

Mobile Broadband – Trends & Technologies

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eco InnoBrunch
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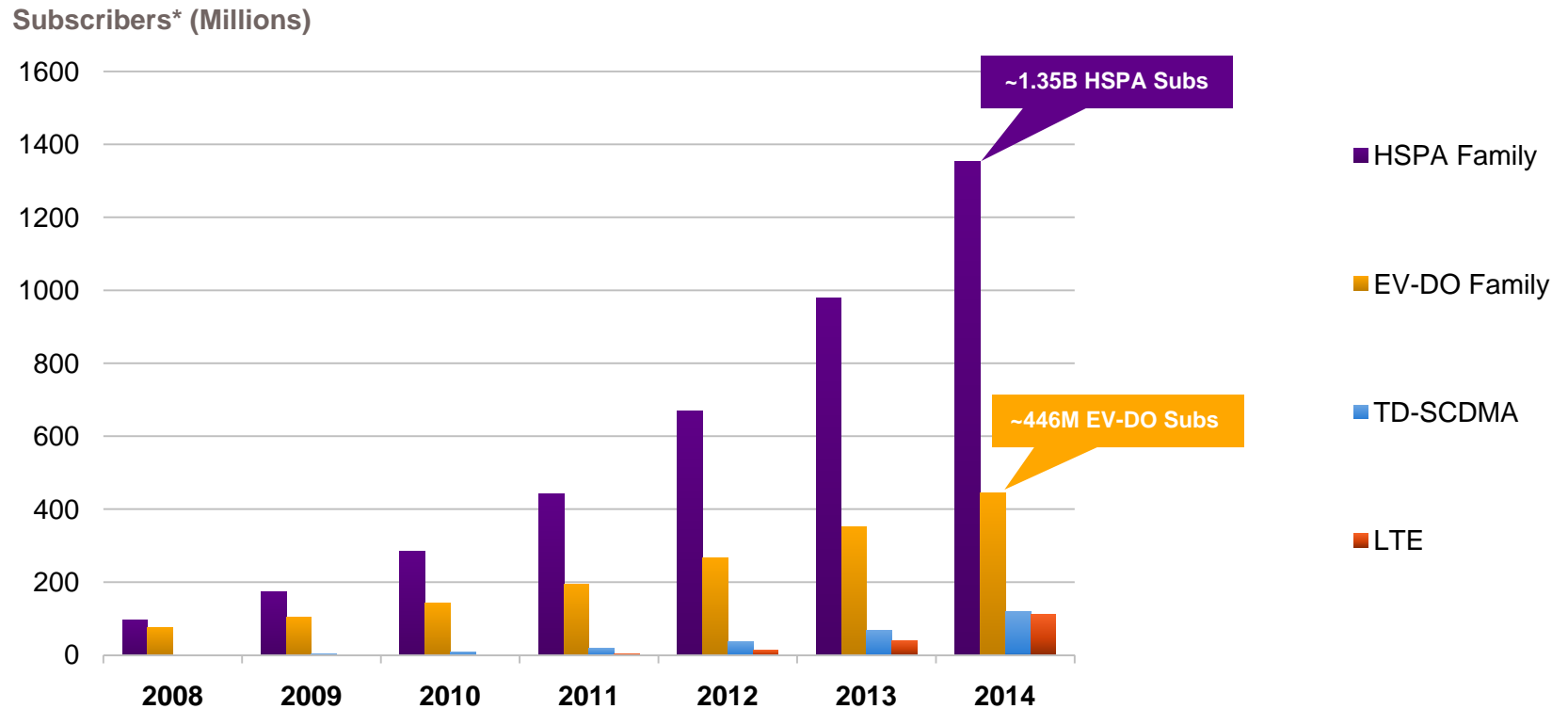


