



DIGITAL DIVIDEND

THE OPPORTUNITIES TO ACHIEVE BROADBAND FOR ALL

Rizwan Hassan

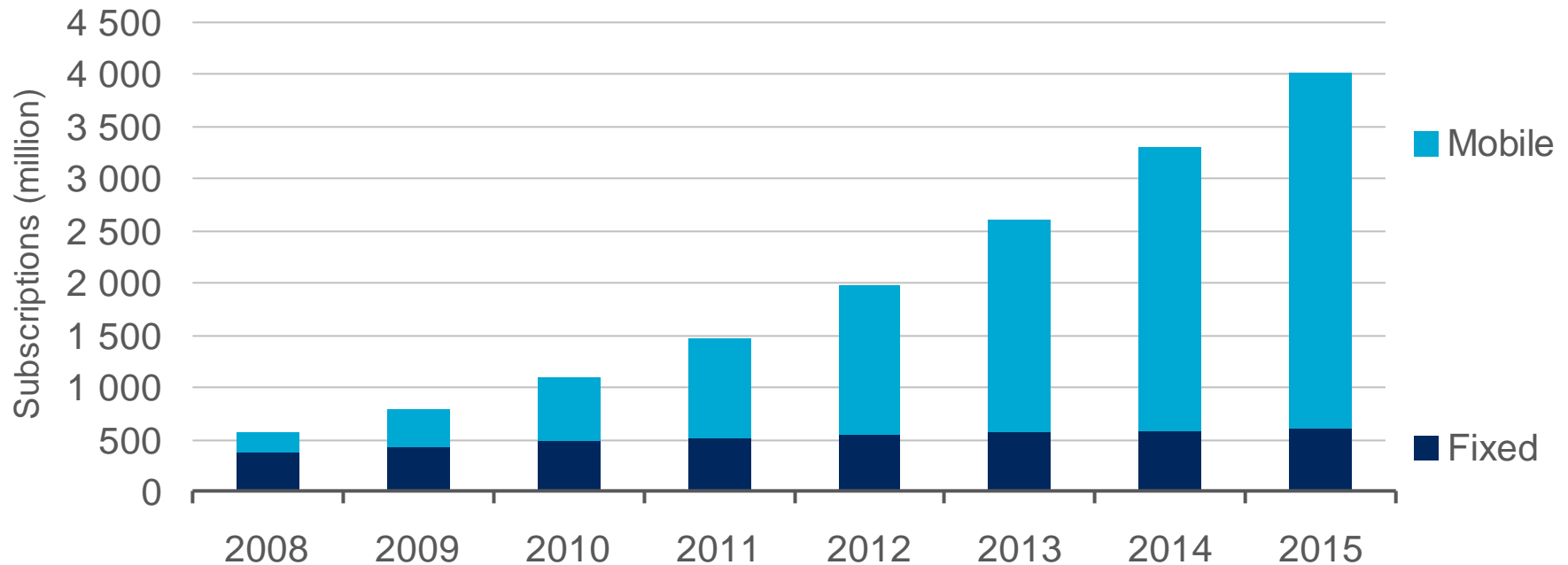
Head of Radio Business, Ericsson North Africa.

BROADBAND BENEFITS SOCIETY



BROADBAND SUBSCRIPTIONS – MOBILE REDEFINES THE MARKET

Fixed and mobile broadband subscriptions



Source: Internal Ericsson

Mobile Broadband includes: CDMA2000 EV-DO, HSPA, LTE, Mobile WiMAX & TDSCDMA.

It includes handsets, USB dongles, embedded modules etc. The vast majority is handsets.

Please note that mobile broadband access could be used for fixed applications

Fixed broadband includes DSL, Cable and Fiber

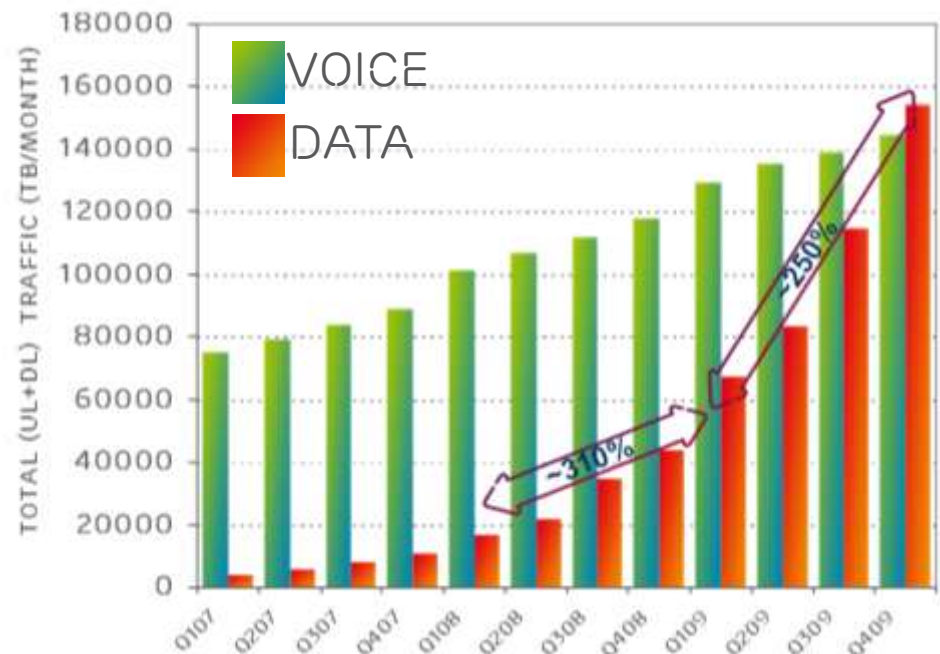
This slide contains forward looking statements

STRONG GROWTH IN MOBILE BROADBAND - MEASURED

Rapid subscriber uptake

- › **515 million** WCDMA/HSPA subscribers
- › 10 million new HSPA subscribers per month, 220 million in total
- › **2137 HSPA devices** are launched from 214 suppliers
- › HSPA is deployed in 315 networks in 133 countries/ territories
- › **41 HSPA+ networks** launched
- › **91%** of the traffic in WCDMA/HSPA networks **is data**

