

Iraq Workshop

Making the most of Spectrum in Iraq

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23 May 2012

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Safe Harbor

Before we proceed with our presentation, we would like to point out that the following discussion will contain forward-looking statements from industry consultants, Qualcomm, and others regarding industry trends, anticipated future results and product availability, potential market size, market shares, and other factors which inherently involve risks and uncertainties, including the rate of development, deployment and commercial acceptance of CDMA- and OFDMA-based networks and technology and fluctuations in the demand for CDMA- and OFDMA-based products, services or applications.

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This presentation includes a discussion of "non-GAAP financial measures" as that term is defined in Regulation G. The most directly comparable GAAP financial measures and information reconciling these non-GAAP financial measures to the company's financial results prepared in accordance with GAAP have been included at the end of this presentation.

Overview

- Growth, pressures and trends on mobile communications
- Opportunities for Iraq
- Why mobile broadband matters for all markets

The Biggest Platform in the History of Mankind

>6 BILLION WIRELESS CONNECTIONS WORLDWIDE

~1.6B

3G CONNECTIONS NOW

~3.1B

3G CONNECTIONS BY 2015

Source: Wireless Intelligence, Jan 2012

Trends Driving Data Growth

- 3G subscriber growth
- Smartphone penetration
- Broadband connectivity
- Flexible data plans
- Shift to cloud computing



Addressing Data Demand Growth

- Evolve 3G to increase capacity and performance
- Free up 2G spectrum for more efficient 3G
- Allocate more spectrum
- Boost data capacity with larger frequency blocks for LTE
- Bring network closer to the user — add small cells like femtocells



