC, ISDB-T, DMB-T), all using a different channel raster.

THANK YOU

Engr. Gbenga Adebayo

Chairman, Association of Licensed Telecommunications Operators of Nigeria (ALTON)

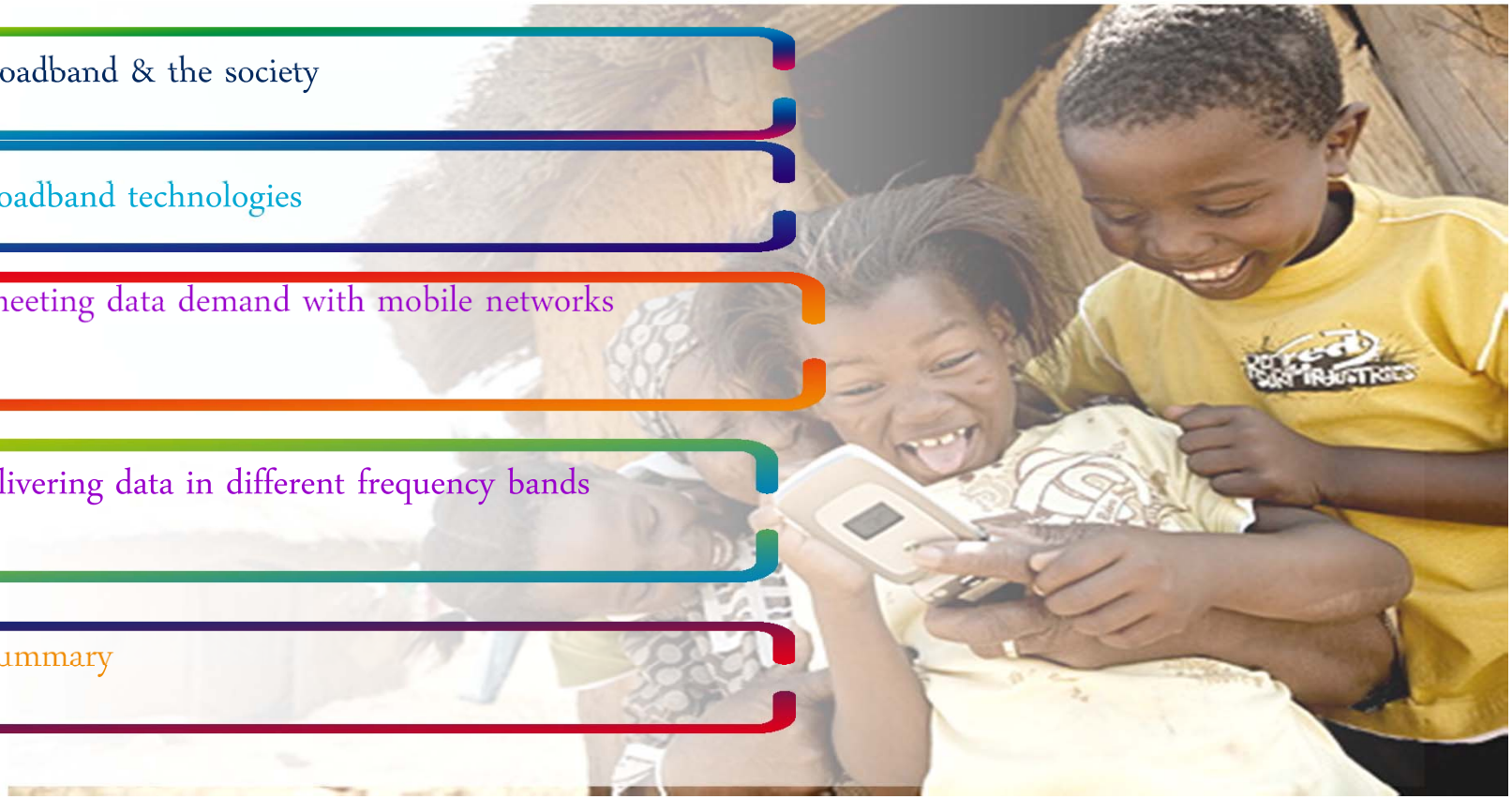


Network delivery of mobile broadband for nigeria

Adedeji Adedamola
LM ERICSSON, NIG.

Agenda

- Broadband & the society
- Broadband technologies
- meeting data demand with mobile networks
- Delivering data in different frequency bands
- summary



Broadband benefits the society



Universal need for services & efficiency gain

Agenda

- Broadband & the society
- Broadband technologies
- Delivering data in different frequency bands
- Meeting data demand with MObile networks
- summary



Broadband comes in many flavors

Fixed access

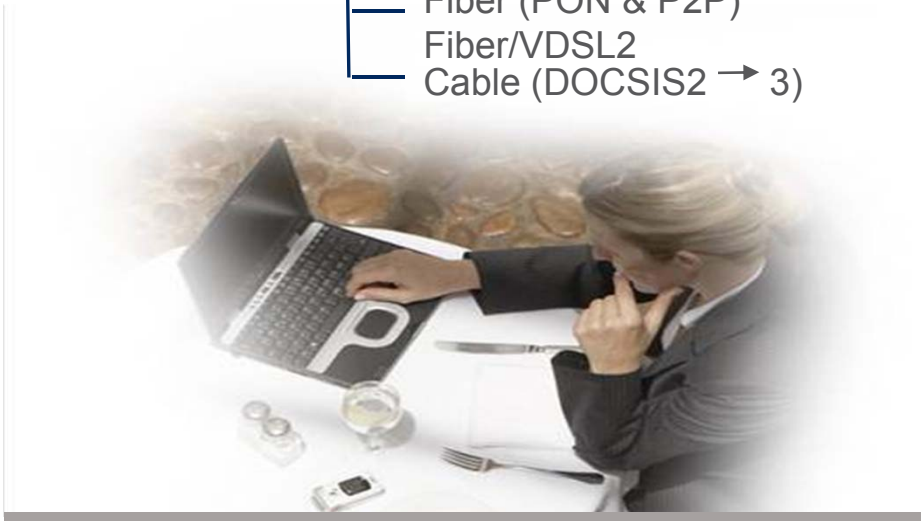
- xDSL
- Fiber (PON & P2P)
- Fiber/VDSL2
- Cable (DOCSIS2 → 3)

Fixed/nomadic wireless

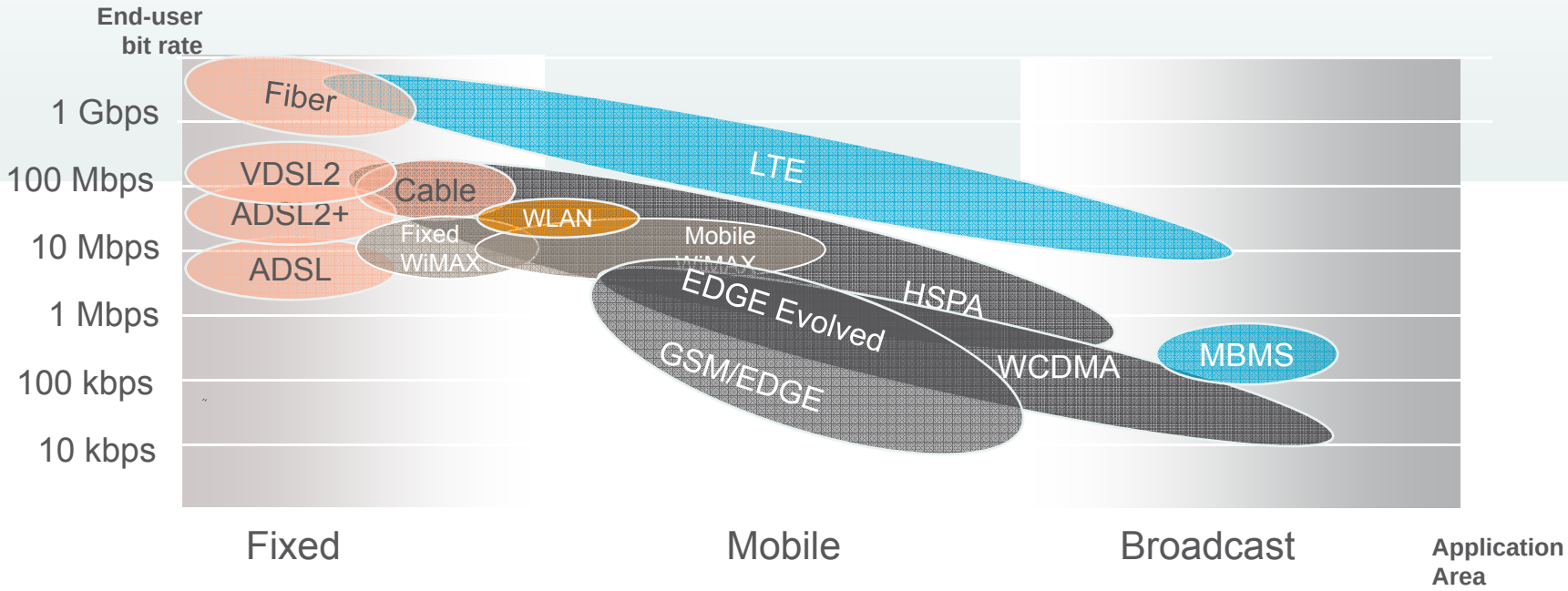
- WiMAX
- ”Fixed Mobile
- HSPA/LTE”
- Satellite/Terrestrial
- Unlicensed (WiFi, etc)
- Others