Exceptional traffic growth

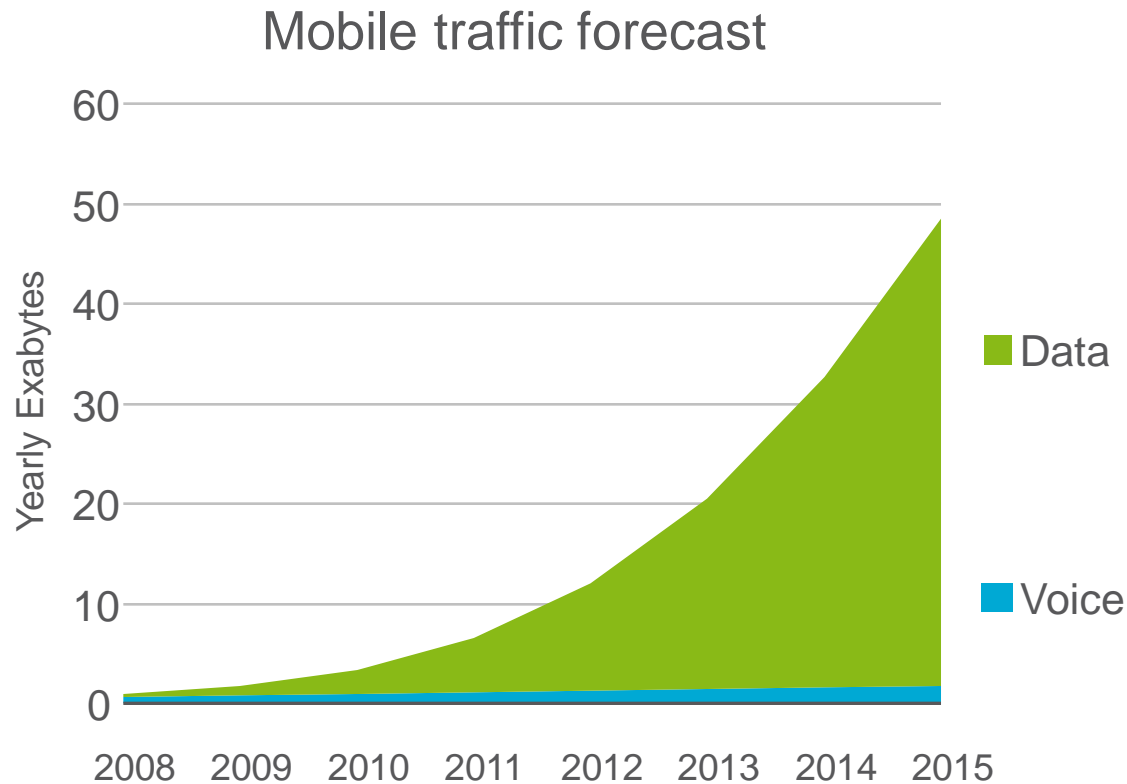


Source: UMTS, GSA and Ericsson NetQB, March-2010

LTE WILL ACCELERATE THIS TREND FURTHER – MORE SPECTRUM NEEDED!