WHY WIRELESS CONNECTIVITY MATTERS

Wireless Reach™ from Qualcomm

+0.81% GDP PER CAPITA



MOBILE VOICE

+1.38% GDP PER CAPITA



INTERNET/BROADBAND

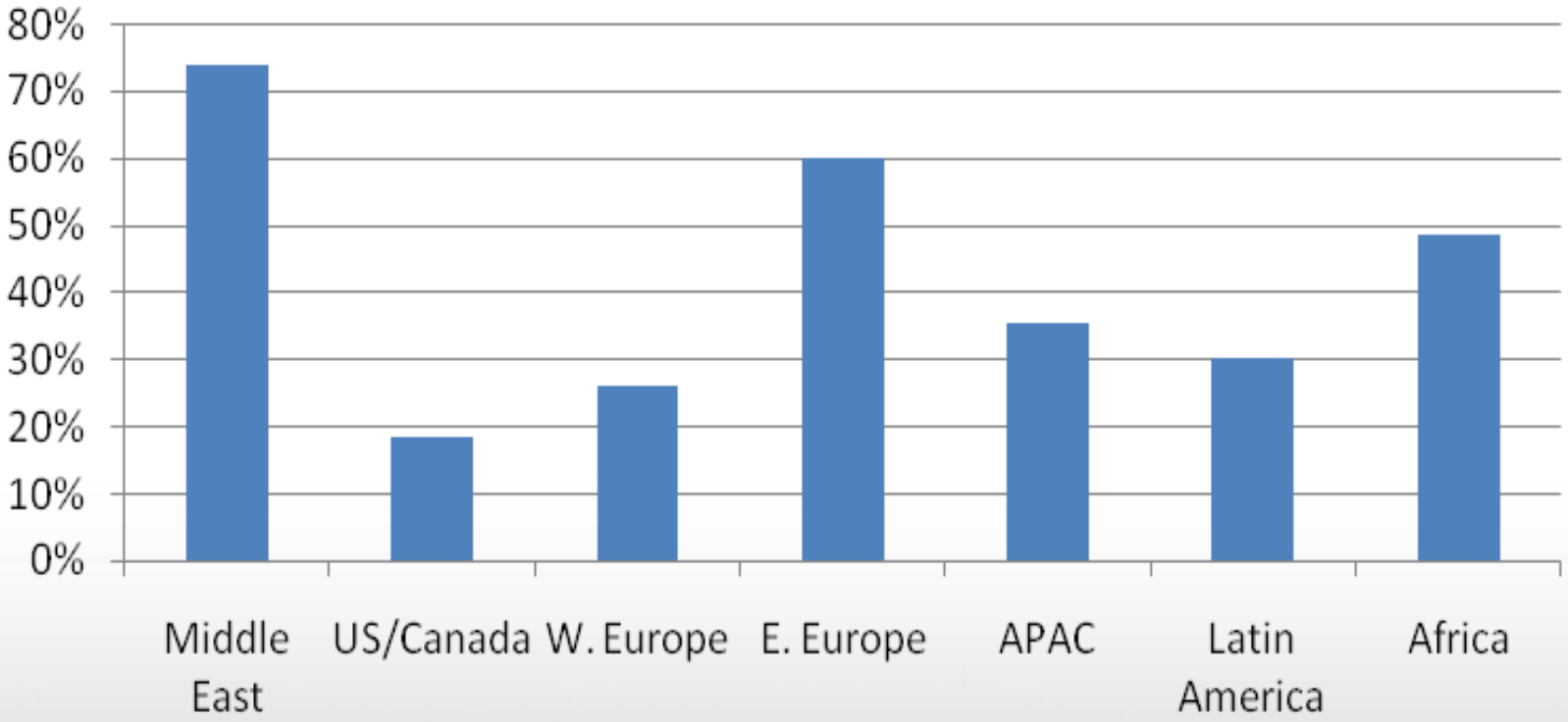
IMPACT OF A 10% INCREASE IN PENETRATION FOR DEVELOPING COUNTRIES

Source: World Bank Information and Communications for Development 2009: Extending Reach and Increasing Impact

Mobile Broadband Resources in MENA



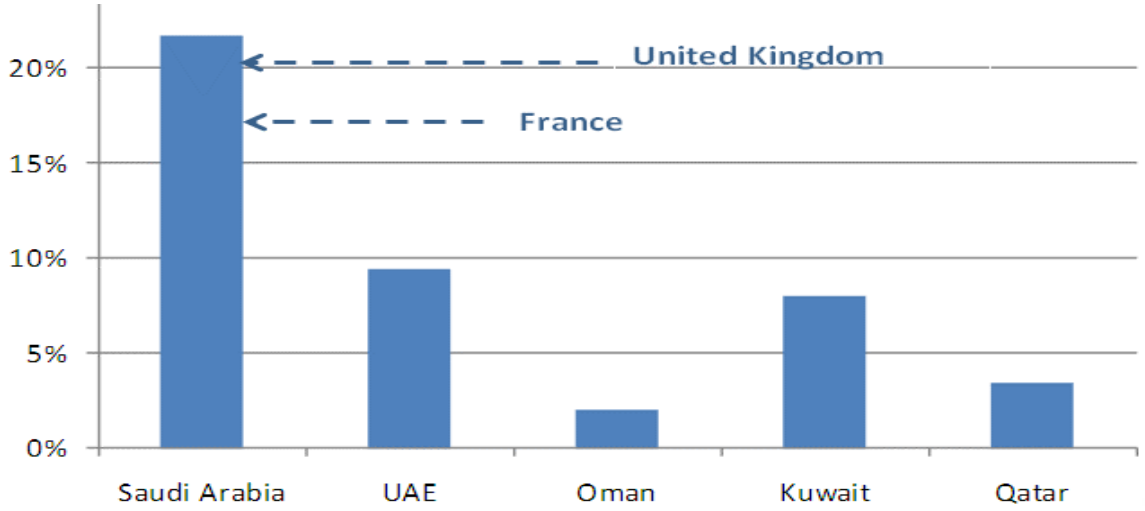
Rapid Mobile Broadband Growth in MENA



3G Connections Growth YoY (June 2010)