- Founded in 1985
- Global leader in developing and delivering innovative digital wireless communications solutions based on CDMA and other advanced technologies
- Partners with wireless operators, device manufacturers, independent software vendors, distribution suppliers to drive adoption of mobility solutions based on next generation wireless technologies
- Last fiscal year, invested 20%+ of revenues in R&D



Mobile Broadband Data Market

3G Will Continue to Drive Mobile Broadband Connections This Decade



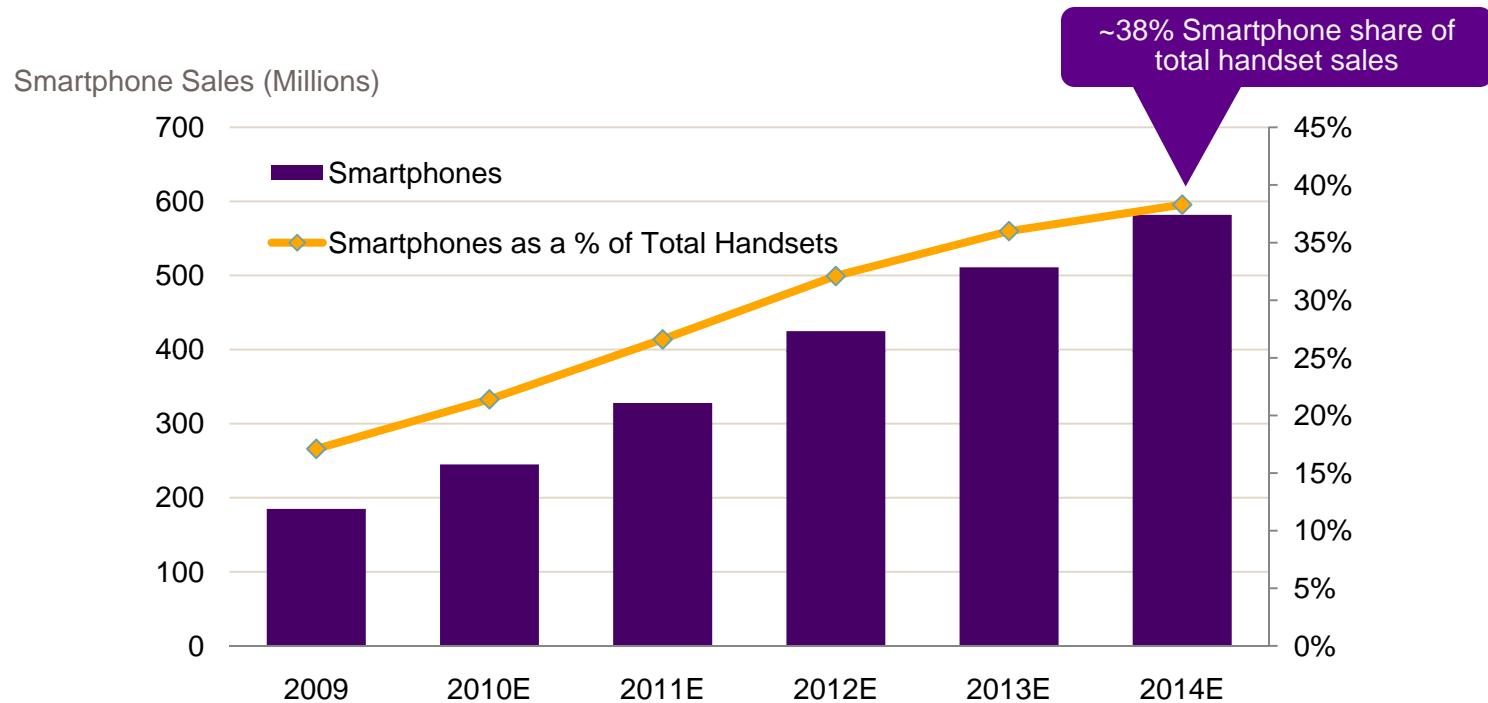
3G will enable **95%** of mobile broadband subscriptions in 2014

