

Mobile Broadband Evolution: Sharing experience gained in competitive markets

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ITU-D Regional Development Forum
Santo Domingo, 25-27 November 2009



Summary

- (1) 3G/3G+ Mobile Broadband worldwide deployments
- (2) Mobile Broadband new data services & applications
- (3) Mobile broadband evolution towards LTE
- (4) Importance of spectrum harmonisation for Mobile Broadband



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UMTS Forum 2009 key focus areas

Communication and Promotion	
Visibility and participation at conferences, exhibitions, seminars and workshops	Relationships with international media and financial community
Key focus Areas	
Spectrum & Regulation	Global Mobile Broadband/LTE Ecosystem
Advice to industry and administrations on 3G/LTE licensing & regulation	Roadmap and competitive benefits for HSPA, LTE and beyond
Global spectrum and spectrum arrangements for UMTS/IMT-2000 and IMT-Advanced	
Key Growth Markets Action Plan	
Contributions to international organisations (ITU, EC, CEPT/ECC, 3GPP)	
Partnerships with international bodies (ETSI, NGMN, GSMA, ICU, COAI, APT, 3GAs..)	



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3G/UMTS mobile broadband: a global mass market

- Towards 600m 3G subscribers (UMTS + EVDO) worldwide
...in which 450m UMTS/WCDMA subs, including around 165m HSPA subs
- Over 3 times as many UMTS/WCDMA subscribers as CDMA2000 EV-DO
- Over 280 WCDMA networks (inc. 150 in Europe) in 125+ countries...
...in which over 260 HSDPA networks, 165 HSUPA networks,
and more than 15 HSPA+ networks launched
- Over 10 UMTS 900 networks launched
- And over 1500 3G/UMTS/HSPA devices



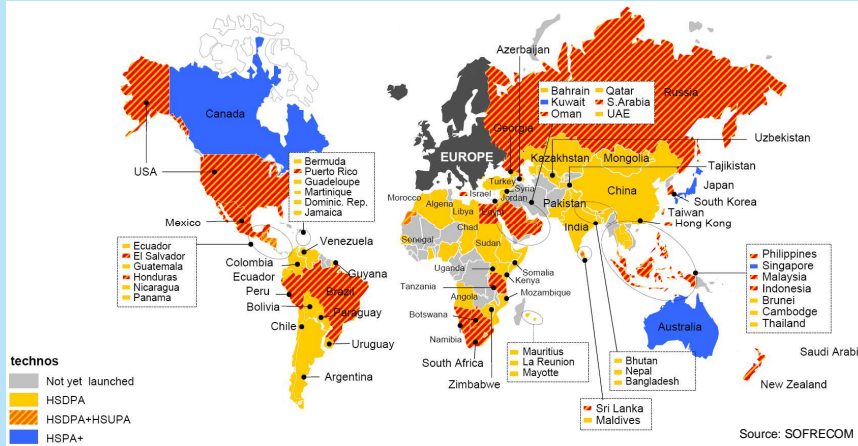
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A global presence

More than 290 HSPA networks launched worldwide (September 2009)



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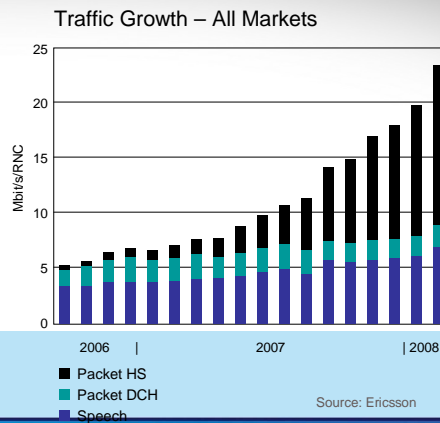
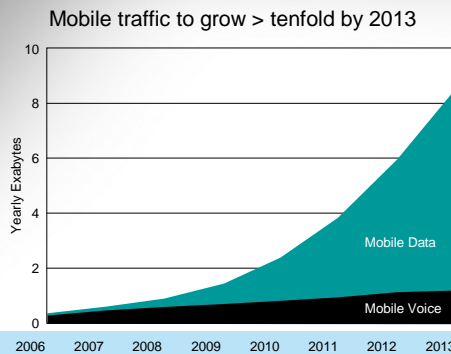
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Mobile Broadband taking off



Reality meets predictions



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The Broadband on PC, experience with HSPA



HSPA provides a robust DSL like Broadband experience

- Automatic install and configuration
- Data speeds 0.5-7.2 Mbps with mean ~2-3 Mbps
- Latency <100 ms
- Mobile use in trains and cars
- Coverage essentially everywhere
 - Applications handle short interruptions
- Robust
 - Connection stays up



Source: Ericsson



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Smartphones get smarter



Samsung

Handset vendors competing strongly in smartphone segment already popularised by Apple iPhone...