TRAFFIC GROWTH IN MOBILE NETWORKS - FORECAST

This slide contains forward looking statements

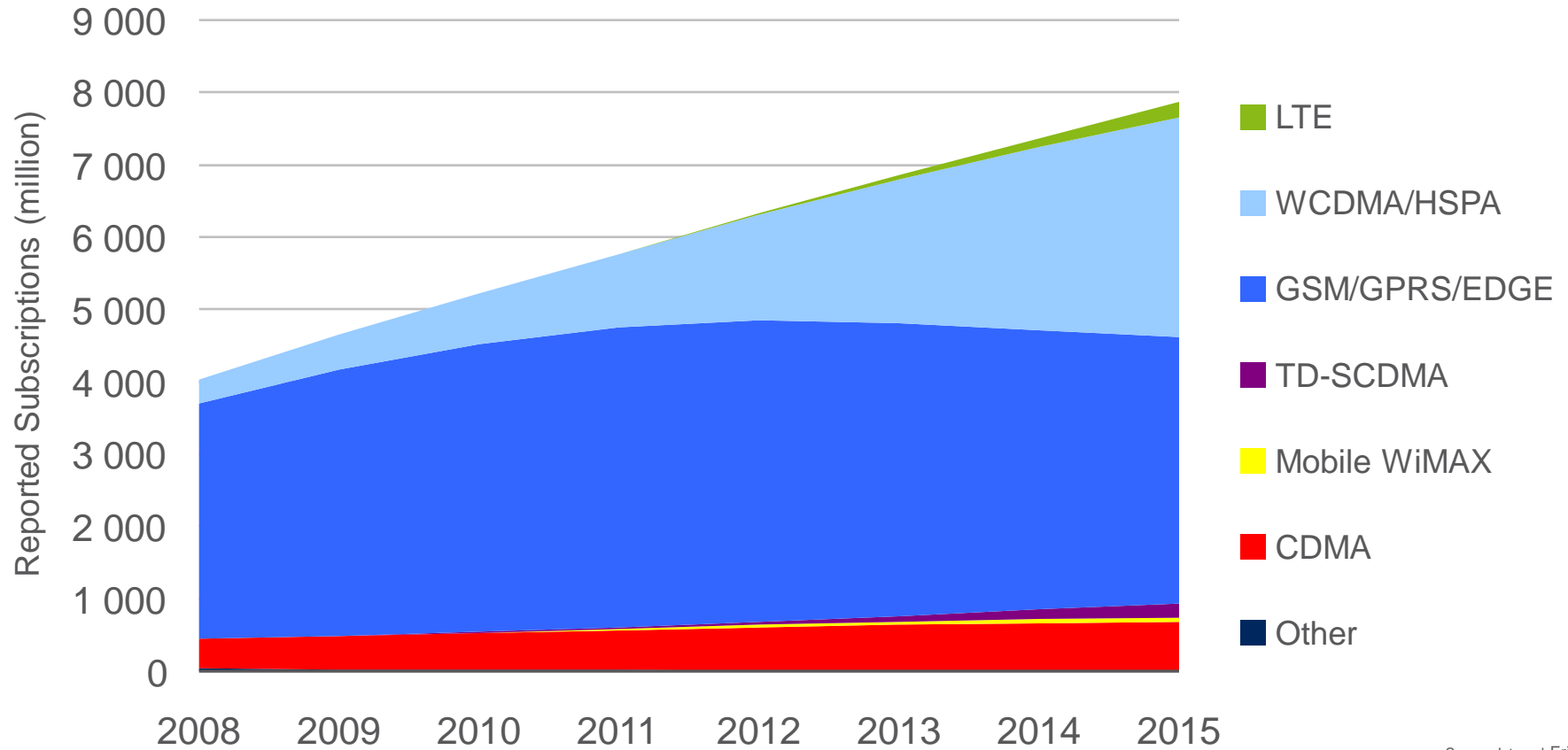


Source: Ericsson

BEHAVIOR AS IN FIXED – HIGH DEFINITION VIDEO STREAMS – 50 B. DEVICES 2020

THE 3GPP SET OF INTEROPERABLE STANDARDS DOMINATE ~90%

Reported subscriptions by system standard



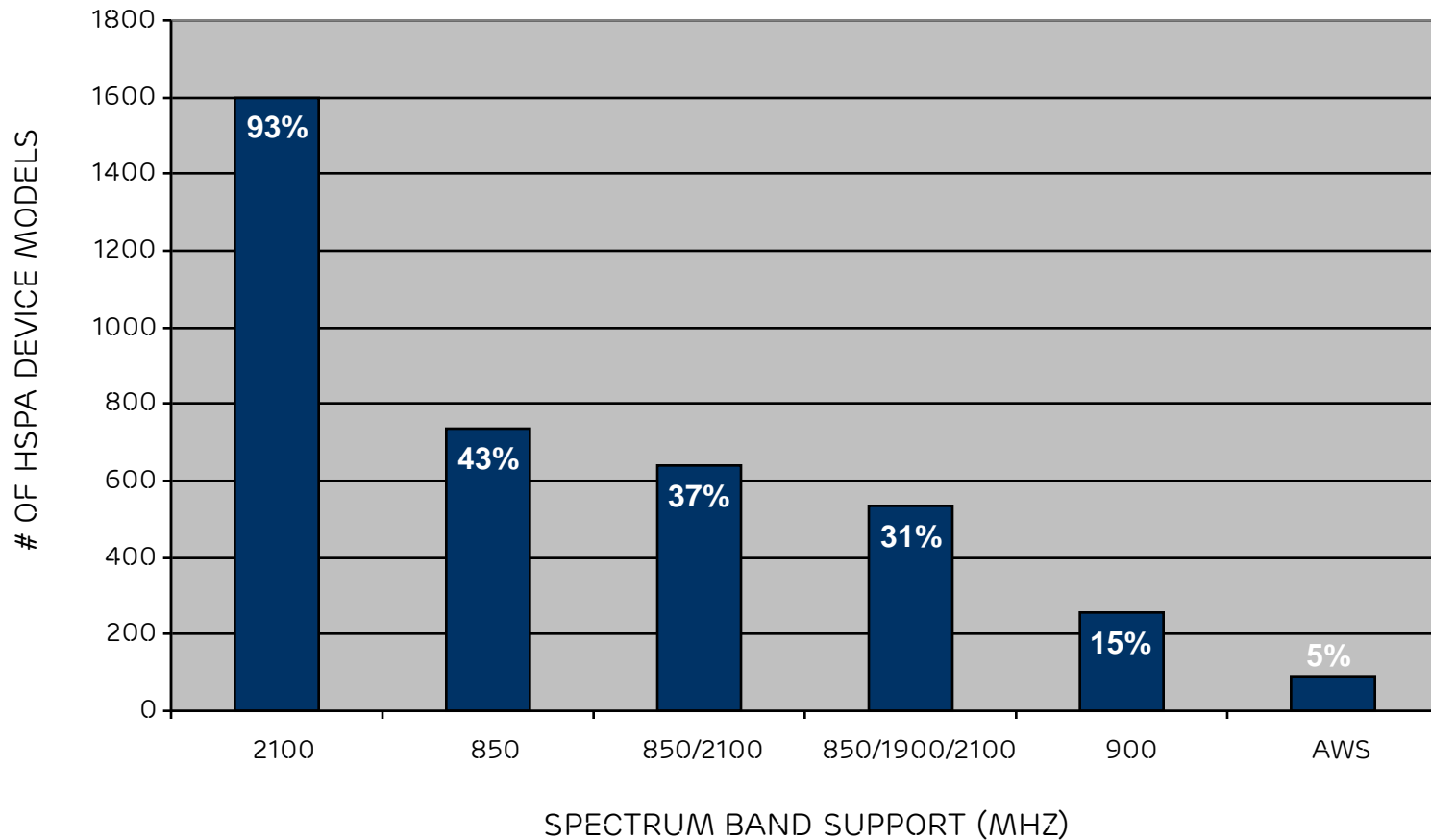
Source: Internal Ericsson

This slide contains forward looking statements

HARMONIZED SPECTRUM IS THE KEY MASS MARKET ENABLER

MAINSTREAM BAND SELECTIONS ENABLE BROAD DEVICE OFFERINGS

SPECTRUM BAND SUPPORT IN HSPA DEVICES



Source: GSA Dec 2009

HARMONIZED SPECTRUM AND STANDARDS

Harmonized spectrum is key for development of public mobile broadband access as well as for industry to be able to successfully respond to national policy goals by providing **standardized products**

- › **Economy of scale** (based on a mass market)
- › Easy **cross-border coordination**
- › **Global roaming** capabilities
- › **Interoperability** choice and convenience
- › **Efficient use** of spectrum (also in border areas)