Note: 3G includes EV-DO family, HSPA family and TD-SCDMA

* Mobile broadband subscriber is a subscriber actively subscribing to a mobile broadband service

Source: Informa Telecoms & Media (Jan 2010)

Smartphones: The Fastest Growing Segment of Mobile Devices Market



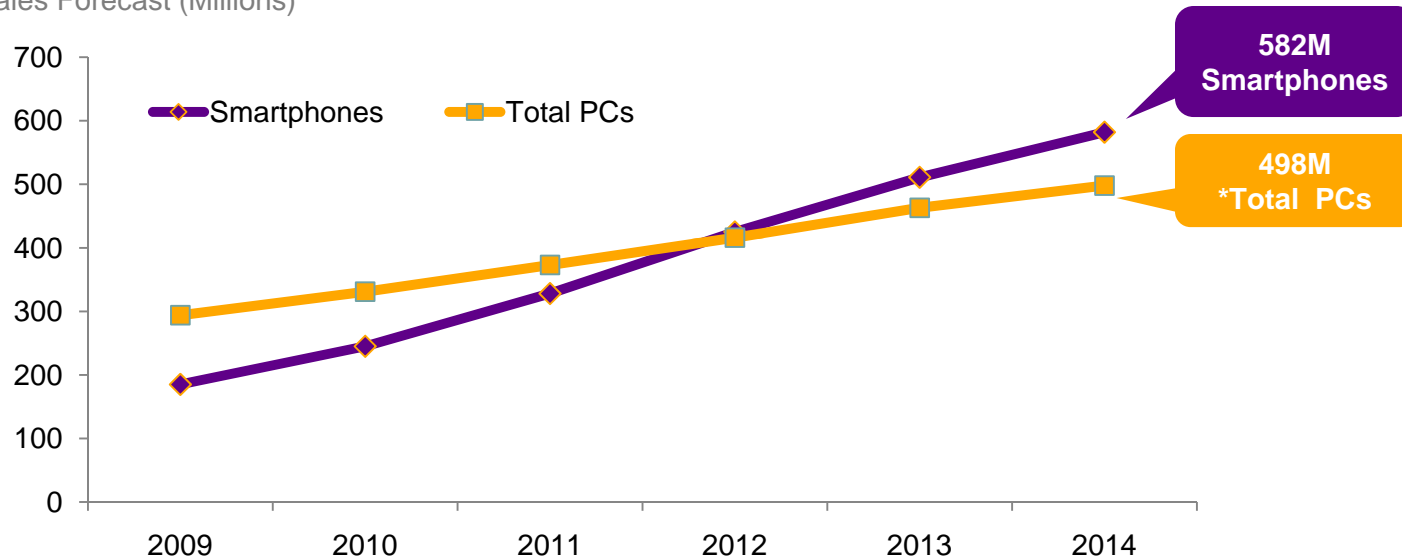
Smartphone sales expected to reach more than half a billion by 2014

Strong growth rates are estimated for the forecast period

- ~33% y-o-y from 2009-2010
- ~26% CAGR from 2009-2014

Smartphones quickly becoming a dominant computing platform

Global Sales Forecast (Millions)



Smartphones to outnumber total PCs by 2012

Smartphone growth is projected at ~26% CAGR (more than double of that of total PCs)

Smartphones to be ~38% of total handset market by 2014

*Total PCs include Desktop PCs, Notebook PCs and Netbooks

Sources: Total PCs: ABI Research, (Q110), IDC (Mar10), In-Stat, (Sep09), and Strategy Analytics (Mar10)

Smartphones: Informa Telecoms & Media (1Q2010)