Unsurprisingly, the smartphone segment is increasingly dynamic, with ten new models announced in Q3 2009. Manufacturers are also focusing on linking location-based and social network services. The battle is also focusing on the O.S. ground (Android, Windows Mobile) and the coming of entry-level smartphones (Palm pixi, HTC Tatoo...).

LG



Sony Ericsson



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HSUPA – Service Offerings

- ✓ Examples of HSUPA services
 - Person-to-person online gaming
 - Personal Mobile WEB
 - Mobile email with attachment
 - High-quality videoconferencing
- ✓ Requirements
 - Bi-directional high data rates
 - Real time
 - Interactive
 - Low service latency



**HSUPA enables further business opportunities
(new service generation) for operators**

Source: NEC



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HSPA+

- Requested by the operators to get the maximum return from their UMTS network

Radio Interface
optimisation

- MIMO
- 64 QAM
- VoIP improvements (CPC)



Network
architecture
evolution

- Stand Alone Node B that incorporates RNC functions and connects to the CN or directly to the Internet

- Part of 3GPP Rel. 7 & 8

Source: Alcatel



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The HSPA+ growing success story...

- While today's HSPA networks support peak downlink rates of 3.6 Mbps or 7.2 Mbps, most HSPA+ networks launched to date support theoretical downlink speeds of 21 Mbps (peak). Italian operator TIM raises the bar even higher, stating peak downlink speeds of 28 Mbps at launch.
- mobilkom Austria was the first operator in Europe to launch HSPA+ in March 2009, offering network coverage in urban and rural areas to provide additional capacity where demand levels for data traffic are high. The launch was supported initially with the Huawei E270+ USB 'dongle'. Since 01 July 2009, mobilkom Austria's customers have been offered the Huawei E182e USB device that supports 21.6 Mbps downlink speeds and 5.76 Mbps on the uplink. mobilkom Austria has stated that it will also achieve increased downlink speeds of up to 28Mbps by the end of this year, via its 'Datenturbo' service.



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Mobile Broadband market in Western Europe

Mobile broadband has grown rapidly in popularity among European consumers during the past two years. This rapid consumer uptake has been catalyzed by 3G networks upgrading with HSPA, the availability of small USB devices, data tariffs fall to unlimited, and a rise in consumer penetration of portable PCs.

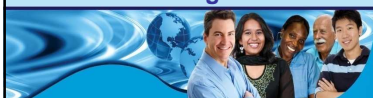
- French cellcos have put efforts on the 3G devices market, anticipating iPhone 3G hype. As a result, High-end featured smartphones range added to notebooks offerings boosted sales since YE'08 → iPhone 3G launch led French cellcos on 3G devices re-oriented strategies
- UK market was focused on mobile broadband USB dongle services
- Spanish 3G market ended the year 08 at Europe first rank, due to new data pricing business models differentiated on speeds
- In Italy, vendors and web players concluded partnerships on co-branded services
- In Germany, netbooks and mobile broadband services brought a new market breath

laissons nos envies
nous envahir

Internet, e-mails illimités* et 1 an de sms* illimités 24h/24
en France métropolitaine pour 1€ de plus,
avec la série de Noël Origami star pour Apple iPhone 3G

avec engagement de 12 mois

modèle non compatible dans toutes les zones



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Japan and South Korea leading mobile broadband

- Despite more limited growth, 3G now accounts for 95% of the 110m Japanese mobile subscribers. The MIC issued first LTE « 3.9G » licenses in June 2009 to all four cellcos, with commercial availability from 2H 2010. Emobile launched HSPA+ services in July 09, with 21Mbps DL...

