

## Enterprise FMC: New UK GSM Allocation Opens Door to Market Entrants

### Summary

#### Issue

The UK's OfCom has awarded provisional licenses for cellular spectrum within the 1781.7-1785MHz paired with 1876.7-1880MHz bands to 12 companies, following a sealed-envelope auction earlier in the year. The winners are British Telecom PLC, Colt Mobile Telecommunications Ltd, Cyberpress Ltd (Pipex), Cable & Wireless, FMS Solutions Ltd., Mapesbury Communications Ltd., O2 (UK) Ltd., Opal Telecom Ltd., PLDT (UK) Ltd, Shyam Telecom (UK) Ltd, Spring Mobil AB and Teleware PLC (Private Mobile Networks). What competitive impact will these new market entrants and services have on the established enterprise mobility landscape?

### Perspective

#### Current Perspective Text

A recent UK auction of low-power spectrum has essentially allowed 12 new cellular players to enter the enterprise mobility market. For the purposes of this analysis, we will address four key areas.

- 1). The nature and limitations of the spectrum on offer
- 2). The winners, potential applications and service models
- 3). The advantages campus GSM services wield over existing customer premise enterprise mobility systems
- 4). The scope and nature of the competitive threat

Firstly, the spectrum. This new, nationwide allocation sits at the top end of the GSM 1800 MHz band, a spectrum which was originally set aside as an interference buffer between DECT and GSM networks – the so-called 'guard band'. UK service providers have been lobbying for the liberalization of the guard band for some years, and this auction is evidence of the regulator's new hands-off stance towards the UK communications market. OfCom has awarded this spectrum on an application and technology-agnostic basis, with astonishingly few license usage terms and conditions. This means that the winners are free to use

the frequencies as they see fit, including hoarding them for speculative purposes (spectrum trading), or, indeed, doing nothing at all with them. Unlike previous spectrum allocations, OfCom has refrained from imposing a 'use-it-or-lose-it' clause, and the auction process essentially sought to award the frequencies to the highest aggregate bidder, as opposed to the standard 'beauty contest' or 'first-past-the-post' auction system that governed the last major round of cellular (3G) allocation in Europe. This has led to a wild differentiation in pricing. According to OfCom, the reserve price for a single license allocation of this spectrum was fixed at GBP 50,000. Several winners (notably Cable & Wireless and FMS Solutions) managed to attain one of the 12 available national licenses at a price just slightly above this reserve price, while others paid significantly more. Teleware paid GBP 1 million for its license of guard band spectrum. COLT topped the table, at just over GBP 1.5 million. Given this pricing differentiation, coupled with the lack of license usage obligations and roll-out deadlines, it is difficult to predict how urgently these new players will feel the need to deploy them. Some may choose to sit on them, for resale at some later date. However, the market assumes that many of the guard band winners will indeed put these frequencies to use, and the most likely application will be dedicated, GSM micro-networks.

Here's why. Unlike previous GSM spectrum allocations, which allowed mobile operators to build out proprietary macro cellular networks, the guard band is offered on a concurrent basis, which effectively means that the 15 available frequencies within this band will be shared between the 12 winners. To avoid interference, these service providers will be restricted to low-power, localized applications. Given all this, the most likely service model envisages micro, or 'campus' environments, using picocells and other low-power cellular base stations for cheap mobile zone calling – and, indeed, this is the business model which winners such as COLT, Cable & Wireless and others have confirmed interest in pursuing. The concept of picocell GSM networks is still relatively new in Europe, although zone or 'bespoke GSM network' deployments are frequently used to create spot coverage in remote nooks and crannies beyond the reach of standard GSM networks, such as tunnels, ships, basement shopping malls and underground networks. In the past, mobile operators have also looked into GSM base-stations (including repeater and distributed antenna systems [DAS] technology) to strengthen or recreate the mobile signal within offices, particularly steel-reinforced buildings, in which poor GSM signal strength has led to a particularly unsatisfactory end-user experience. For especially large and important corporate customers, mobile operators have even been known to deploy an entire GSM cell within a corporate premise (at a cost of around GBP 25,000 to 35,000 a throw) to correct the problem. In comparison to other cellular local antenna installations (particularly DAS and GSM repeaters), picocells are relatively easy to deploy, with little significant building fabric disruption. Although picocell pricing is still relatively high, most in the industry believe the emergence of 12 new UK buyers for picocell equipment will help depreciate pricing levels which better approximate and compete with WLAN hub pricing. In the immediate

term, however, picocell base stations pricing levels make a mass market, residential sector service strategy an unlikely prospect. The enterprise sector appears to be the prime target of the new players, and looking at the winning rostrum, that's hardly a surprise.