Mobile access

- GSM/EDGE
- WCDMA/HSPA
- LTE
- CDMA2000 EVDO
- Mobile WiMAX

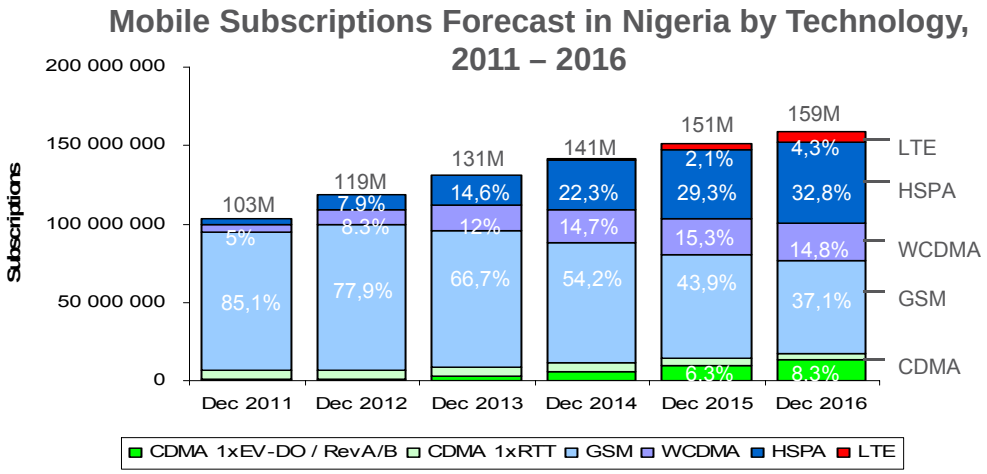


Access Technology Overview

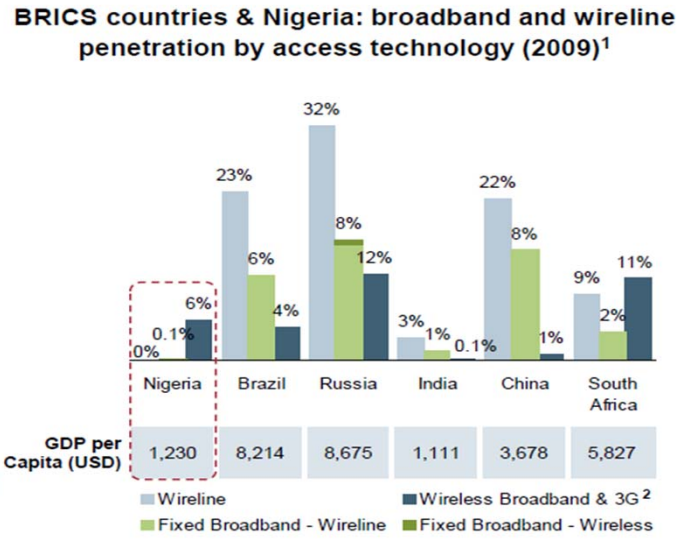


Note: EDGE evolved will be available from 2008
Note: HSPA includes both HSPA and HSPA- Evolved
Note: LTE final specification of the standard is expected in 2007
Note: "Dedicated" means "Dedicated Mobile Broadcast" includes a number of technologies

Mobile Broadband Forecast in nigeria



Data Technology	Dec 2011	Dec 2012	Dec 2013	Dec 2014	Dec 2015	Dec 2016
LTE	0	0	214 000	1 402 000	3 139 000	6 804 000
HSPA	3 885 000	9 445 000	19 075 000	31 597 000	44 237 000	52 192 000
WCDMA	5 165 000	9 871 000	15 784 000	20 767 000	23 081 000	23 459 000
CDMA 1xEV-DO / RevA/B	730 000	1 323 000	2 774 000	5 663 000	9 539 000	13 248 000
Total MBB Subscribers	**9 780 000**	**20 639 000**	**37 847 000**	**59 429 000**	**79 996 000**	**95 703 000**

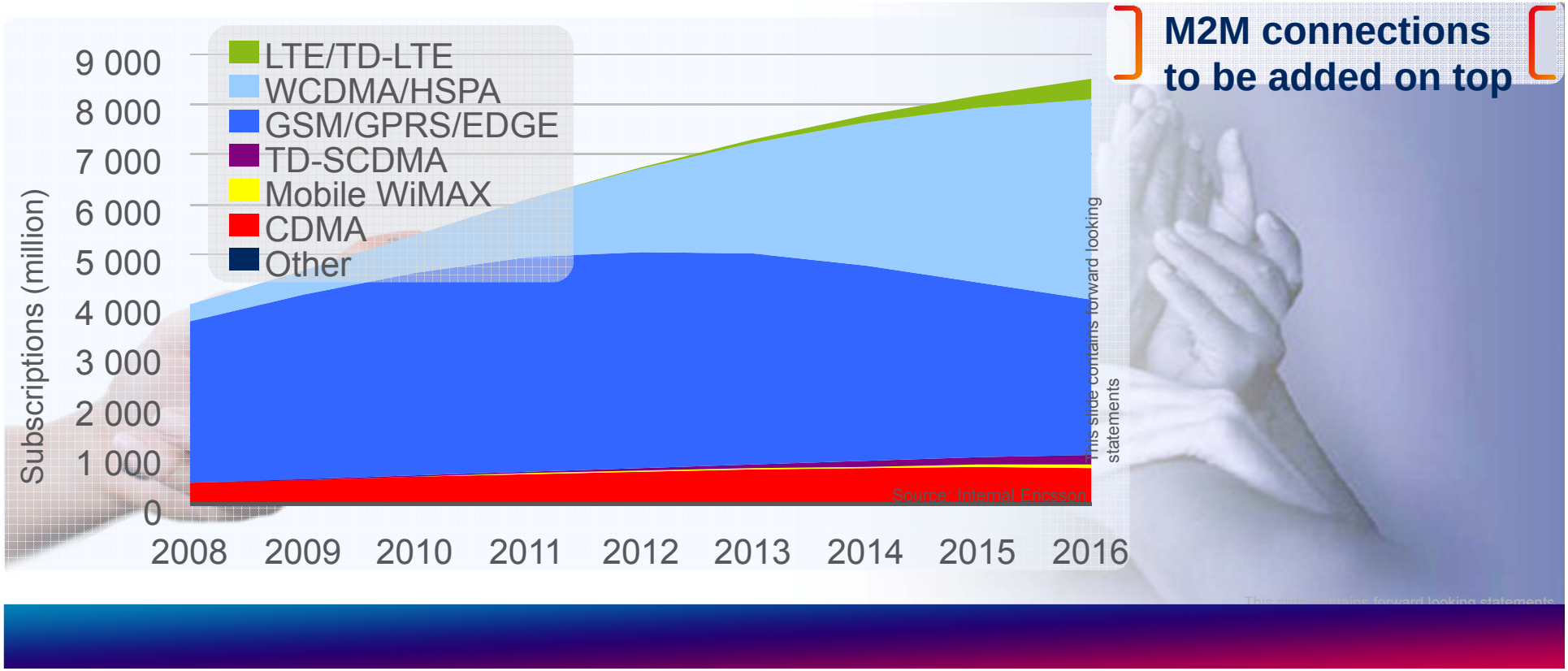


Source: Analysys Mason

58% CAGR over 2011-2016

Source: informa, WCIS: World Cellular Data Metrics; Jun 2011 & Ericsson Analysis

GSM/HSPA/LTE Subscriber Uptake tops



Agenda

- Broadband & the society
- Broadband technologies
- meeting data demand with mobile networks
- Meeting data demand with MObile networks
- summary