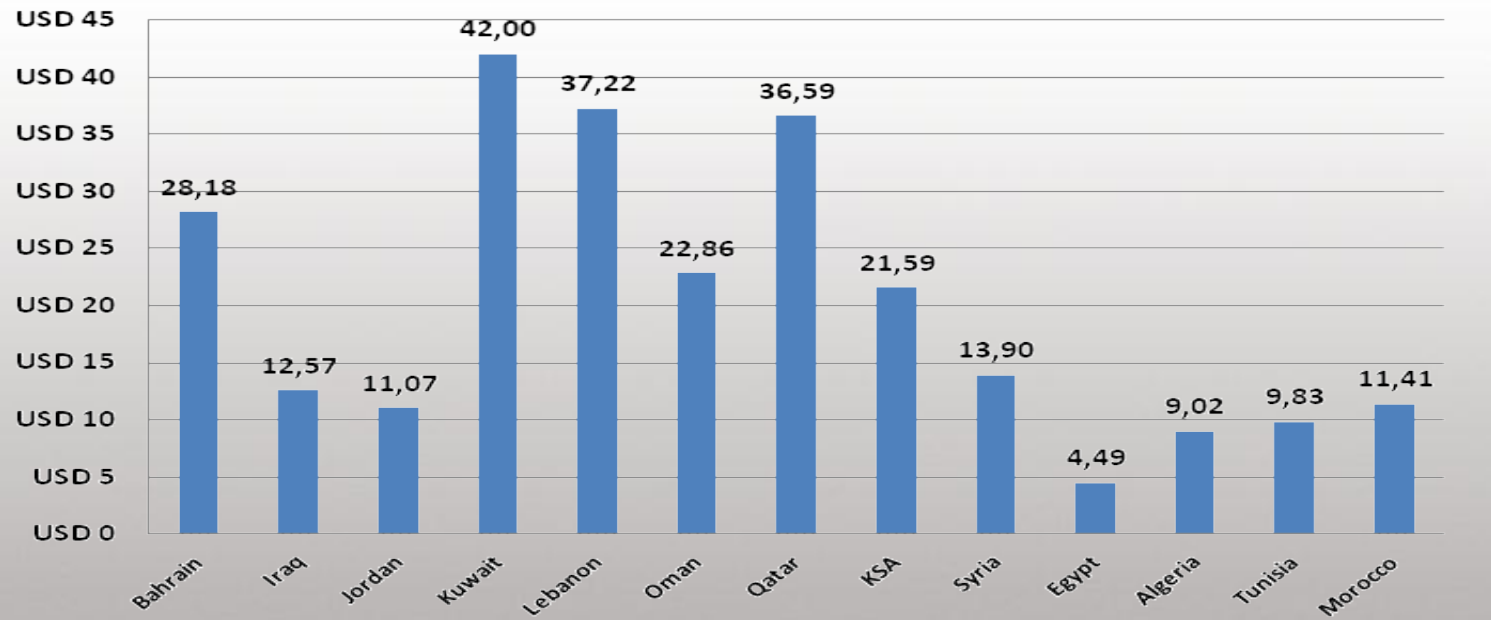
Source: Wireless Intelligence

Diverse Markets Require Different Policy Answers



Data as % of Mobile Revenues
Regional Comparison (December 2010)

MENA countries ARPU
(Q2 2011)



Source: TechPolis, Wireless Intelligence

Spectrum Opportunities & Challenges

- Call for finding more spectrum

- Spectrum should be harmonized
  - This creates economies of scale for manufacturers and, thus, more affordable devices.
  - It also enables support for international roaming and minimizes inter-system and cross-border interference.
  - Efforts at ATU, ASMG, APT and CEPT are increasing.

- Licensing for 3G
  - 3G is already operation in many countries in the world but there are some key countries

- Licensing for 4G
  - Spectrum planning takes a long time and Governments need to think long term and develop policies will in advance so that operators have time to plan and invest in network and service rollout.

Key Spectrum Policies for Sustainable Growth

UMTS900

Increases MBB affordability and enhances experience

LTE800

Award of the 800 MHz Digital Dividend in ME is crucial for MBB growth

LTE2600

Award and alignment with CEPT band plan is important for economies of scale and optimal LTE performances

3G Licensing

Algeria, Libya and Iraq haven’t yet licensed 3G. 3G will be a key driver in their economic growth and social welfare

L-band (1.5 GHz) SDL

Sits idle in most countries and represents a unique opportunity for innovation in new business models and applications

2.1 GHz band – the core band

- The 1920 – 1965/2110 - 2170 MHz frequency band is the “3G core band” which was allocated and identified for IMT back in 1992 at the ITU World Radiocommunication Conference.

- The ecosystem is mature with over 470 networks and over 60 manufacturers commercializing over 3,000 different devices supporting the ecosystem over the past years.

- Some key markets that are still taking the initial steps to introduce 3G.
  - Thailand is currently moving forward on 3G licensing this year. Plans are to auction three national licenses (2 x15 MHz assignments with a15 year duration)
  - Pakistan has been indicating the launch of an auction in 2012 but may face a delay until 2013.

- Iraq’s plans?