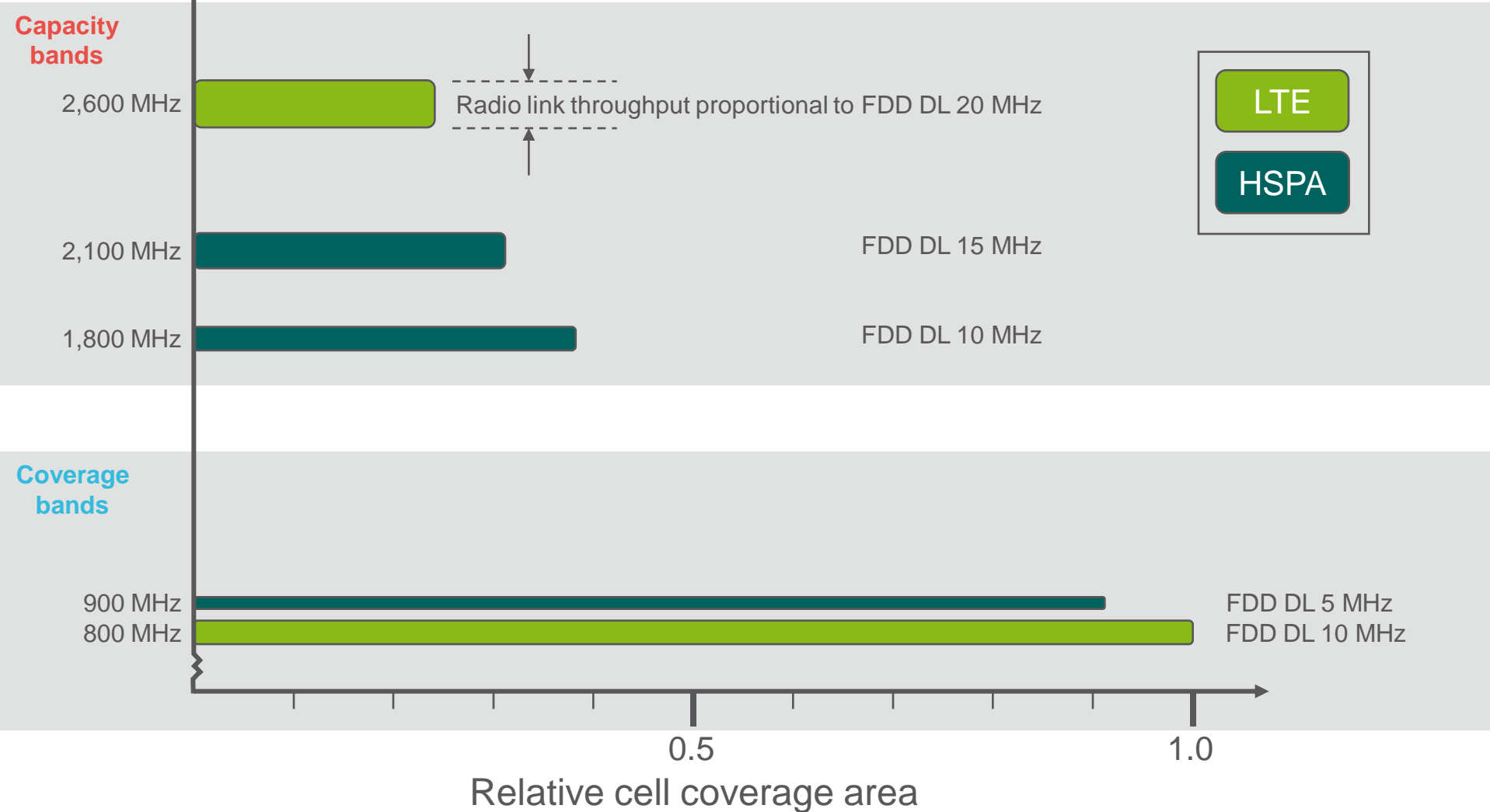


PROVIDING AFFORDABLE SERVICES TO ALL

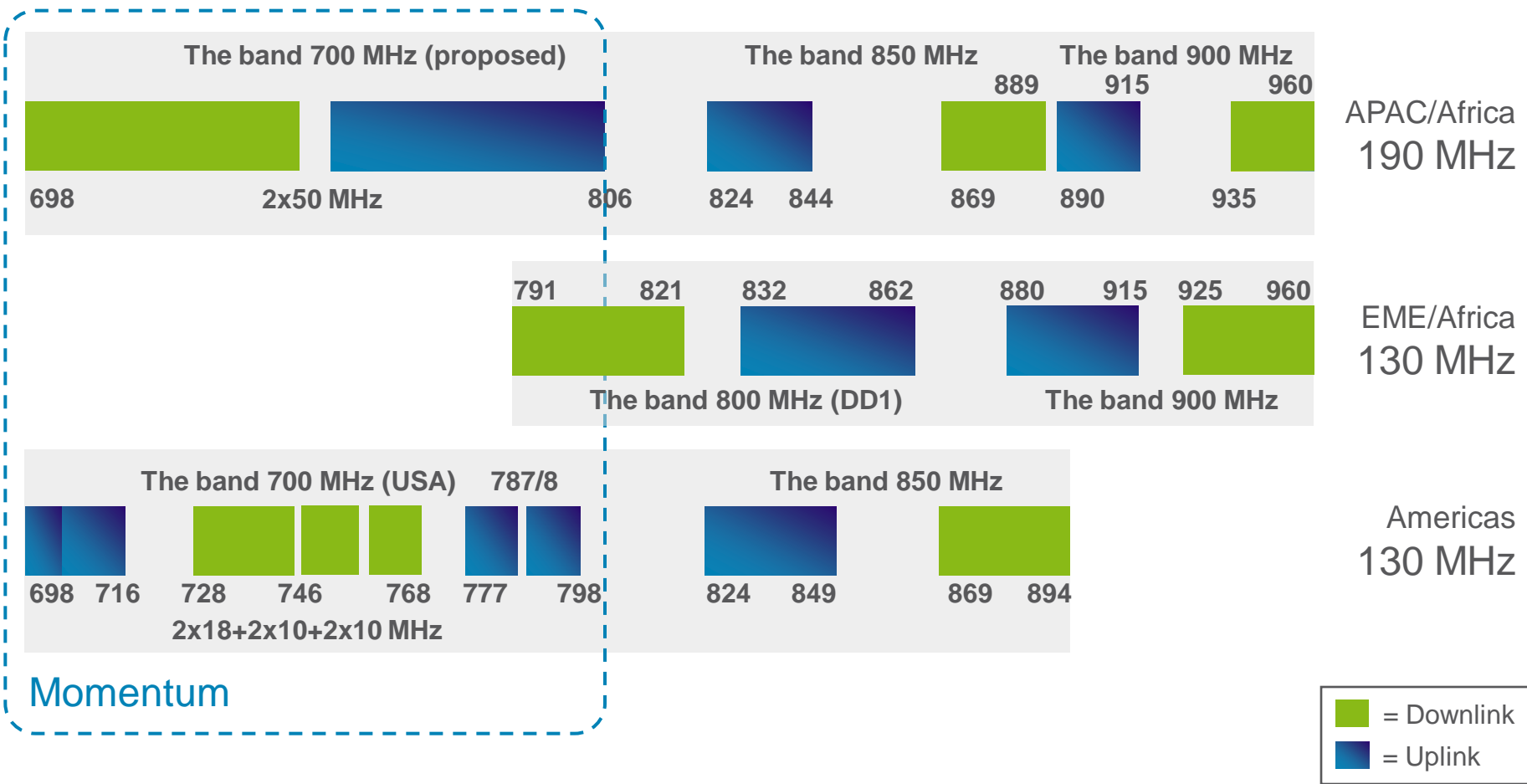
BROADBAND CAPACITY & COVERAGE

- TYPICAL DEPLOYMENT BY A EUROPEAN OPERATOR

Assumptions: Propagation based. Suburban environment. Reference frequency is 800 MHz.
 5 dB higher antenna gain at 2,100 MHz and 6 dB higher antenna gain at 2,600 MHz.
 LTE and HSPA: re-use 1