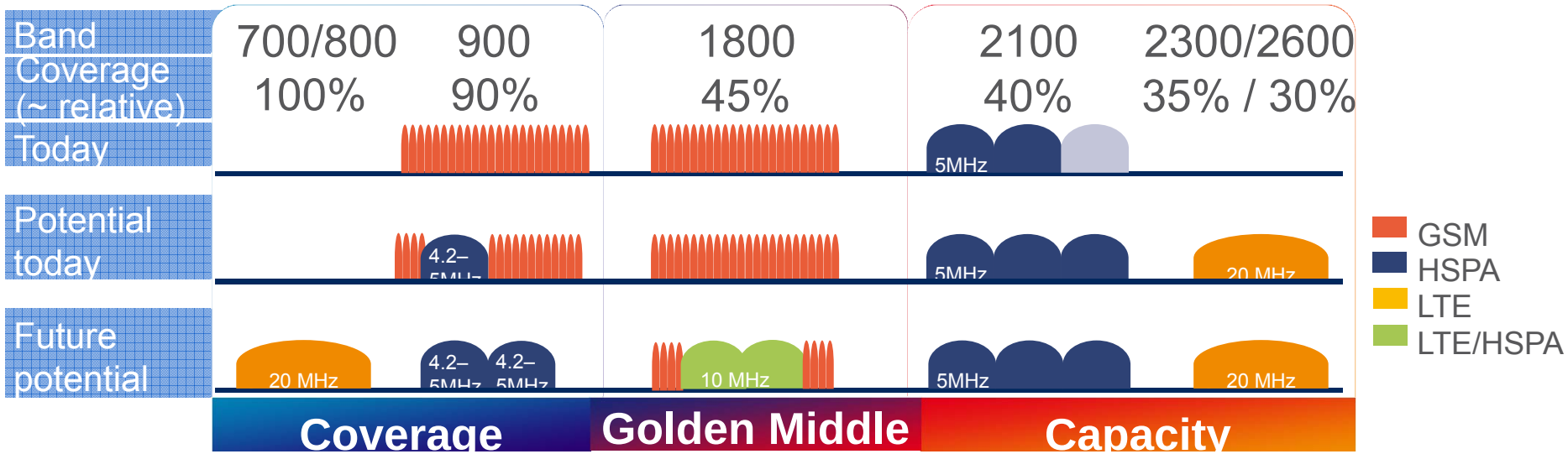
Network efficiency

- Coverage, Capacity & quality

› All MNO assets needs to be fully utilized

– Spectrum

– Site and infrastructure



Getting THE NETWORK ready for MOBILE BROADBAND



1 EDGE & HSPA expansion and evolution

2 Mobile Transport evolution

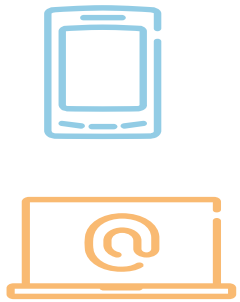
3 Packet core evolution

4 QoS differentiation

5 Smart charging

6 LTE introduction

Mobile broadband capacity



Radio

Coverage and capacity plan

Spectrum plan

Multi-Standard

Alternative power

Backhaul

Ethernet

Fiber

Microwave

Core

Flat IP

EPC functionality

High capacity nodes

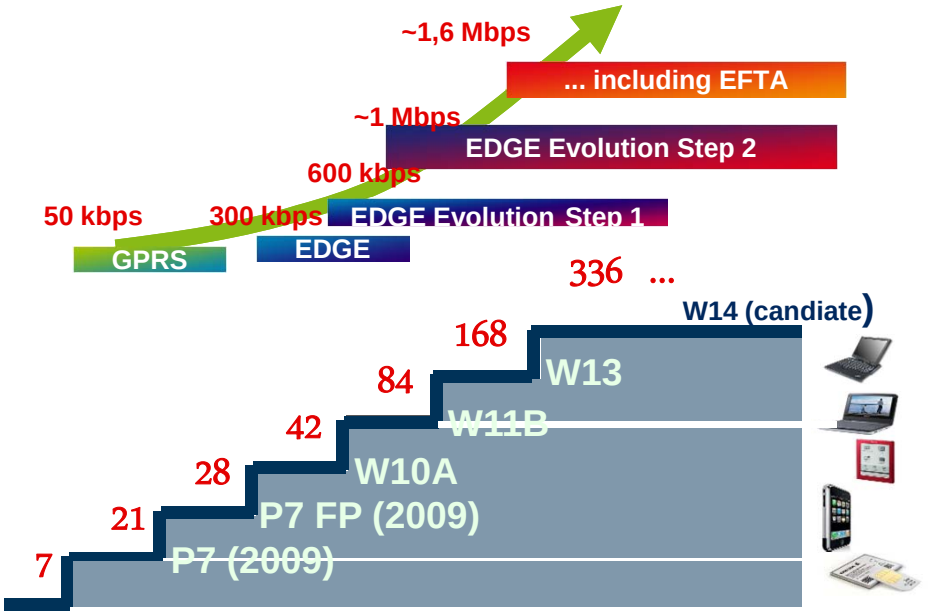
Traffic Mgmt.

[Mobile Broadband in one network]