HSPA+最大21Mbps対応

下り最大21Mbps、
上り最大5.8Mbpsに対応した
USBスティックタイプ



詳細はこちら

data-stick
D31HW

Emobile offers HSPA+ with the new Huawei D31 modem

- South Korea reached 21.2 million 3G/WCDMA subs at the end of June 2009, with KTF (10.4m) and SKT (10.8m) on a par. LGT showed the way for full browsing Internet with the launch of Oz (Open zone) service, with a low price flat rate plan

Source: Metro Seoul



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Mobile operator strategies in developing markets

- As mobile markets mature, the challenge that operators face is to continuously add value to the subscribers, requesting strategies that enable new value propositions, notably by investing in new technologies
- These strategies will see the offering of converged services, such as mobile TV, and of new services outside of the traditional telecommunication services, such as banking/payment services & m-commerce
- The continued introduction of converged/unified licensing regimes will see traditional mobile operators move outside of mobile communications to participate in the broader telecommunications market, notably via innovative partnerships

Source: Analysis Africa



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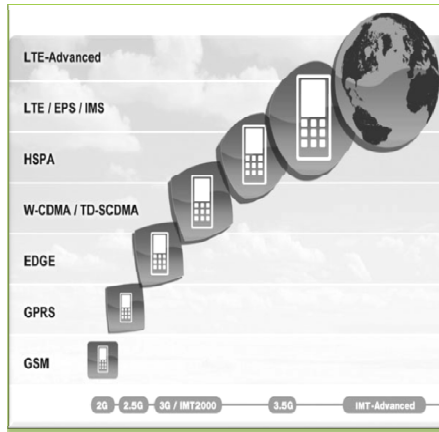
What is 3G Long Term Evolution (LTE)?

➤ The next step in the evolution of 3GPP radio interfaces to deliver "Global Mobile Broadband": **Mobile broadband is an evolutionary process to optimise current assets, before moving towards new systems, network radio interfaces and spectrum**

➔ **LTE protects operator investments in GSM/WCDMA/HSPA systems, allowing smooth migration according to market requirements while retaining the benefits of 3GPP family technologies (security, worldwide coverage, roaming, etc)**

➤ **Standardization based on improved use of the radio spectrum and on simplified system design**

Source: 3GPP & UMTS Forum



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3G/HSPA+ & LTE will enable new services and enrich existing 3G applications



Broadcast and Multi-cast Services: one-to-many transmission of high-quality video and audio

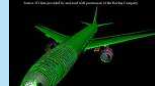


Video Telephony
Multimedia conferencing & net meeting: videoconference plus real time office applications

Gaming: real-time P2P and multiplayer gaming with console quality and performance



Industrial: Maintenance, Military, 3D CAD



Location Based Services: user or device-based



AV/multimedia: enhanced performance with legacy download and streaming applications

E-commerce: Travel services, electronic ticketing & stock trading with assured QoS and security



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Towards a new generation of services

Service category	Current environment	LTE environment
Rich voice	Real-time audio	VoIP, high quality video conferencing
P2F messaging	SMS, MMS, low priority e-mails	Photo messages, IM, mobile e-mail, video messaging
Browsing	Access to online information services, for which users pay standard network rates. Currently limited to WAP browsing over GPRS and 3G networks	Super-fast browsing, uploading content to social networking sites
Paid information	Content for which users pay over and above standard network charges. Mainly text-based information.	E-newspapers, high quality audio streaming
Personalisation	Predominantly ringtones, also includes screensavers and ringbacks	Realtones (original artist recordings), personalised mobile web sites
Games	Downloadable and online games	A consistent online gaming experience across both fixed and mobile networks
TV/ video on demand	Streamed and downloadable video content	Broadcast television services, true on-demand television, high quality video streaming
Music	Full track downloads and analogue radio services	High quality music downloading and storage
Content messaging and cross media	Peer-to-peer messaging using third party content as well as interaction with other media	Wide scale distribution of video clips, karaoke services, video-based mobile advertising
M-commerce	Commission on transactions (including gambling) and payment facilities undertaken over mobile networks	Mobile handsets as payment devices, with payment details carried over high speed networks to enable rapid completion of transactions
Mobile data networking	Access to corporate intranets and databases, as well as the use of applications such as CRM	P2P file transfer, business applications, application sharing, M2M communication, mobile intranet/ extranet

LTE will enhance today's services and enable new ones

Source: UMTS Forum / Analysys Research



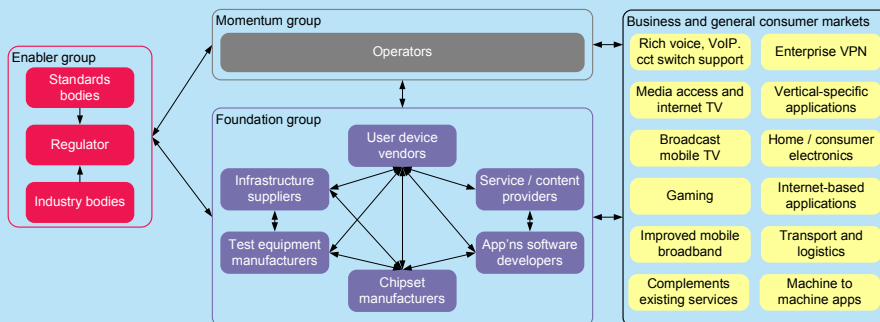
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The scope of the LTE ecosystem