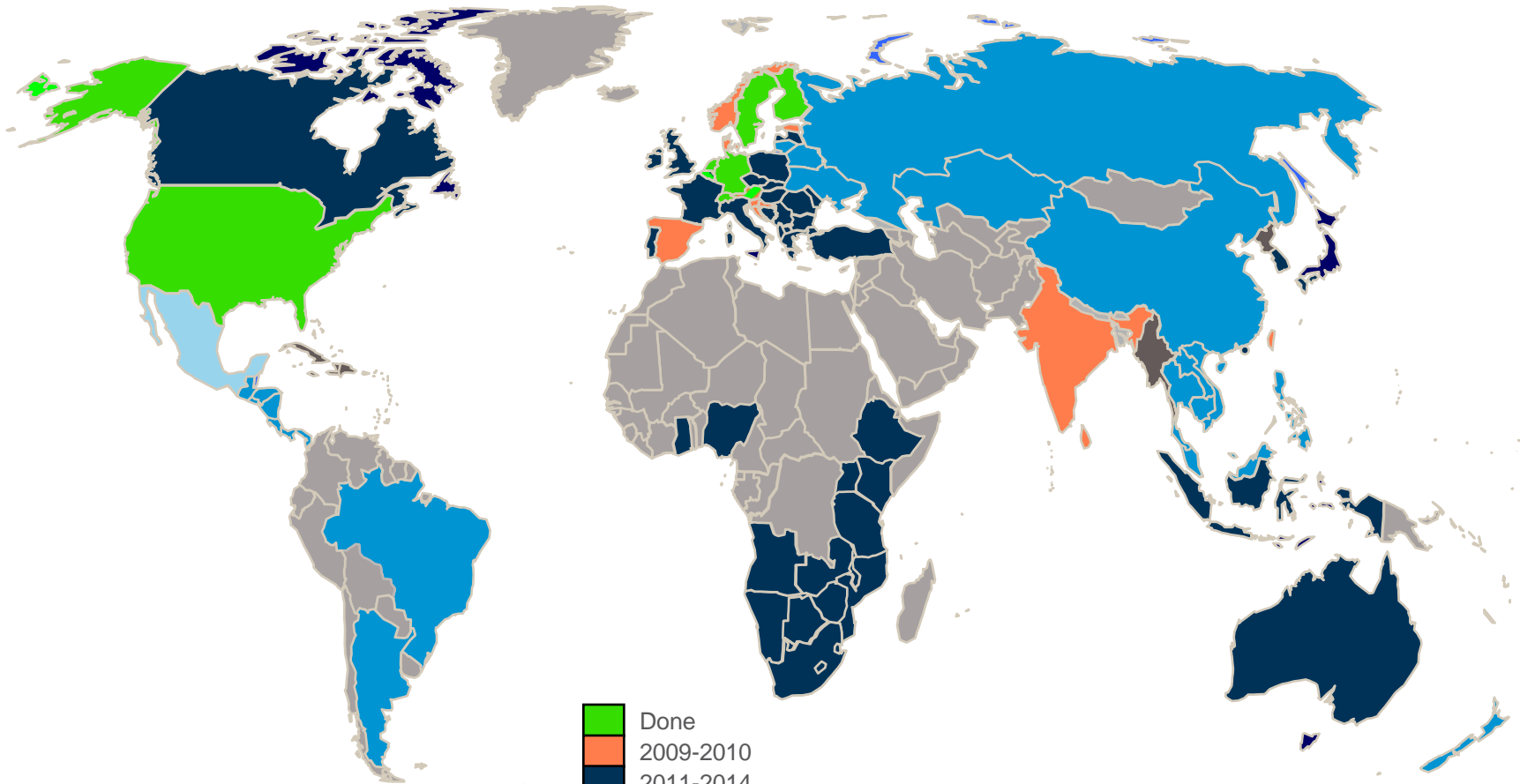


THE UHF BAND FOR MOBILE BROADBAND



OPPORTUNITY TO ENABLE BROADBAND FOR ALL

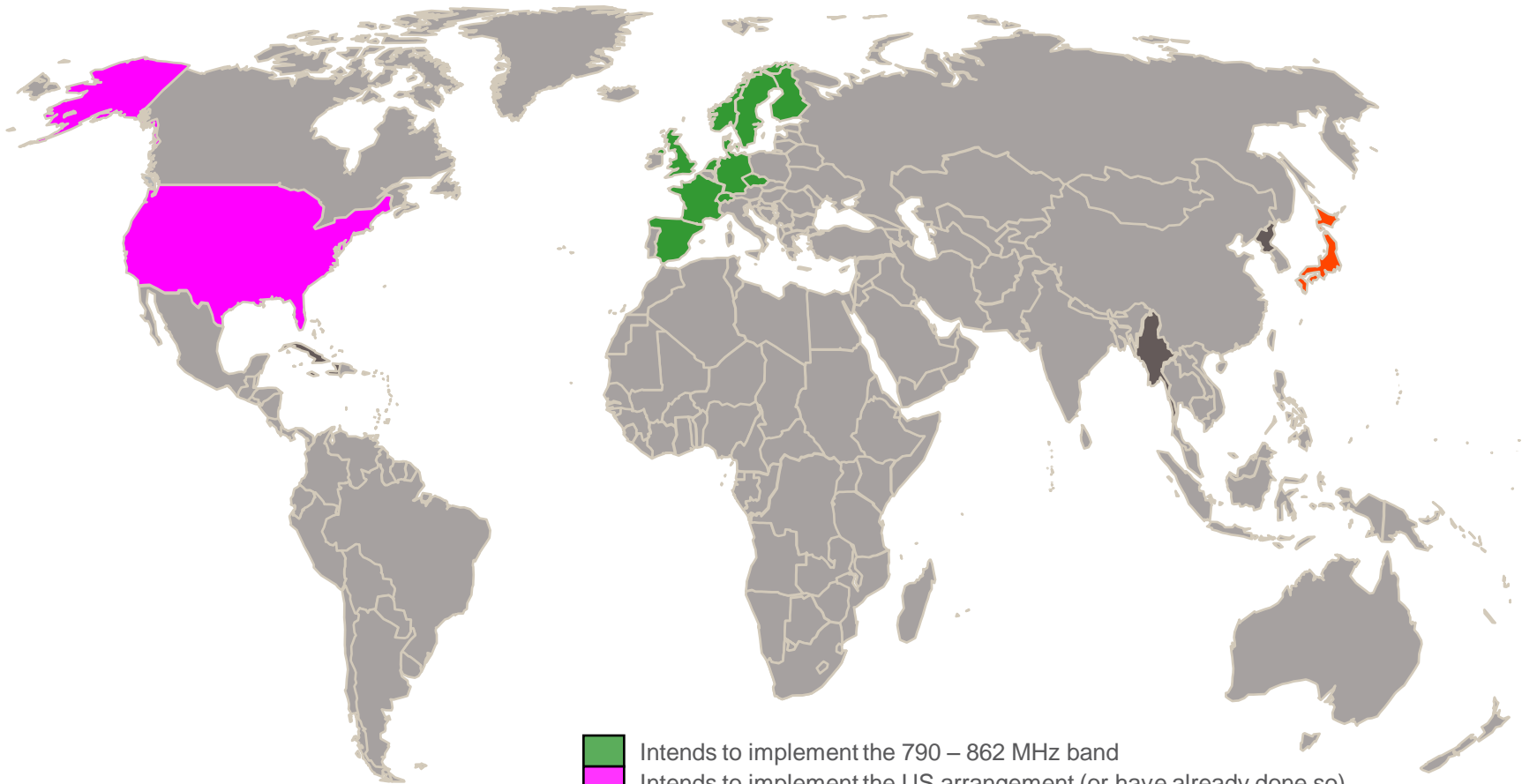
TIME SCHEDULE FOR ANALOGUE SWITCH OFF - CURRENT ASSUMPTION OCT 30, 2009









Source: NRAs, Cullen-International, CRASA, Wikipedia

- Done
- 2009-2010
- 2011-2014
- 2015-2019
- 2020-
- Unknown or not decided yet
- Embargo countries

ALLOCATION PLAN FOR THE UHF BAND - CURRENT ASSUMPTION SEP 16, 2009



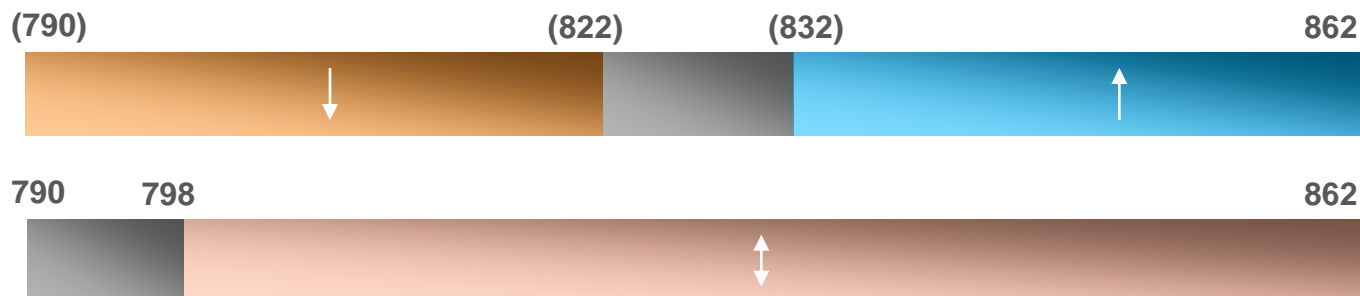
-  Intends to implement the 790 – 862 MHz band
-  Intends to implement the US arrangement (or have already done so)
-  Spectrum band conditions under development
-  Intends to implement a country specific arrangement
-  Unknown or other spectrum arrangement
-  Embargo countries

CEPT/ECC/PT1

- BAND PLAN DEVELOPMENT

Options under consideration

- 2 x 30 MHz FDD only
 - > reversed duplex directions
 - > 12 or 10 MHz duplex gap
 - > 5 MHz (or 8 MHz) channel raster
 - > guard band around the frequency 790 MHz
- TDD only
- Mixing FDD/TDD
 - > overwhelming majority against, however
 - > one country not yet convinced, but decreasing resistance (political)