DEPLOY SW Features that increase MBB availability

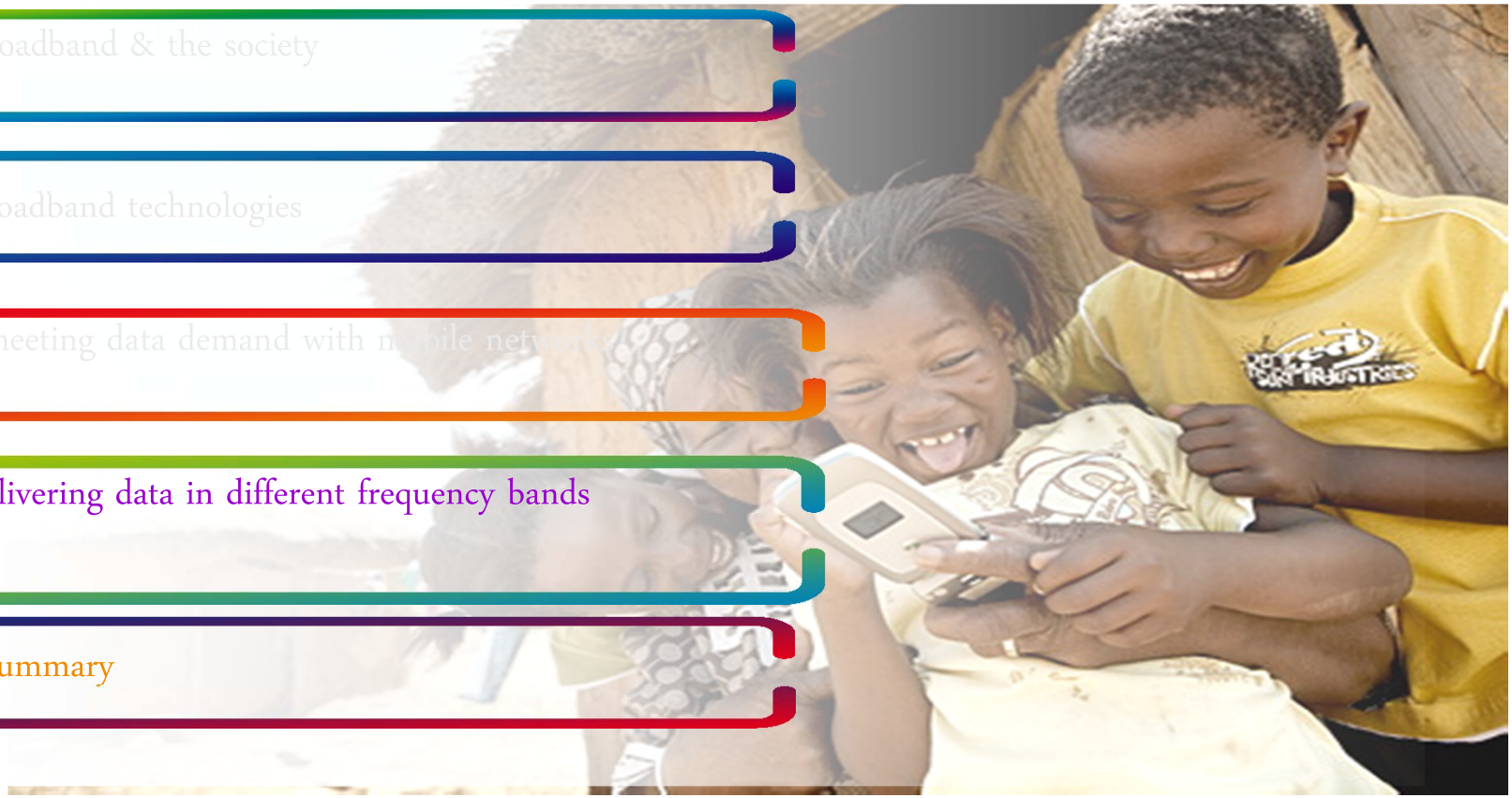
- Increase Voice & MBB capability using same infrastructure E.g. VAMOS
- Edge Evolution to complement HSPA+ and LTE
- Evolve WCDMA networks to HSPA/HSPA+
- QoS should be addressed End-to-End





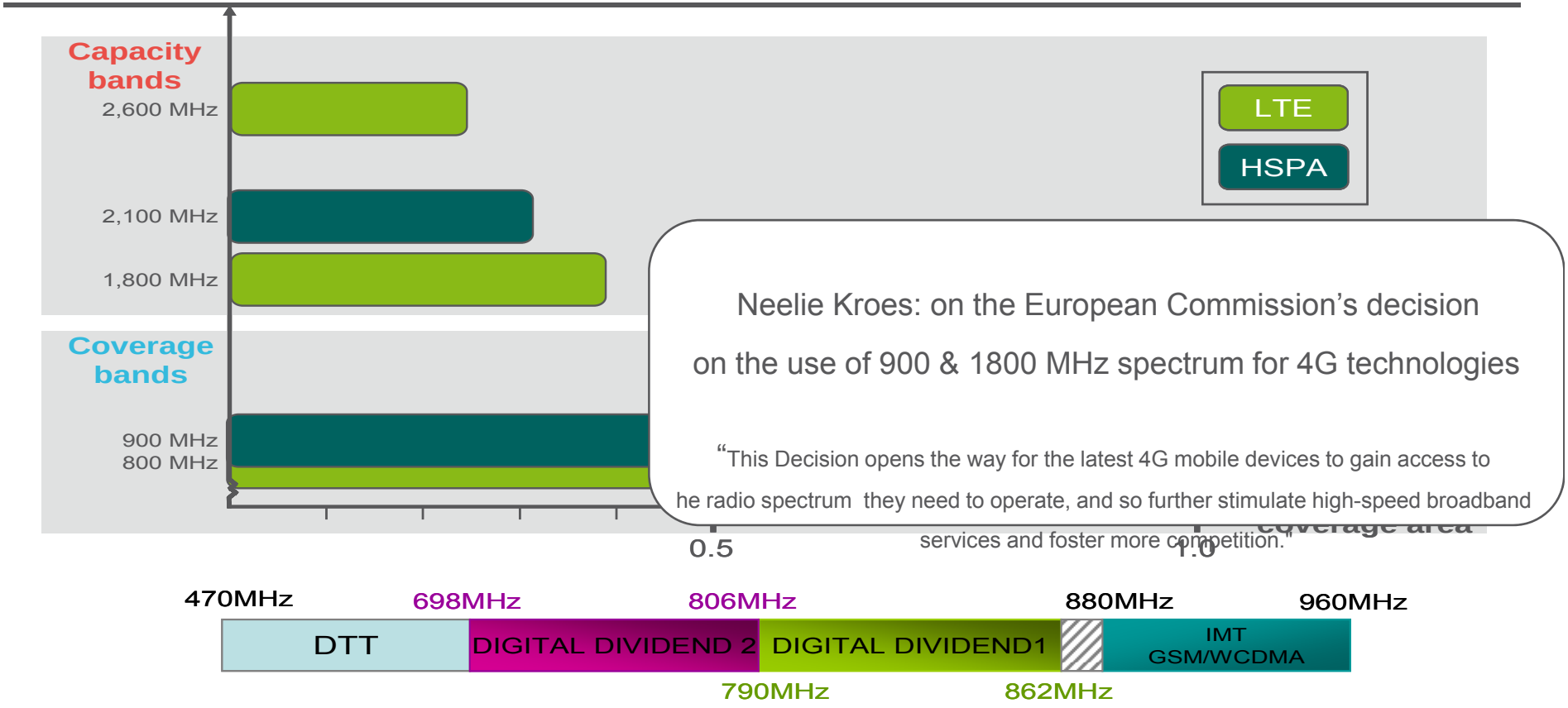
Agenda

- Broadband & the society
- rBoadband technologies
- meeting data demand with mobile networks
- Delivering data in different frequency bands
- summary



BROADBAND capacity & COVERAGE

- Typical deployments in EMEA



Neelie Kroes: on the European Commission's decision on the use of 900 & 1800 MHz spectrum for 4G technologies

"This Decision opens the way for the latest 4G mobile devices to gain access to he radio spectrum they need to operate, and so further stimulate high-speed broadband services and foster more competition."

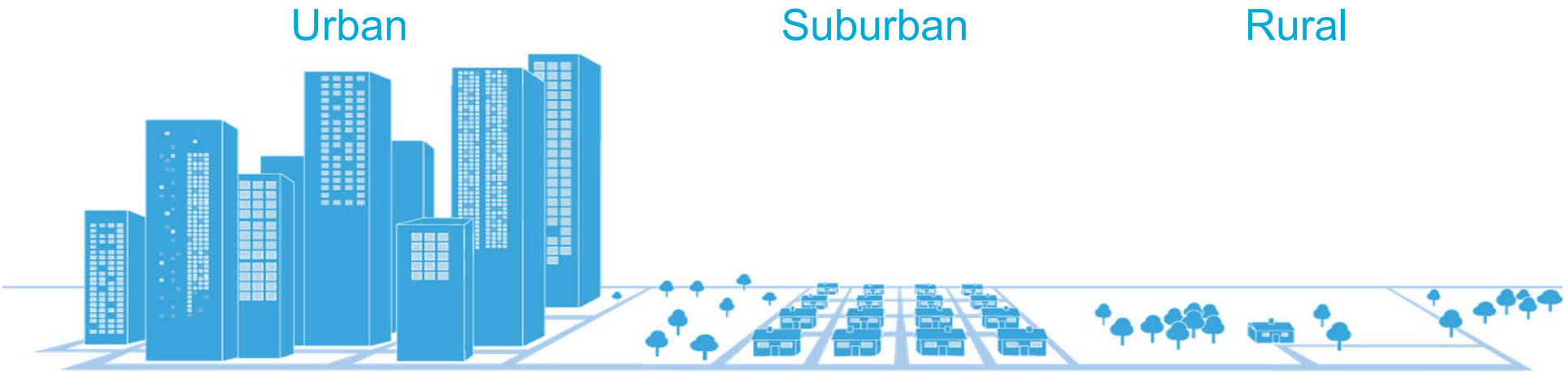
WCDMA 900 VS 2100 Coverage

- Radio planning W900 vs. W2100
- Link budget ~6dB better
  - 900 MHz frequency gain +8.2dB
  - Assume same antenna size: 900 MHz antenna plus feeder loss -2dB
  - Σ ~ 6dB better link budget in WCDMA 900
- Radio planning W900
  - Link budget ~6dB better
    - Better output power and receiver sensitivity
- Capacity & Coverage planning
  - Infrastructure reduction strategy



