

Developing a spectrum portfolio for mobile broadband

Follow Up Article to Digital Dividend Webinar

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By Lee Sanders, Senior Manager, Consulting, Analysys Mason

In our recent webinar, we discussed the potential for digital dividend spectrum to be used for mobile broadband services. Critically, this spectrum could provide a low frequency band for LTE in order to enable a cost effective rural roll-out of mobile broadband. There are two factors that drive the cost of roll-out – the number of base stations required to achieve the desired coverage, and the cost per site. Use of lower frequency bands enables coverage to be provided with fewer base stations compared to higher bands.

Given the recent surge in mobile data traffic, it is becoming increasingly important for mobile operators to develop a portfolio of spectrum holdings that will meet this demand both in urban and rural areas. The digital dividend is just one of three major spectrum awards that will be taking place over the next few years. The others are the “refarming” of the 900MHz band and the award of the 2.6GHz band.

900MHz band

900MHz has been the low frequency GSM band for well over a decade. However, given that the existing licences in many countries are nearing their end, and that mobile data traffic has recently begun to take off, the “refarming” of this band for UMTS/LTE is becoming increasingly important for mobile operators. Refarmed 900MHz spectrum, potentially in conjunction with digital dividend spectrum, could provide critical low frequencies for UMTS/LTE, complementing other higher frequency holdings (e.g. 2.1GHz and 2.6GHz). This would enable cost-efficient roll-out of mobile data services to rural areas and reliable in-building coverage.

Analysys Mason has worked with spectrum management authorities and operators on several issues regarding the 900MHz band:

- We conducted a study for Ofcom to assess the impact of liberalising existing 2G spectrum (for example, allowing it to be used to provide 3G services) and the potential options for liberalising 2G spectrum (for example, removing restrictions on existing licensees, or issuing new licences through an overlay auction).
- For the Dutch spectrum management authority, we undertook a detailed study of the decisions in other EU countries regarding what to do with GSM spectrum licences when they expire (e.g. whether to extend or reissue them, or liberalise the spectrum market further).
- We have also assisted mobile operators in calculating the value of 900MHz spectrum across a range of scenarios.

2.6GHz band

Whilst the digital dividend and the 900MHz band are important to provide rural and in-building coverage mobile broadband, the 2.6GHz band is prime spectrum to provide high speed services and capacity. LTE is likely to require $2 \times 20\text{MHz}$ channels in order to provide its highest speeds. The 2.6GHz band, with 190MHz of spectrum (of which up to 140MHz is paired), represents mobile operators' main opportunity to gain $2 \times 20\text{MHz}$. This band has recently been awarded in Norway [see [Sanity Reigns in Norway: 2.6GHz auction](#)] and Sweden [see [The outcome of the Swedish 2.6GHz auction suggests a lower boundary for spectrum prices](#)], and is due to be awarded in the majority of European states over the coming years.

Analysys Mason has expertise in helping spectrum management authorities design award processes for the 2.6GHz band and also assisting bidders in their preparation for 2.6GHz auctions:

- We advised Ofcom on the award options for the 2.6GHz bands. The recommendations covered the format of the award, spectrum packaging and the timing of the award.
- We provided technical advice to Ofcom on the feasibility of different FDD and TDD technologies coexisting in the 2.6GHz band and the potential impact of adjacent channel interference on the cost of roll-out.
- We are currently advising a European mobile operator to value 2.6GHz spectrum, to develop an auction strategy and then to prepare for the auction.

For more information regarding any of these issues, please contact Lee Sanders lee.sanders@analysysmason.com. Also, for more commentary on the digital dividend, please read our recent article [Spectrum optimisation is now time-critical for both operators and regulators](http://www.analysysmason.com/About-Us/News/Newsletter/Spectrum-optimisation-is-now-time-critical-for-both-operators-and-regulators/) [http://www.analysysmason.com/About-Us/News/Newsletter/Spectrum-optimisation-is-now-time-critical-for-both-operators-and-regulators/]

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