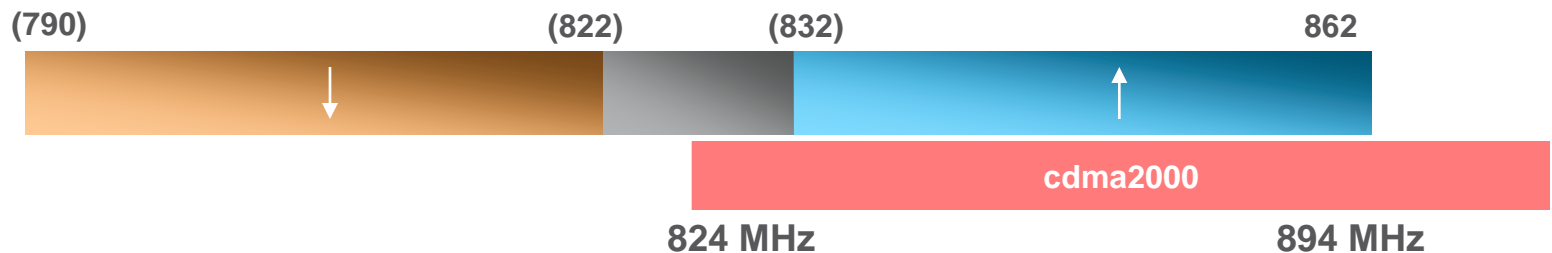


EGYPT SITUATION

- BAND PLAN DEVELOPMENT

Options

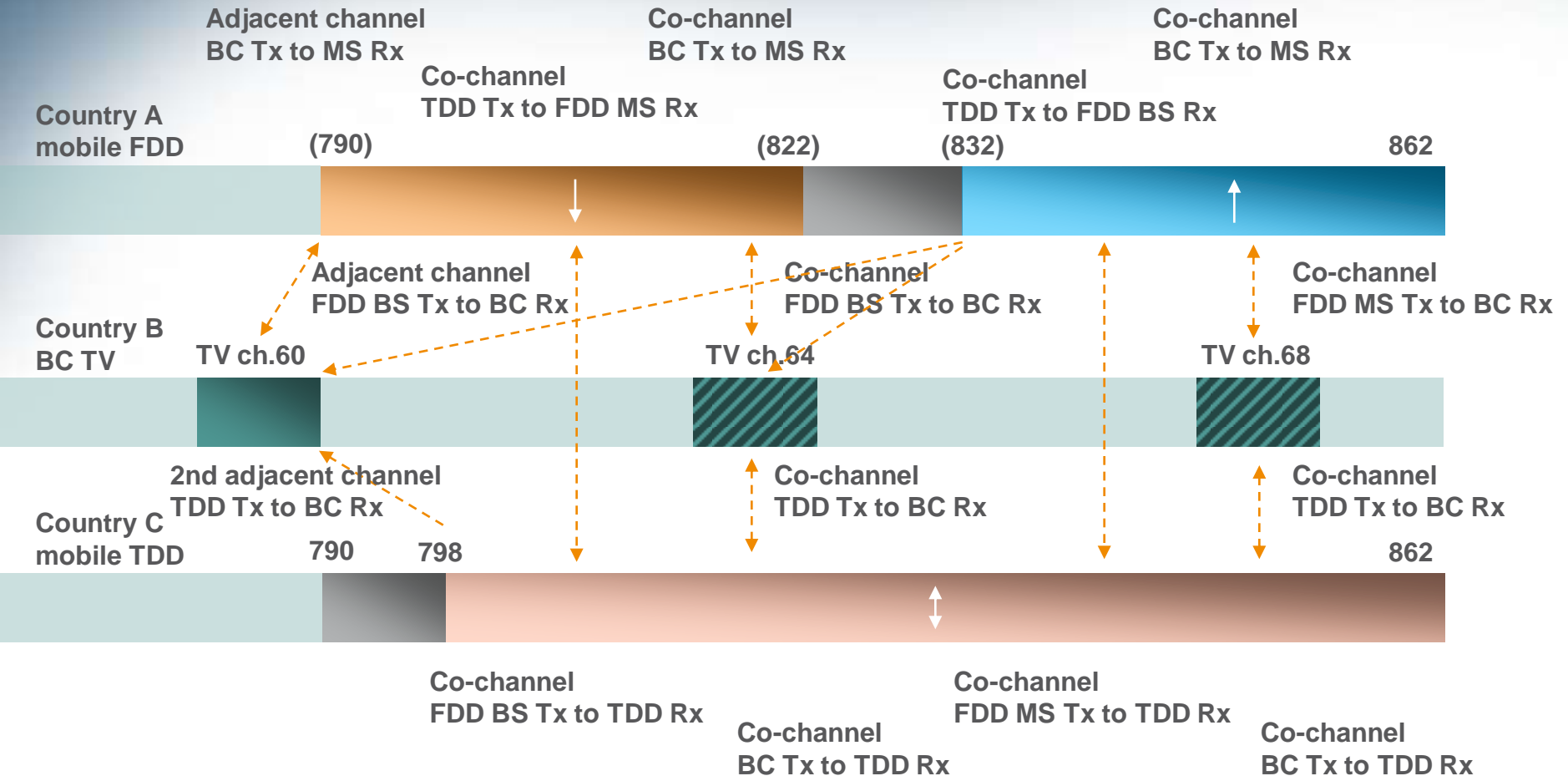
- 2 x 30 MHz FDD only
 - > reversed duplex directions
 - > 12 or 10 MHz duplex gap
 - > 5 MHz (or 8 MHz) channel raster
 - > guard band around the frequency 790 MHz
- Part of 850MHz used up by CDMA2000
 - > alternatives to minimise the impact
 - Co-existence of CDMA and HSPA/LTE
 - Geographical separation
 - Optimised arrangement for CDMA850



CEPT/ECC PT1

- INTERFERENCE BETWEEN COUNTRIES (GEOGRAPHICAL SEPARATION)

Reversed duplex directions to reduce FDD MS Tx to BC Rx



MITIGATIONS

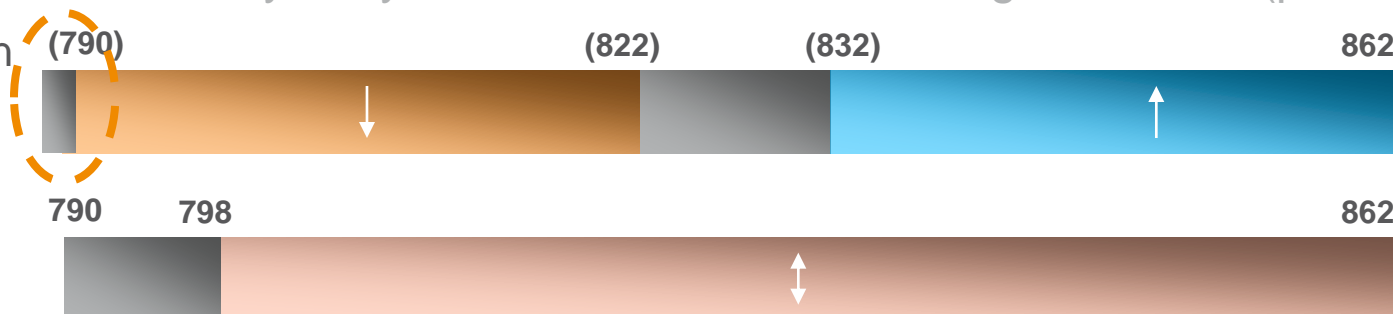
- › In “worst case” areas increase DVB signal level
 - DVB repeaters on some LTE base stations, “co-siting” mitigation technique
- › other mitigation techniques minimize number of repeaters needed
 1. filtering
 - › effectiveness of base station filters limited by DVB receiver adjacent channel selectivity
 2. careful antenna pointing
 - › ideal, if always “best case”, and in combination with filtering no repeaters are needed
 3. constraints on LTE site density
 4. constraints in LTE base station Tx power
 - › problematic when aiming for rural broadband.