30-50% fewer sites with WCDMA 900 compared with WCDMA 2100

TYPICAL SPECTRUM STRATEGY



summary

- MBB is a reality and benefits Individuals, Enterprises and Government.
- Mobile Networks Operators need to have a cost effective way of delivering data to subscribers
  - Modernization
  - SW feature Evolution
- Regulators and Government and other stakeholders can encourage MBB delivery to all by releasing required spectrum for capacity and coverage.



ERICSSON



GSMA Broadband Workshop, Lagos, September 2011

Building Capacity: Working Towards WRC-15

Ross Bateson, Special Adviser, Government Affairs

GSM Association

Background

- A significant part of the GSMA's work with spectrum takes place in Geneva and the ITU
- Work revolves around World Radiocommunication Conferences, held every four years or so
- Next two WRCs: 2012 and 2015 will dictate access to capacity
- Process is long, tiring and painful. . .

- . . . but results define the way we use mobile telephony

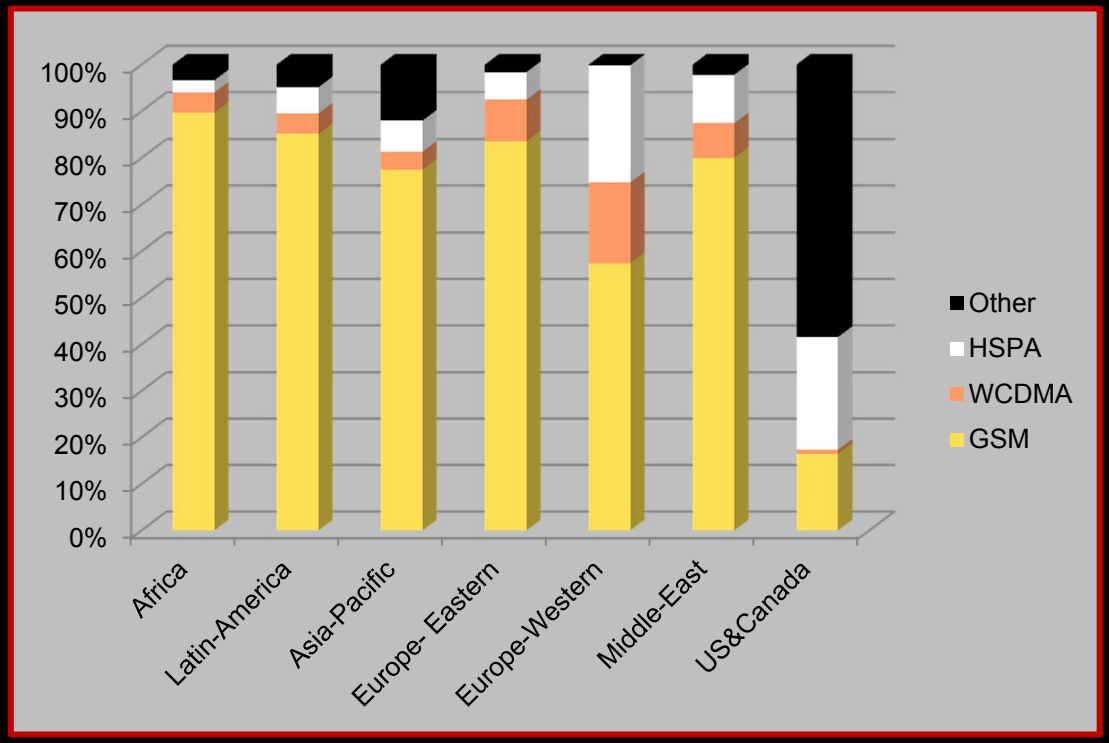


© GSMA 2011

What's the Problem?

© GSM Association 2011

Capacity: African Expansion



- Pressure on spectrum in North America and Europe is already intense
- Massive growth of mobile broadband anticipated in Africa. . .
- . . . is matched with intense difficulties in base station roll-out
- Access to new spectrum will prove critical to network quality, new services and bottom-line growth

© GSM Association 2011

Issues

2012 – 2015 = 2020-2030

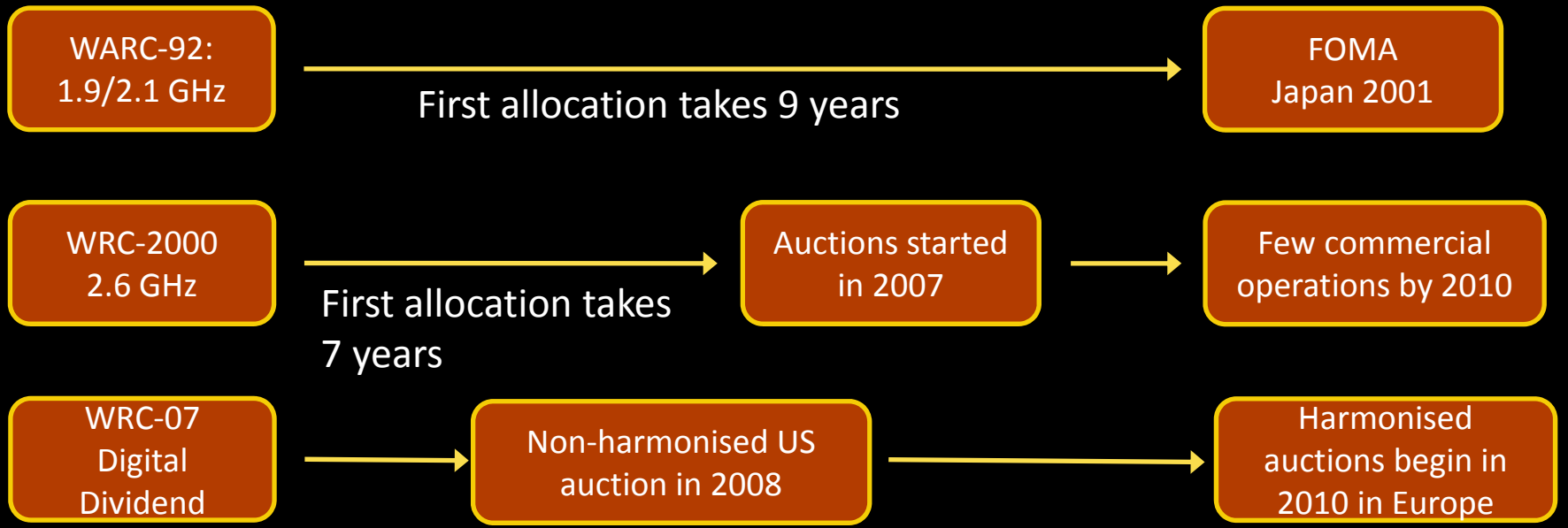
- Countries have the opportunity to identify new spectrum at the ITU for IMT/mobile broadband: but the lead time is huge…
- A new “AI” needs placing on the agenda of WRC-15 through significant outreach at WRC-12
- 2012-2015 will be a key period of negotiation between Administrations and Industries
- The IMT Agenda Item at WRC 15 MAY identify new spectrum
- . . . but typically operators then face a 10 year wait until it is allocated