UMTS 900 is also becoming mainstream

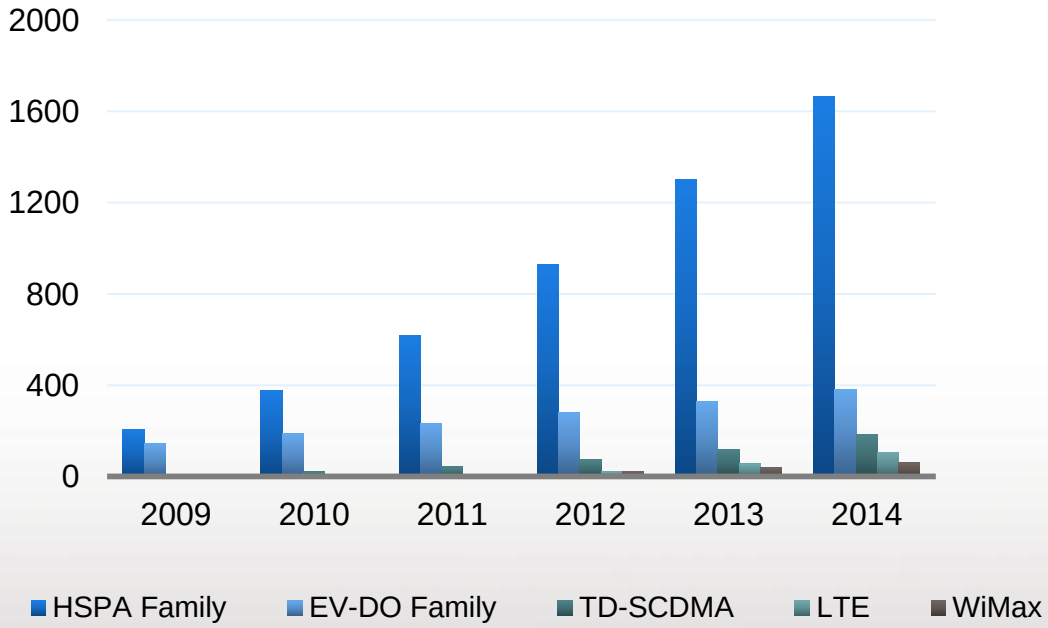
UMTS 900 IS ESTABLISHED

42 Commercial Networks

+700 Devices

>53 Countries Allow Refarming[1]

HSPA+ IS THE MOBILE BROADBAND LEADER



"…UMTS900 is standard in most new devices destined for Europe, the Middle East, Africa, and Asia Pacific markets, with the 900/2100 MHz combination for WCDMA-HSPA increasingly commonplace…"

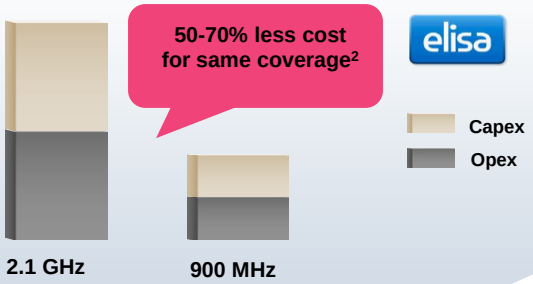
- GSA

[1] Some countries may not need regulatory approval; Source: www.gsacom.com as of May, 2012

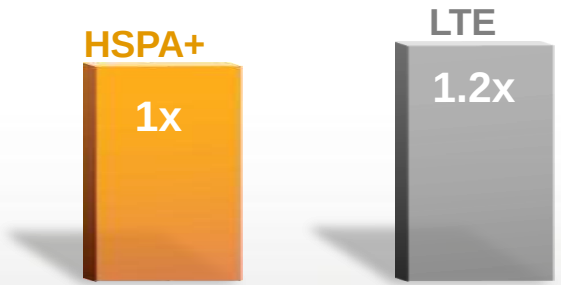
WCDMA/HSPA+: Ideal Choice for Refarming 900 MHz