New Devices, New Categories, New Opportunities



Growth Drivers for Mobile Data Services

- Higher throughput (data rate) and capacity
- Attractive data tariff plans
- Improvement in device technology and convergence
- Devices with integrated mobile data technology support (multi mode and multi band) and enhancement of battery life
- Increase of easy-to-use mobile internet enabled devices
- Growth of social networking Internet sites & innovative mobile applications
- Eco-System available “on time”
- Increasing performance over today’s infrastructure (investment protection)
- Availability of sufficient spectrum

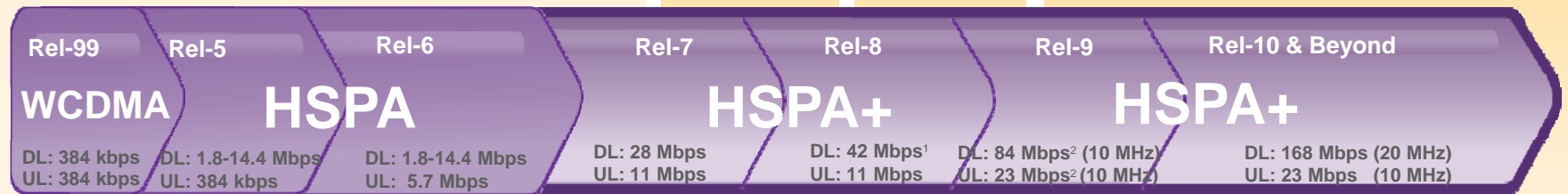


Evolution Path of Mobile Broadband Technologies

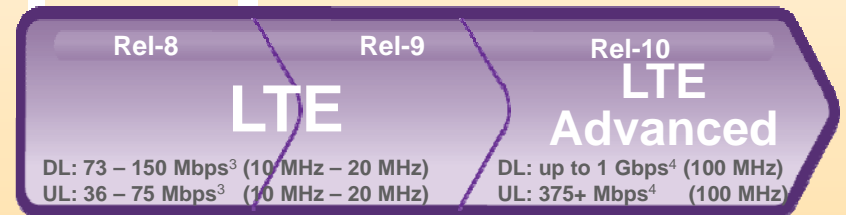
HSPA+ Has a Strong Evolution Path LTE is on a Parallel Evolution Path