© GSMA 2011

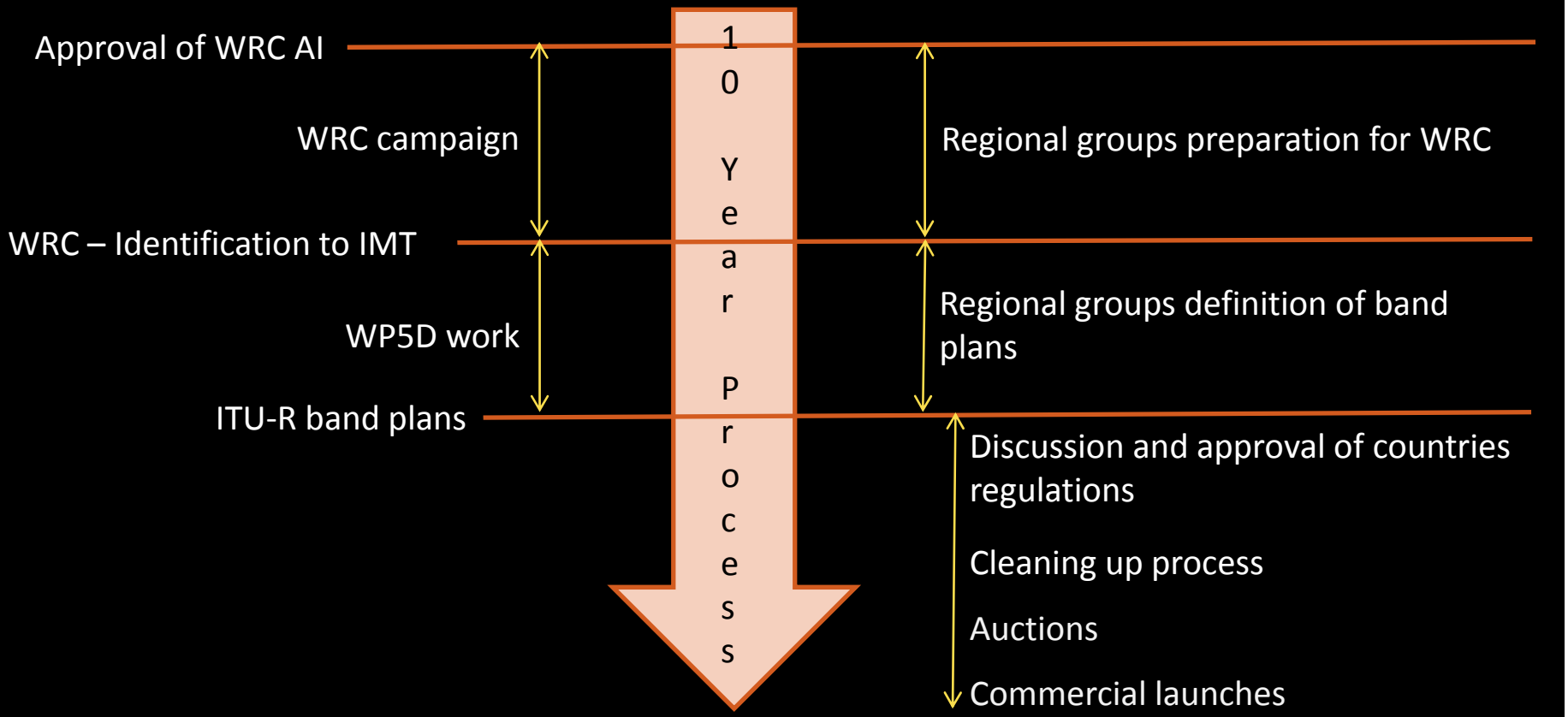
Process

- Typically it takes about 10 years between ITU identification and commencement of service



© GSM Association 2011

Process: ITU, Regional Groups and Countries



© GSM Association 2011

Why Wait for the ITU?

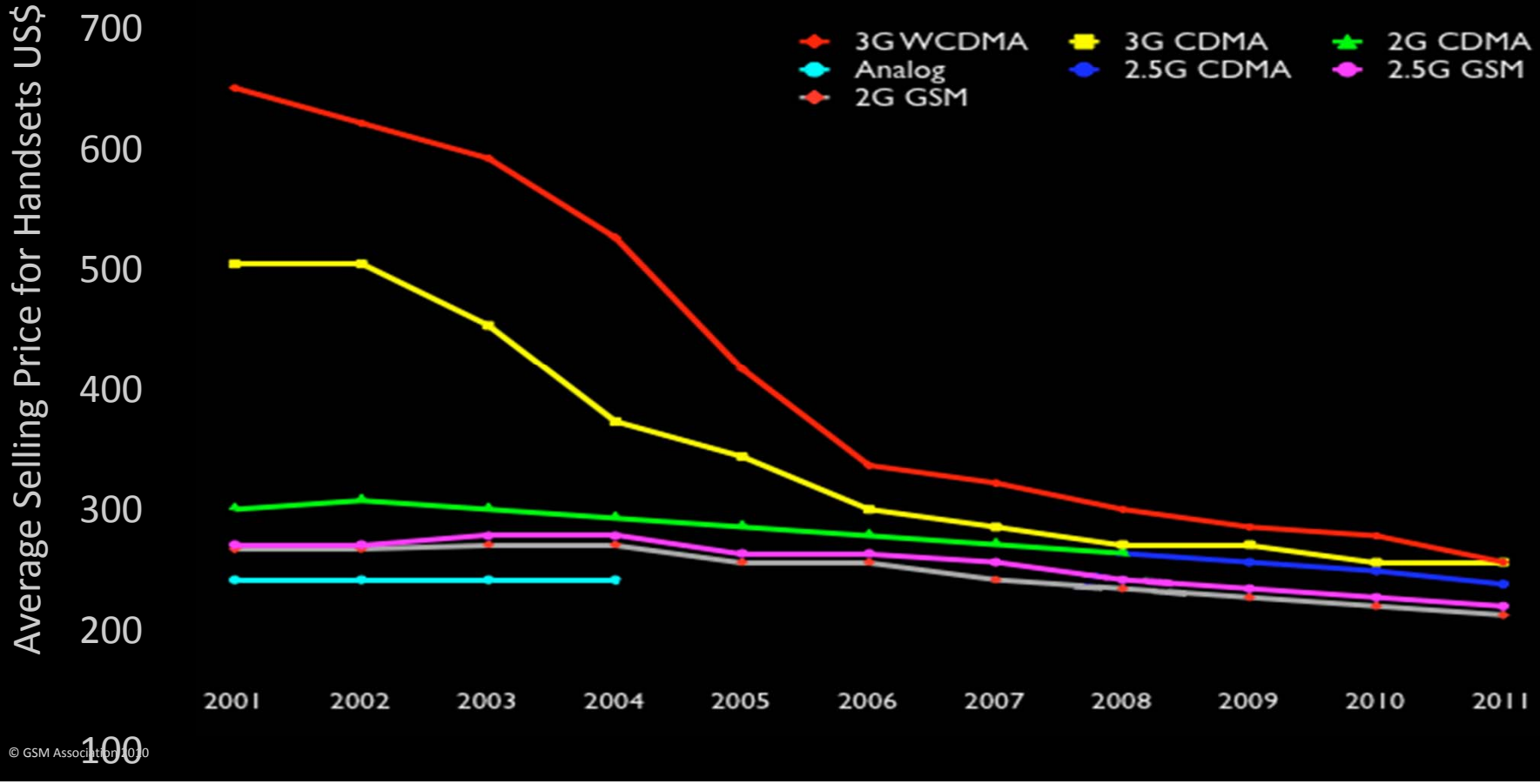
© GSM Association 2011

IMT Identification Drives Harmonisation

- IMT Identification at the ITU is vital to driving development
- The global identification to IMT gives manufacturers confidence to spend millions developing products
- The ITU identification gives confidence to all parties and creates a global market place ensuring massive economies of scale
  - Mobile operators get cheaper base stations
  - Consumers get cheaper handsets
  - More people can afford mobile telephony

© GSM Association 2011

Scale Matters.....