Combining better coverage of 900 MHz with higher performance of WCDMA/HSPA+

900 MHz band cost-effectively expands coverage

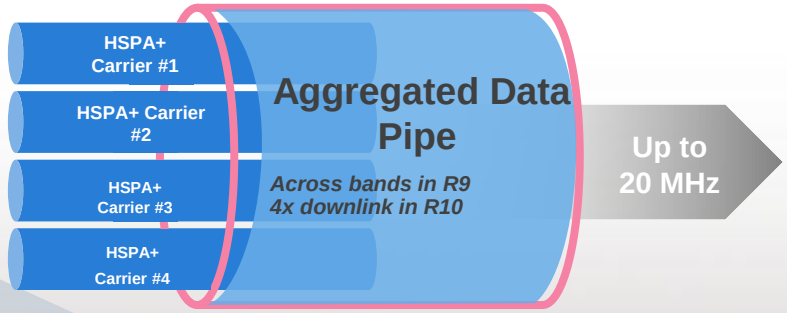


Similar performance as LTE

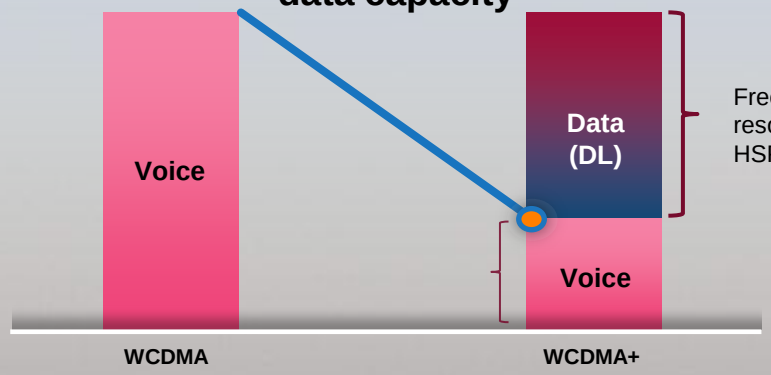


10 MHz FDD

Multicarrier further enhances benefits of 900 MHz



WCDMA+ Frees up up to 70% of cell data capacity

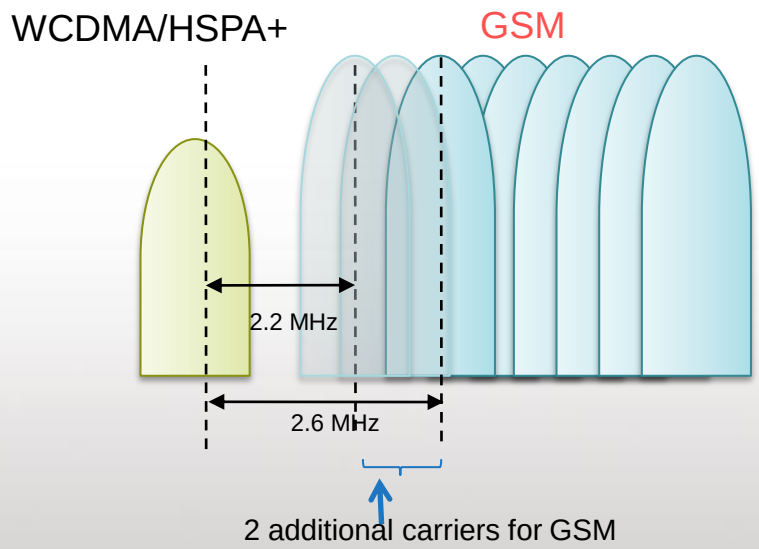


Collocation Needs Least Amount of Spectrum to Introduce WCDMA/HSPA+ 900

Collocation

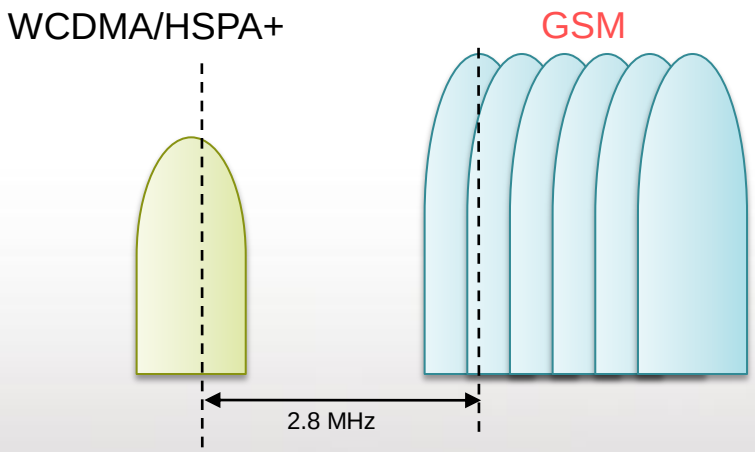
3GPP recommends 2.6MHz separation

- 2.2 MHz possible with up to 5% capacity loss



Non-Collocation

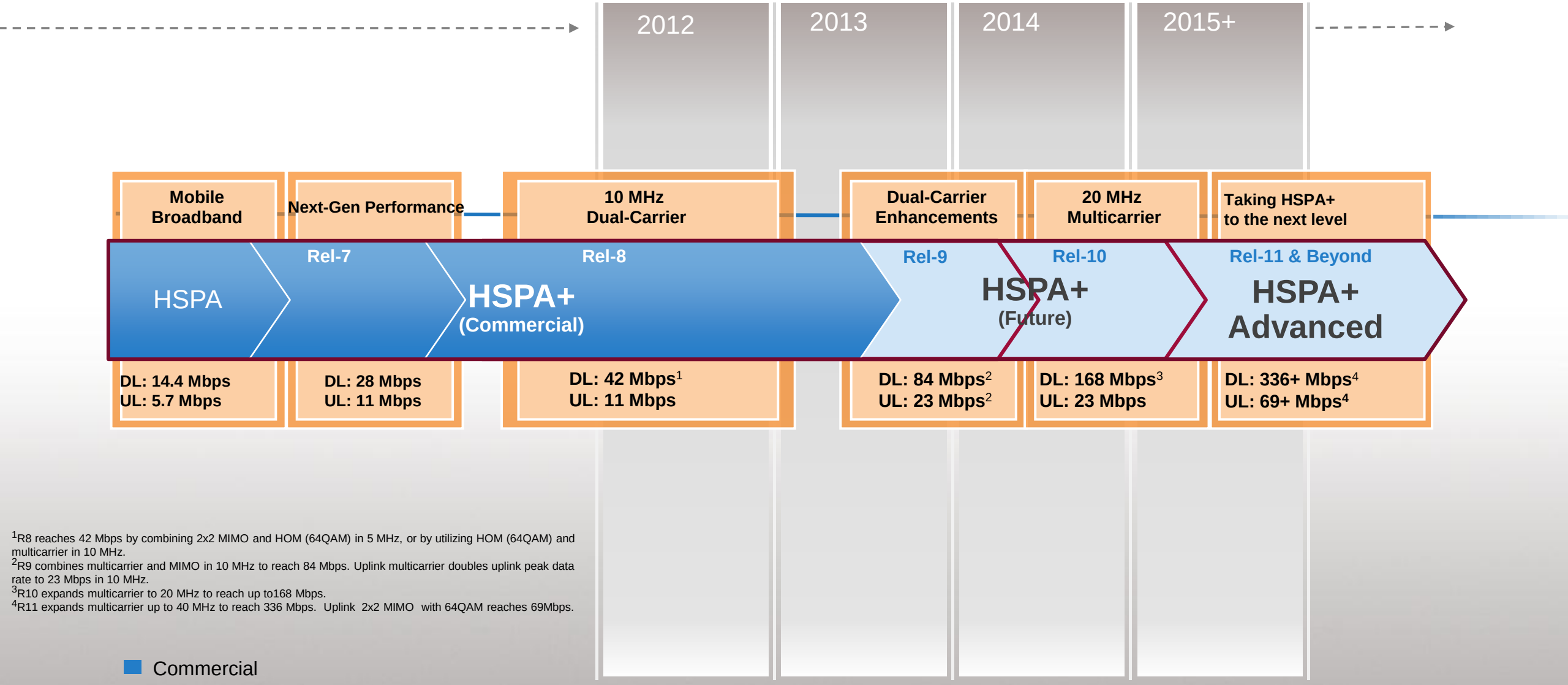
Needs min. 2.8 MHz separation



More spectrum available for GSM with collocation

Sources: 1. Compatibility Study for UMTS Operating within the GSM 900 and GSM 1800 bands – ECC/CEPT
2. Paper titled "Frequency coordination between UMTS and GSM systems at 900 MHz" submitted by Qualcomm and Huawei to 8th Annual IEEE International Symposium (PIMRC '07)

HSPA+ Has A Strong Evolution Path



[1]R8 reaches 42 Mbps by combining 2x2 MIMO and HOM (64QAM) in 5 MHz, or by utilizing HOM (64QAM) and multicarrier in 10 MHz.
[2]R9 combines multicarrier and MIMO in 10 MHz to reach 84 Mbps. Uplink multicarrier doubles uplink peak data rate to 23 Mbps in 10 MHz.
[3]R10 expands multicarrier to 20 MHz to reach up to168 Mbps.
[4]R11 expands multicarrier up to 40 MHz to reach 336 Mbps. Uplink 2x2 MIMO with 64QAM reaches 69Mbps.

Commercial

Note: Estimated commercial dates.

Created 02/08/2012

What is this all about?
Bridging the barrier between the physical and digital Worlds