Excellent Mobile Broadband
Voice and Full Range of IP Services

Enhanced User Experience
Improved voice and data capacity



LTE leverages new, wider and TDD spectrum



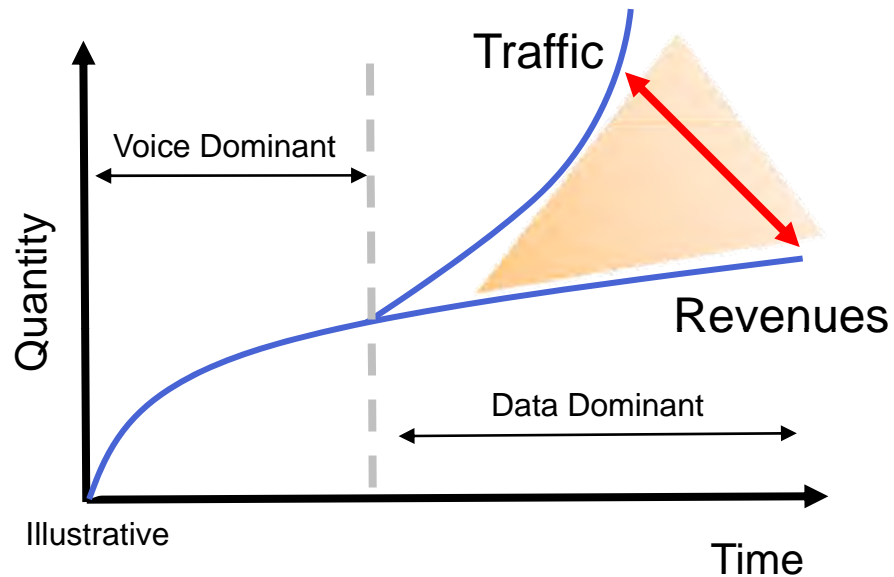
2010

2011

2012+ ----->

¹R8 will reach 42 Mbps by combining 2x2 MIMO and HOM (64QAM) in 5 MHz, or by utilizing HOM (64QAM) and multicarrier in 10 MHz.
²R9 combines multicarrier and MIMO in 10 MHz to reach 84 Mbps. Uplink multicarrier doubles uplink peak data rate to 23 Mbps in 10 MHz.
³Peak rates for 10 and 20 MHz FDD using 2x2 MIMO, standard supports 4x4 MIMO enabling peak rates of 300 Mbps. TDD rates are a function of up/downlink asymmetry. Peak data rates takes overhead into account, per standards 172 Mbps is achievable in 20 Mhz.
⁴Peak rates can exceed 300 Mbps by aggregating multiple 20 MHz carriers planned for LTE Advanced (LTE Rel-10). Peak data rate can exceed 1 Gbps using 4x4 MIMO and at least 80 MHz of spectrum

Operator Challenges



- How to increase revenues and profits?
- How to handle the growth of capacity requirements?
- How to keep costs (CAPEX and OPEX) under control?
- How to decrease the „cost per bit“?

Addressing Data Demand Growth

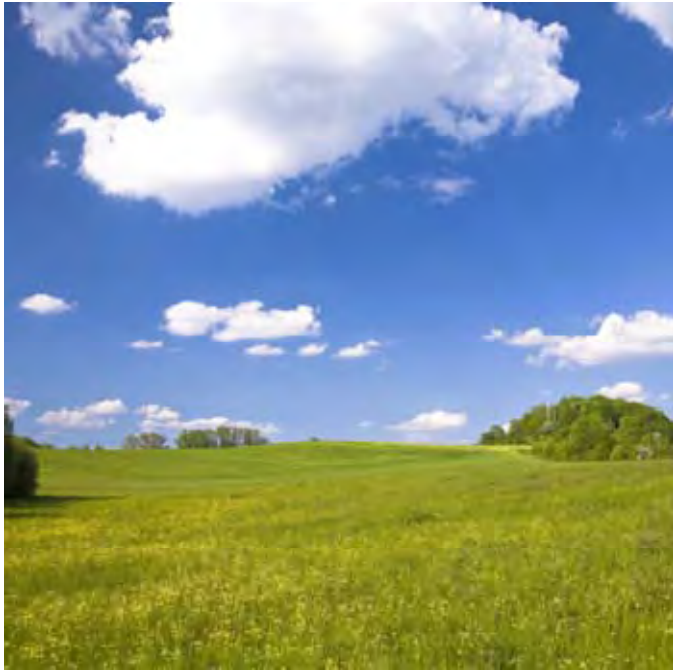


- Offload Data Traffic (e.g. with femtocells)
- Use 3G in lower frequencies (e.g., UMTS900/1800 refarming)
- Evolve 3G and leverage advanced receivers
- Increase voice capacity to free up resources for data
- Boost data capacity with LTE for new and wider spectrum



Summary

- Innovative (smart)phones, new categories of devices, faster mobile networks, and affordable data plans continue to enable growth in mobile data services and applications.
- Mobile data traffic growth can be addressed by offloading 3G traffic (e.g. femtocells), deploying 3G in lower frequencies (e.g. UMTS900/1800 refarming), evolving 3G technologies (e.g., HSPA+ and multicarrier), and boosting data capacity with LTE for new and wider spectrum
- There is no one revenue generating “killer” (mobile) application. It’s about developing and marketing mobile applications and services that add value to customers.
- 10 years after the first 3G (UMTS) auctions in Germany (\$46 billion) and UK (\$34 billion), mobile data traffic is growing exponentially.
- Fixed Internet goes Mobile with social connections, e-mail, video download, and instant messaging being main category of usage. Steep rises in mobile internet being enabled by social networking.



Thank You!