© GSM Association 2010

What's the Story so Far?

© GSM Association 2011

Growing Global Support

- Inter American proposal agreed at CITEL: *“PCC-II proposes that the ITU-R undertake studies to determine the spectrum requirements to support IMT and other mobile broadband application.”*
- African Common Proposal asks for AI: *"To consider the spectrum requirements for the development of terrestrial mobile broadband services and based on the outcome of the ITU_R Studies, to be completed in time for WRC-15, take necessary regulatory and technical actions, including possible additional allocations to the mobile service on a primary basis and identification of bands for IMT“*
- Strong support for an Agenda Item in Europe
- APT Common Proposal seeks new Agenda Item to plan IMT spectrum

© GSM Association 2011

Nigeria's Leading Role

- Nigeria has been one of the most vocal supporters of the new Agenda Item to find mobile spectrum
- The government has made telling and critical interventions to ensure common positions in Africa
- Continued support will be crucial going into the WRC process



AFRICAN COMMON PROPOSALS TO THE WORLD RADIOCOMMUNICATION CONFERENCE 2012 (WRC-2012)

African Telecommunications Union (ATU)

Document –
/07/2011
Original – English

Proposal from Nigeria

Agenda Item 8.2 for WRC-12 and IMT

Input to the 2nd Meeting of the African Group Preparatory meeting for WRC-12

Algiers – July 2011

© GSM Association 2011

Significant Resistance

- The benefits of mobile broadband and the need for more spectrum is universally recognised
- However, no airwaves are free of use, and the place we inhabit is the busy spot
- Other industries are lobbying hard to carve their services out of an Agenda Item

- . . . If every service is carved out, **no new spectrum for mobile is possible**



SOLUTION: KEEP OPTIONS OPEN – TASK THE CORRECT ITU WORKING PARTY (WP5D) TO ADVISE ON SPECTRUM AHEAD OF WRC-15

© GSM Association 2011

Next Steps: Your Involvement

Before WRC

- Reach out through your sister companies to all administrations
- Ensure support for new Agenda Item is maximised
- Engage with all administrations in your company's footprint

During WRC

- WRC begins January 2012
- The GSMA will have a strong presence at WRC
  - Significant lobbying effort
  - Stand displaying technology possibilities
- Industry participation on National delegations will be hugely supportive

After WRC

- WRC ends February 17…
- …work begins February 20 at "CPM-1": crucial decisions made
- Continued support from the MNO you work for will be crucial
  - National level
  - ITU Working Groups
  - ATU, ECOWAS and other regional grouops

© GSM Association 2011

Conclusion

- New spectrum will be vital to the future growth of mobile broadband
- Strong signals from Administrations via a WRC IMT Identification are required to provide the stimulus for industry to commit to development costs
- We must keep an open mind: spectrum planning must take place 2012-2015
- Planning for the decade 2020-2030 begins here with:
  - a new AI for IMT at WRC-15
  - placed on the Agenda by WRC-12 under AI 8.2
  - WP5D should carry out the work between the two WRCs

© GSM Association 2011



Keep In Touch! - rbateson@gsm.org

Restricted - Confidential Information
© GSMA 2011
All GSMA meetings are conducted in full compliance with the GSMA's anti-trust compliance policy



Strategic Initiatives - *Overview Presentation*

Restricted - Confidential Information
© GSM Association 2011
All GSMA meetings are conducted in full compliance with the GSMA's anti-trust compliance policy

1.5 Billion Fixed Lines
Over 5 Billion Mobile Connections

Mobile Is Connecting The World



The Power of Mobile



Three quarters of mobile phone users will not leave home without their device

Nearly half go to bed with their phone nearby

There will be more smartphones in the world than PCs by 2013

Half a billion people accessed the mobile Internet worldwide in 2009: Usage expected to double within five years

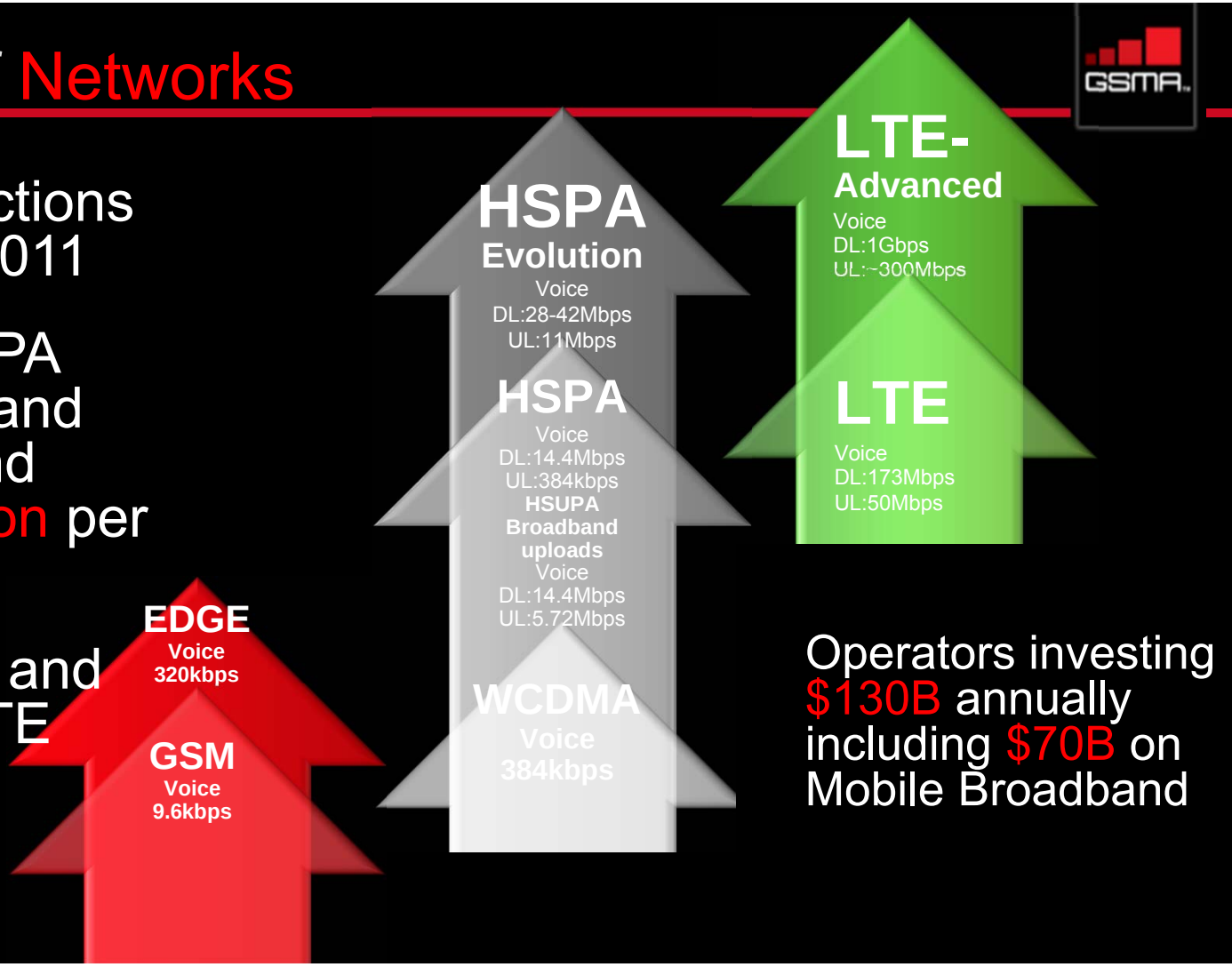
© GSM Association 2011

The Power of Networks

6 billion connections by the end of 2011

500 million HSPA Mobile Broadband connections and adding 19 million per month

21 commercial and 206 planned LTE networks



Operators investing $130B annually including $70B on Mobile Broadband

© GSM Association 2011

The Power of Devices



Apple iOS



Android



RIM



Windows Phone 7



HP Palm OS



MeeGo

~100 million smartphones shipped in Q1 2011 (27%)

50% of Americans will have smartphones by the end of 2011

© GSM Association 2011

Source: IDC

Three Waves of Mobile



The first wave of mobile was connecting people

The strength of mobile was its ubiquity, underpinned by its global interoperability



The second wave of mobile is connecting the world's population to the Internet

The strength of mobile was the exponentially increasing power of its networks



The third wave of mobile is connecting everything in our lives

The strength of mobile is its ubiquity, its interoperability and the increasing power of its networks

© GSM Association 2011

The Connected Life!

