

The impact of spectrum harmonisation on Digital Dividend handset costs

Background

European governments are considering how much of the UHF spectrum (470 to 862 MHz) currently used for analogue television will be made available for mobile broadband services following the planned switchover to digital television. This UHF spectrum – the Digital Dividend - is vital to allow mobile broadband to be offered in rural areas in a cost effective way and support in-building coverage in urban centres.

The success of GSM and HSPA has been due, in part, to spectrum harmonisation across Europe and with other regions of the world. Harmonised spectrum has enabled the mobile industry to leverage economies of scale driving down handset and network equipment costs and encouraging innovation.

There has been considerable progress internationally in harmonising the UHF bands at an international level. The World Radiocommunication Conference in November 2007 agreed that the top end of the UHF band should be harmonised. The conference identified the band 790 to 862 MHz for mobile broadband services in EMEA.

However, some European countries are contemplating adopting their own distinctive band plans for the UHF spectrum rather than coordinating their spectrum allocations with other European countries and markets globally.

In 2007, the GSMA commissioned research firm RTT to study whether it is technically and commercially viable for device manufacturers to produce handsets tailored for individual European markets. This study found that vendors are reluctant to develop devices specifically for small markets, because this would divert effort from serving the larger markets, where most of their profit is generated.

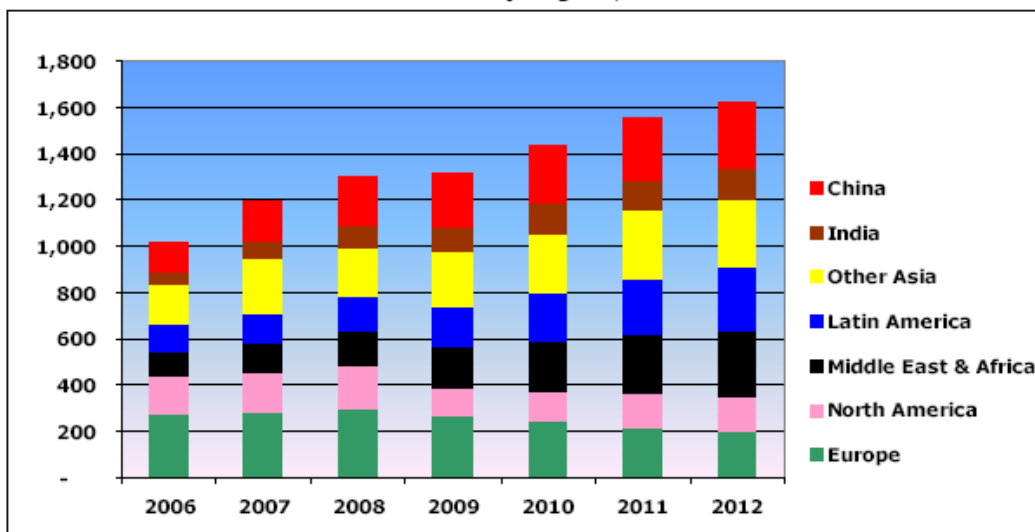
Some commentators have suggested that spectrum harmonisation can be achieved by adopting “half duplex” technology. A further RTT study, commissioned by the GSMA, concluded that even with “half duplex”, there is still a need for a precise frequency alignment for manufacturers to get the benefits of economies of scale.

Spectrum harmonisation is critical for the successful, cost effective, deployment of mobile broadband and for delivering new high-speed mobile broadband technologies, such as HSPA and LTE, into rural communities.

The second RTT study came to the following conclusions:

- If European countries fail to allocate the same spectrum and implement the same frequency band plan for advanced mobile broadband services, European users could end up paying a substantial premium for devices designed to use these services.
- Europe presently constitutes 24% of the global handset market by volume. By 2012, this share will have fallen to 12%. Even the larger European countries account for a very small percentage of the global market. For example, the UK today accounts for approximately 2% of the world market. By 2012 this will have reduced to 1%. See Figure 7+

Mobile handsets- unit sales by region, 2006 to 2012



- Manufacturers will find it difficult to justify developing handsets for individual European markets, particularly as Europe accounts for an increasingly small proportion of the global handset market.
- Handsets that have to be specially designed or adapted for smaller markets may be starved of engineering effort. There may be a smaller choice of handsets, handsets may be late to market and may be compromised both in terms of their cost, performance and end user functionality.
- For manufacturers, the opportunity cost associated with servicing a non-standard band is of the order of \$300 million dollars.
- To minimise handset costs, European countries should adopt the same band plans setting out which section of the spectrum band is used for uplink communication (from the handset to the base station) and which section is used for downlink communication (from the base station to the handset).
- The production of half-duplex handsets, which would be able to adapt to different band plans, specially for the European market is unlikely. Handset manufacturers contacted by RTT believe that implementing half duplex would require additional work at the standards level which could significantly delay the time to market for handsets.
- The consensus among the radio frequency (RF) component community, transceiver and handset vendors is that it would be hard to develop half-duplex handsets with cost and performance benefits that would realise an acceptable return on the research and development and production investment needed.
- The production of a 'universal handset' that could function across different band plans is unlikely to be realised within the next five to seven years.