- LTE will be characterized by a complex, healthy ecosystem developed by a collaborative industry
- LTE will see the emergence of dynamic new business models not hitherto experienced in the mobile space



The ecosystem will support new vertical and horizontal markets



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Regional deployment strategies will vary: USA & Europe

- **USA:** **Verizon Wireless** and **AT&T**, have declared their support of LTE. Both hold nationwide 700 MHz spectrum allowing wider area coverage outside major cities, and deployment of LTE on existing sites as an overlay mobile broadband network. The first commercial deployment planned for 2H 2010.
- **Western Europe:** the largest GSM/UMTS market in the world – LTE provides a natural upgrade path for operators. Complex spectrum situation, with auctions for 2.6 GHz spectrum, the allocation of the digital dividend spectrum, and spectrum re-farming (e.g. 900 MHz) will all impact LTE. **Sweden** and **Norway** have awarded 2.6 GHz spectrum (may be used for LTE) and Finland award frequencies in the 1800 MHz for LTE networks. Other countries' decisions on award timing and spectrum alignment plans will determine the roll out speed and scale of developing LTE networks. First commercial LTE deployments in the region are expected in 2010: **TeliaSonera** in Oslo and Stockholm; **Tele2** and **Telenor** plan to build a joint LTE network in Sweden, with commercial launch "end of 2010, or when compatible mobile devices come on the market". Other operators will follow and LTE networks will spread across Western Europe during 2011–12.



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Regional deployment strategies will vary: Asia

- **China:** **China Mobile** (to deploy TD-SCDMA, the Chinese 3G standard), **China Telecom** (CDMA2000) and **China Unicom** (WCDMA) are all deploying 3G. China Mobile actively involved in LTE trials with pre-commercial LTE-TDD network in China covering multiple major cities from the Q2 2010, but commercial availability not announced. China Telecom is expected to choose LTE FDD as a future technology, alike China Unicom. Chinese operators will have a significant advantage in that they are able to plan their LTE network as they deploy their 3G networks, which could allow LTE in China to be rolled out very quickly, with the 2.3 GHz TDD band being the initial focus.
- **Hong Kong:** **CSL** announced a LTE trial with ZTE, followed by commercial launch by end 2010
- **Japan:** **NTT DoCoMo** is very active and has chosen LTE for its network upgrade strategy, which will start in 2010 using existing 3G spectrum bands for LTE (2.1 GHz FDD). Roll out speed will be determined by demand for high speed data services in Japan (as demonstrated when NTT DoCoMo rapidly rolled out its HSPA network nationwide). NTT DoCoMo, **KDDI**, **Softbank** and **eMobile** have all expressed interest in LTE; eMobile has announced its LTE launch in late 2010, and KDDI prefers launching LTE in 2012, after 3G+ upgrade
- **Korea:** LTE faces competition from WiMAX (WiBro) which was launched in South Korea in 2006 and the main Korean operators are expected to continue to expand their WiMAX investments with backing from the Korean government. Although no clear roadmap which shows a preference for LTE, it is expected that both WiMAX and LTE will be deployed in South Korea, with the first commercial LTE deployment in South Korea expected in 2011.



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Value of long term spectrum planning

- Spectrum is a key asset for mobile communications
- Spectrum processes at international level need to be forward looking:
 - 3G spectrum identified at WARC-92
 - Additional spectrum (2G bands and 2.5-2.69 GHz) identified at WRC-2000
 - Digital dividend and capacity band (at 3.5 GHz) identified at WRC-07
 - No Agenda Item at WRC-12



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Harmonisation is still key

- Long term vision is necessary for spectrum allocation thus importance of ITU activities and in particular WRCs decisions
- There is a strong impact of spectrum harmonisation on a development of mobile broadband mass market
 - Economies of scale
 - International roaming
 - Interoperability
 - Common services ...



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Conclusions

- Harmonised approach is required across Regions to secure affordable mobile broadband with high performance at reasonable cost
- ITU plays an important role in the process of harmonisation and in particular the decisions of World Radiocommunications Conferences are key
- Mobile broadband : a global trend towards LTE



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Thank you !

For more information

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