The world's mobile operators are enabling the Connected Life

Only the world's mobile operators, with their global scale and focus on interoperability, can build the ecosystems to deliver this Connected Life for the benefit of business and consumers

Key elements of the Connected Life



Delivering the Connectivity:
Mobile Broadband and Spectrum



Connected Things:
Embedded Mobile



Connected Transactions:
Mobile NFC



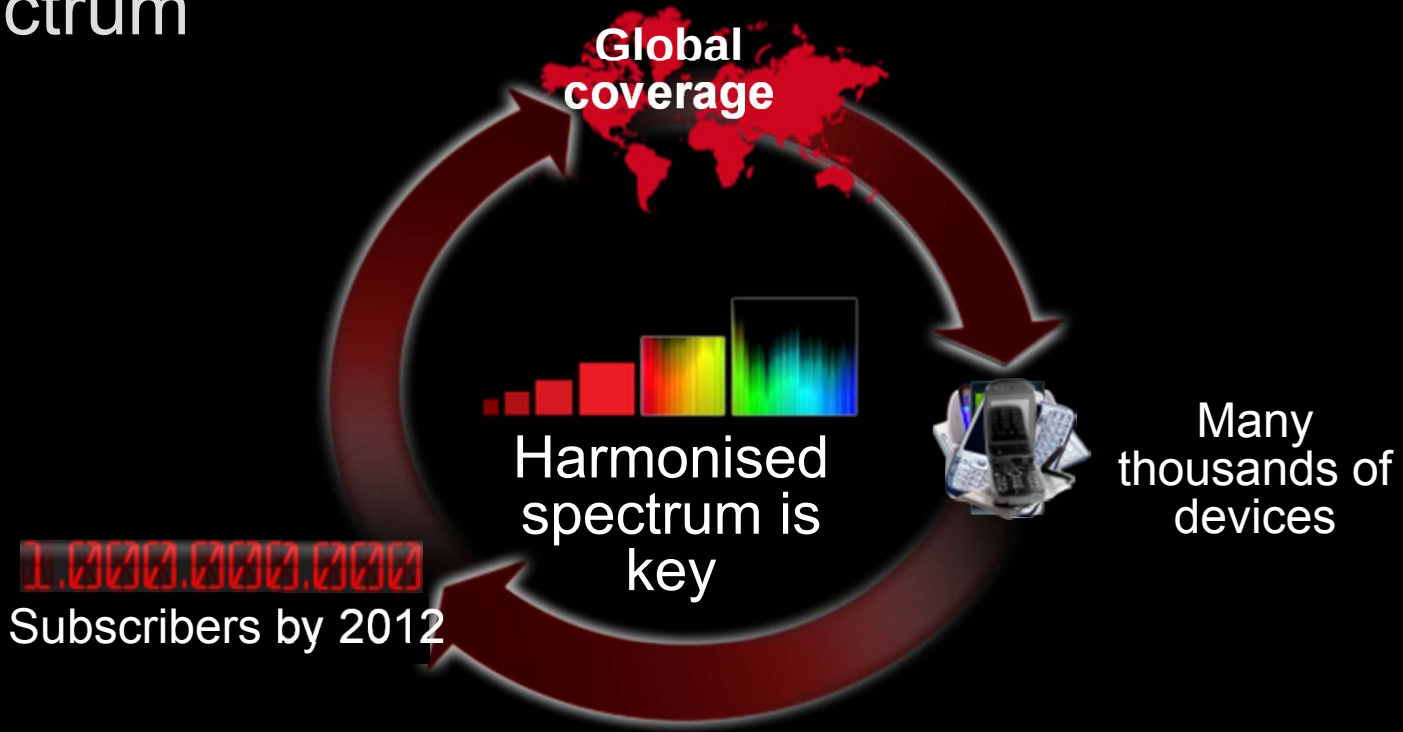
Connected Marketing:
Mobile Advertising



Connected Communications:
Rich Communications Ecosystem

© GSM Association 2011

Delivering Connectivity: Mobile Broadband & Spectrum



GSMA estimates a spectrum shortfall of 900MHz by 2025

10% increase in mobile penetration drives a 1.2% increase in GDP

© GSM Association 2011

Connected Things: Embedded Mobile

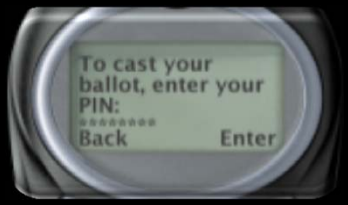
Consumer Electronics



Healthcare



Government



Automotive



Utilities



We will move from over 5 billion connections today to over 15 billion connected things by 2020

Devices from many verticals will be made more compelling by the addition of mobile connectivity

The Embedded SIM will allow for remote management of operator credentials while retaining the 'physical entity' to ensure maximum security

The Embedded SIM will accelerate this market and feature in devices from 2012

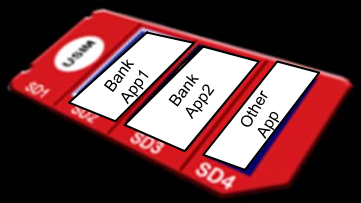
© GSM Association 2011

Connected Transactions: Mobile NFC



NFC Technology

+



Secure Element

=



Mobile NFC

NFC technology will enable a contactless world for payments, ticketing, couponing, loyalty, information and transactional services

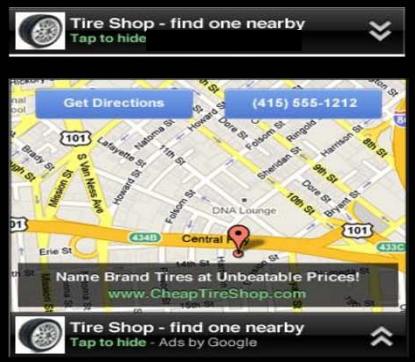
The total payment value for NFC globally will reach over €110 billion in 2015

Differing approaches to NFC will fragment the market

Mobile operators are driving a standardised deployment of mobile NFC using the SIM as the secure element to provide authentication, security and portability

© GSM Association 2011

Connected Marketing: Mobile Advertising







The market for mobile advertising is ~ $3.1 billion and is expected to rise to $11 billion by 2015

For traditional and Internet media, audience measurement is commonplace

As the market for mobile advertising develops, the media industry is demanding an independent & robust approach to audience measurement

Mobile Media Metrics (MMM) delivers anonymised, census-level data for mobile Internet usage across mobile networks

This service is currently live in the UK

© GSM Association 2011

Connected Communications: RCE

Rich Communication Suite-enhanced (RCS-e) delivers multimedia communications services from the phone's contact list

Allows consumers to be introduced to new services quickly and intuitively

Enables seamless interaction with friends that have same capabilities

New spec aims to speed up the market introduction and adoption of these services

Key mobile operators expect to launch services in 2011 across European markets



© GSM Association 2011

Creating the Connected Life!



NFC



Rich Communications





Mobile Advertising



Embedded Mobile

Creating compelling, secure & interoperable services

© GSM Association 2011



Restricted - Confidential Information
© GSM Association 2011
All GSMA meetings are conducted in full compliance with the GSMA's anti-trust compliance policy