POSSIBLE NEED FOR GUARD BAND

Options under consideration

- 2 x 30 MHz FDD only
 - > reversed duplex directions
 - > 12 or 10 MHz duplex gap
 - > 5 MHz (or 8 MHz) channel raster
 - > **guard band around the frequency 790 MHz**
- TDD only
- Mixing FDD/TDD
 - > overwhelming majority against, however
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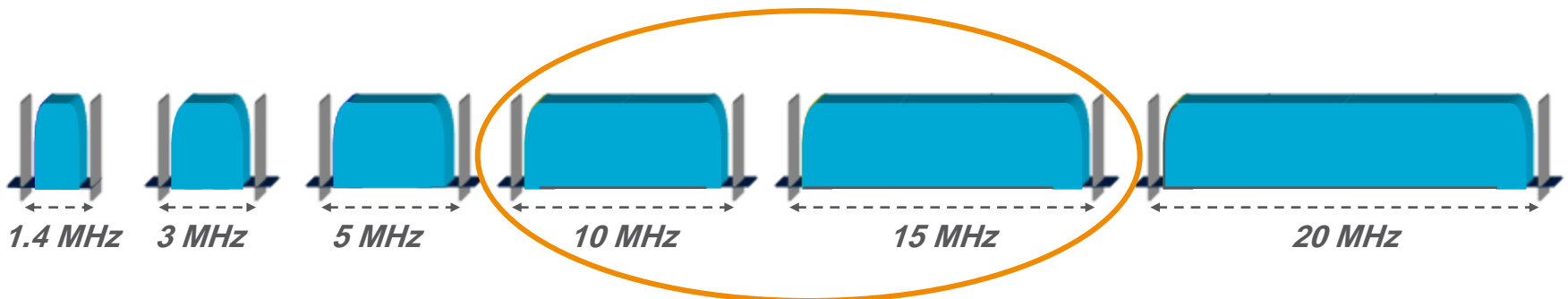
For realization
of the DVB
critical mask



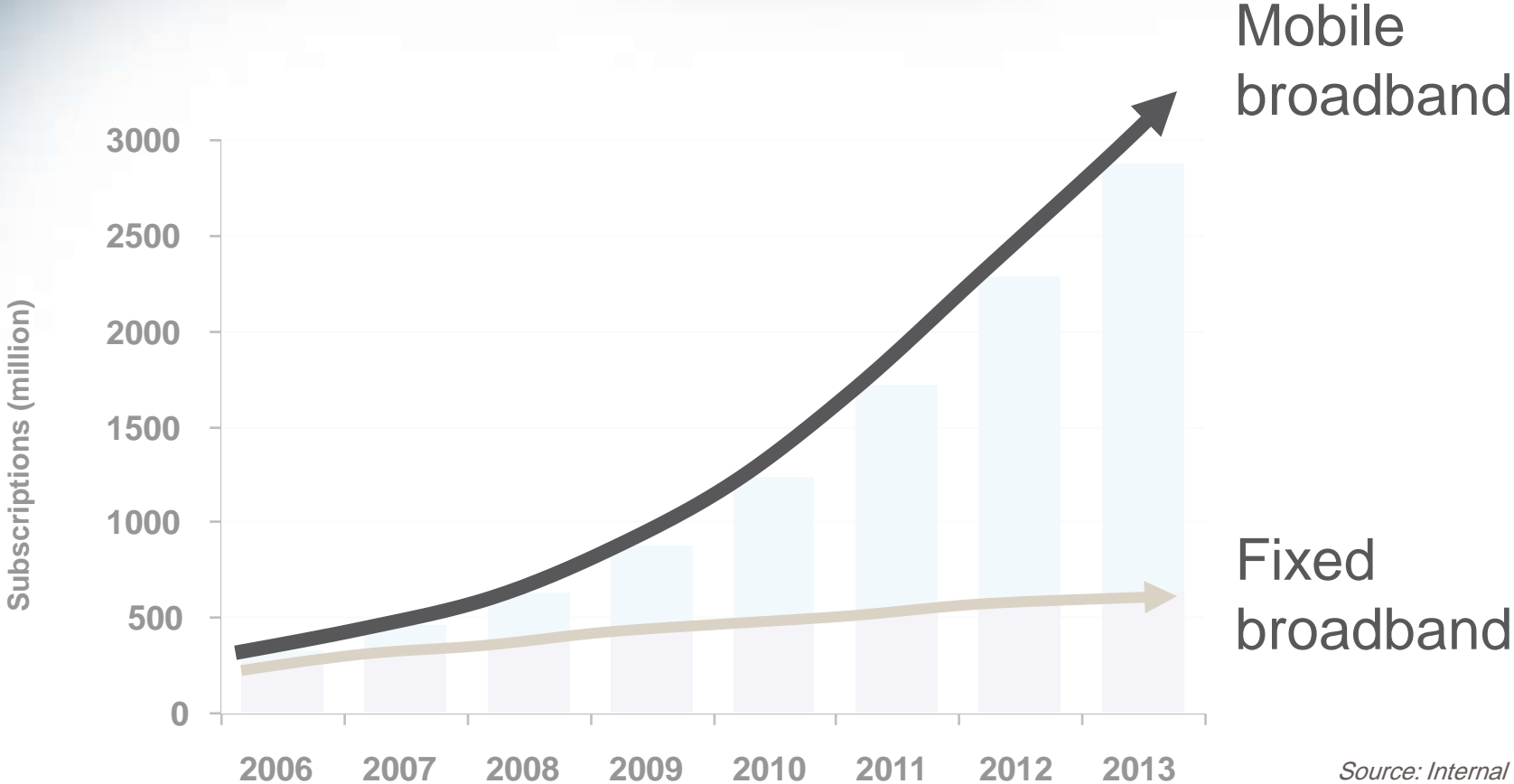
CHANNEL BANDWIDTHS

- MOBILE BROADBAND IN THE UHF BANDS

- › the 3GPP LTE technology provides spectrum flexibility for operation in differently-sized spectrum
- › for the band UHF bands, and based on a 5 MHz raster
- › bandwidths of 10 MHz or 15 MHz per operator are foreseen



MOBILE BROADBAND GROWTH



Source: Internal Ericsson

CONCLUSIONS

- ON MOBILE BROADBAND ACCESS IN THE UHF BANDS

- › digital Dividend presents a major opportunity for Mobile Broadband growth
- › significant Net present value predicted from use of the band by mobile services
- › mainstream technologies (3GPP/LTE) for cost efficiency
- › enough harmonized spectrum and bandwidths is needed
- › global harmonization not possible; but regional is
- › fair play and level playing field between the stakeholders



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