YOUR PHONE WILL BE YOUR INTERMEDIARY BETWEEN
THE PHYSICAL & DIGITAL WORLDS

PHYSICAL

DIGITAL

LOCATION & CONNECTIVITY SENSORS

BIOSENSORS

MOBILE COMMERCE

LOCATION & PRESENCE

CONTENT DELIVERY

CONNECTIVITY



HEALTHCARE PROVIDER

SMART INFRASTRUCTURE CLOUD

ADVERTISING & RETAIL

BANKING

FAMILY/SOCIAL NETWORK

E-TAILER CONTENT

ENTERPRISE

Thank you

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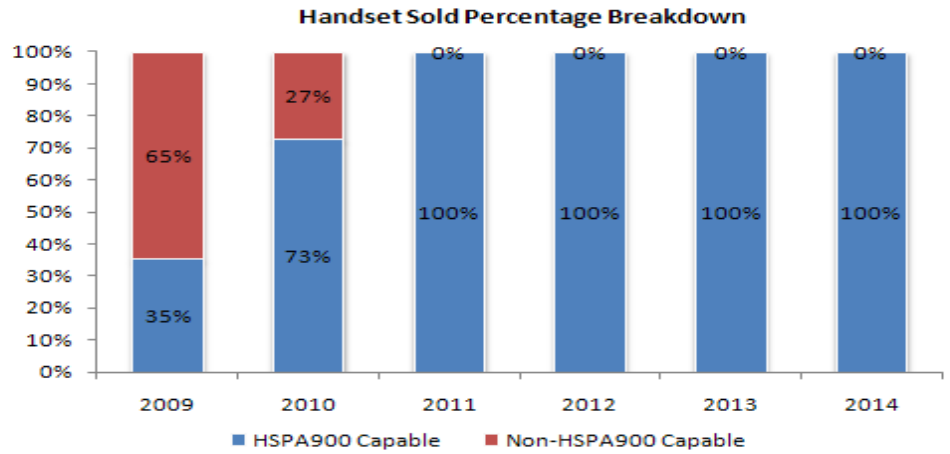
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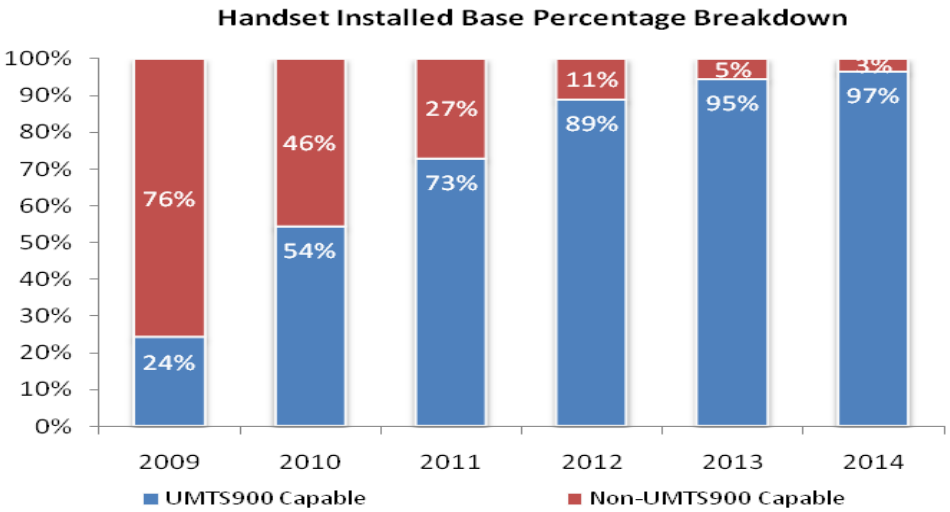
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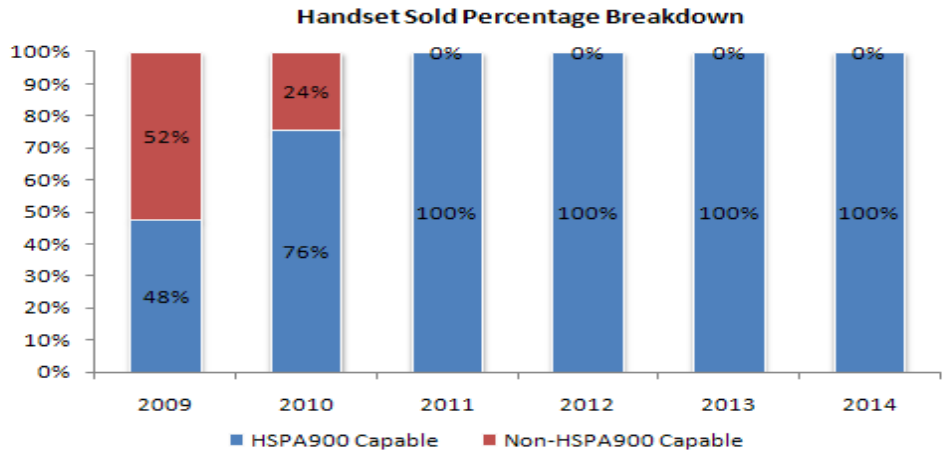
Examples of UMTS900 Installed Base

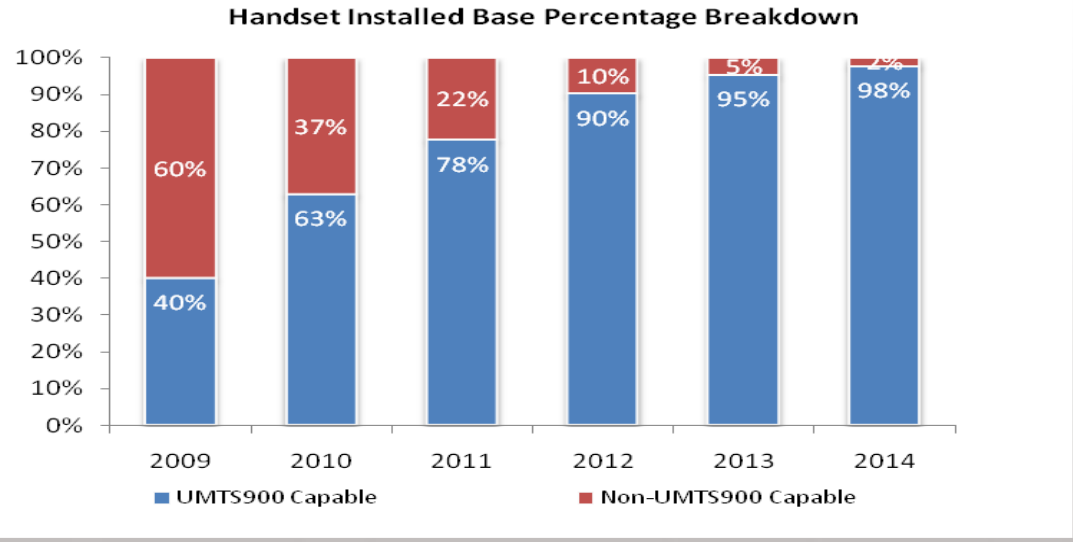
Egypt





Saudi Arabia

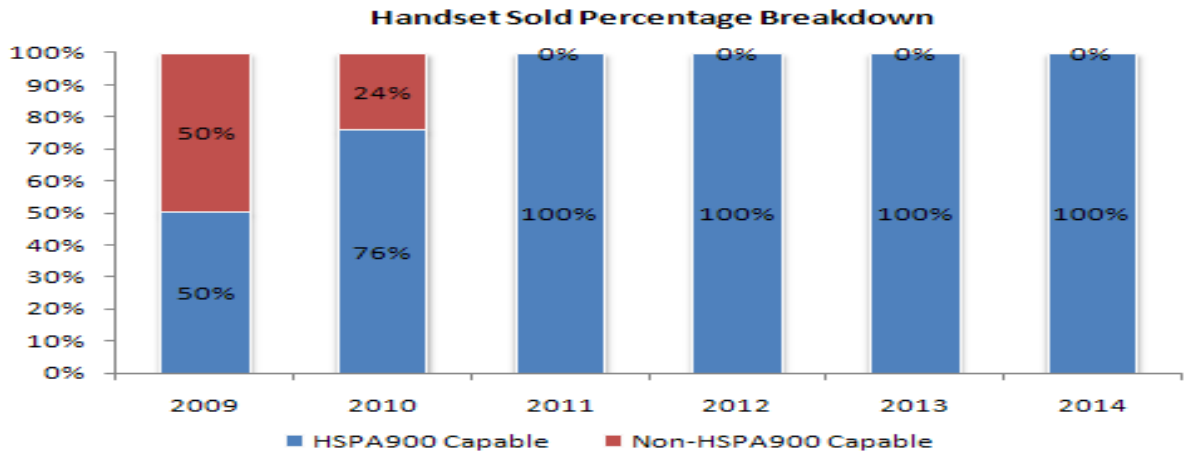


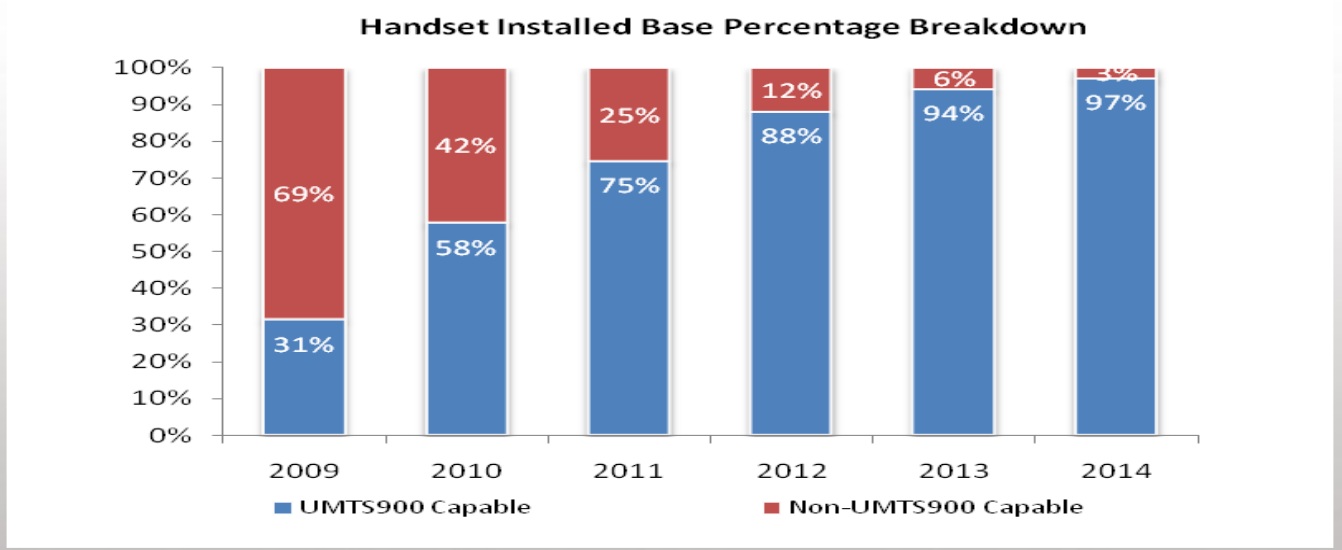


Notes: GFK data for handset device sales only

Examples of UMTS900 Installed Base

UAE





Notes: GFK data for handset device sales only