#### Spectrum Winners:

Provider	Heritage	Currently Targets	Existing capabilities	Statement regarding plans for new spectrum allocation
<b>BT PLC</b>	Part of BT PLC	All sectors, residential to MNC	Wide portfolio of both business and residential telecommunications services.	Undisclosed
<b>Cable &amp; Wireless Ltd</b>	Cable & Wireless	Large UK-based enterprises	Managed IP services	Will provision integrated fixed-to-mobile and FMC solutions to existing business customer base.
<b>Cyberpress Ltd.</b>	Wholly owned by Pipex	Residential and business sectors	Managed VPN, Dedicated Access, Business Broadband, Public Sector Solutions	Looking to provision campus GSM Picocell services to enterprise community initially.
<b>COLT Mobile Telecoms Ltd.</b>	COLT Telecoms	SMEs and large corporates	Wide portfolio of business telecommunications services	Looking to provision campus GSM Picocell services to core enterprise customer base.
<b>FMS Solutions Ltd</b>	Privately-held company	SMEs	Managed communications provider	Plans to offer bespoke GSM networks in remote areas, tunnels, railways etc.
<b>Mapesbury Communications Ltd</b>	MCom	SMEs to large corporates	WiFi and WiMax deployments, for enterprises campus and city deployments	Undisclosed
<b>O2 (UK) Ltd</b>	Part of O2 Group, held by Telefonica	Residential to Large Corporate	Wireless services	Undisclosed
<b>Opal Telecom Ltd</b>	Owned by Carphone Warehouse Ltd	SMEs	Managed telecom solutions, fixed and mobile	Undisclosed
<b>PLTD (UK) Ltd</b>	Wholly-owned subsidiary of Philippine Long-Distance Telephone Company (PLTD).	Residential and SMEs	Wholesale carrier, retail prepaid calling cards to Filipino consumer and business community abroad.	Undisclosed
<b>Shyam Telecom (UK) Ltd</b>	Part of India-based wireless infrastructure manufacturer.	Service providers and SMEs	Makes indoor and outdoor DAS equipment and customized network coverage solutions (for basements, tunnels, rural outposts, airports etc).	Undisclosed
<b>Spring Mobil AB</b>	Swedish-based Enterprise GSM	SMEs and large corporates (350	Dedicated GSM networks using	Will leverage new spectrum allocation

	services provider, launched in 2005 in Sweden.	customers in Sweden).	picocells in Sweden. Looking to bring the same business model to UK.	to offer provision campus GSM services.
<b>Teleware PLC</b>	Bid, and will provide services to enterprises as Private Mobile Networks (PMN).	Large corporate customers (500 customers to date, of which 25% of which are FTSE 100).	PBX software, GSM softswitch services for Personal Numbering, Unified Messaging IP Telephony	Campus GSM services in tandem with existing PBX solutions, remote GSM network deployments (oil rigs, desert operations etc).

In theory, these spectrum allocations can be used for any technology or application deployment. In researching this report, however, we undertook an interview poll of the new guard band spectrum winners to find out what they intended to do with their new frequencies. Of those willing to disclose future strategy, five companies (Cable & Wireless, COLT, Teleware, Cyberpress and Spring Mobil) confirmed plans to execute on a GSM campus/picocell service strategy targeting the enterprise with a range of FMC, substitution and PBX complement applications.

The business models, however, are likely to demonstrate a wide variance in the short-term. Swedish-based Spring Mobil will look to replicate its fixed-mobile substitution (FMS) service in the UK for an 'all-mobile' enterprise communications offer, which attempts to encourage enterprises to 'cut the cord' and cancel their standard fixed line subscriptions. Like mobile operators' mobile VPN services, Spring Mobil claims to be able to offer familiar, PBX-style call management features from a mobile handset. PMN (Teleware Plc), on the other hand, envisages linking picocell GSM networks to standard PBXs, and deploying GSM gateways within the firewall for least-cost-routing mobility, with a view to embellishing this with unified communications applications in the mid-term. Alternatively, Cable & Wireless and COLT have both confirmed a FMC vision, could see picocells deployed as an alternative to WLAN hubs for 'GSM hotspots' within the office zone, bundled, or even interconnected with the providers' existing access and communications portfolio.

Could campus GSM become a challenger to existing FMC service models? Potentially, yes. Like WLAN campus scenarios, GSM hotspots seek to create the same kind of localized dedicated network environment for both voice and data traffic but unlike WLAN/GSM FMC systems, GSM picocells are compatible with the vast majority of GSM handsets currently in use. Whereas FMC players such as BT, France Telecom and others are being held up in their execution of FMC services by the dearth of available dual-mode handsets, an ip access picocell captures standard GSM traffic as it enters the designated zone, and pushes it over IP for a low-cost mobility proposition which mirrors the spirit (if not the technology) of existing services such as BT's Fusion. At a recent EUVA Mobilising the Enterprise summit, MNC end-user representatives pointed to the cost of procuring and deploying this new generation of WLAN/GSM dual-band handsets as a key disincentive to FMC service deployments. In a nutshell,

picocell GSM networks allow these new market entrants to provision FMC services using the established, standardized and universally accepted GSM protocol, along with legacy handsets.

Naturally, this service model has weaknesses. Although the spectrum allocations are national, the concurrent nature of the license terms, as outlined above, pretty much rules out wide-area macro network deployments. A service provider could, in theory, roll out a national, wide-area network of hundreds and thousands of picocells, but this is a nonsense scenario from both a cost and interference perspective. These new market entrants will be able to offer localized GSM coverage only in the short term. In the longer, term, they may look to complement the local area GSM offering with a wide-area GSM MVNO or equivalent reseller agreement with one of the main GSM mobile operators. BT already has one, with Vodafone UK. For the others, such an agreement could take time to realize. Competitors should note that aggregators such as iPass and Fiberlink have been attempting to strike MNVO and reseller agreements with European mobile operators to allow their own customers wide-area cellular access services for several years, with limited success. Mobile operators are wary of business sector competition, and although fixed operators like to argue that mobile operators are not interested in targeting this space, that's not quite as true as it used to be. Furthermore, even within the local area, picocell GSM network deployments face technical restrictions. Picocell provider ip.access is currently leading the field in the provision of GSM base stations, yet these picocells are limited to just seven simultaneous calls at any one time. Naturally, service providers will be able to ramp this up with additional picocell points, but, as any spectrum manager knows, such strategies run into difficulties in terms of channel management and picocell location logistics. Still, the 'GSM Hotspot' idea is currently being touted as the most likely deployment for this spectrum, and for this reason, we suggest the main thrust of the competitive challenge will be felt in the SME sector.

Which set of competitors will these new players challenge? The threat is relative to the service model. Pure mobile-only FMS players such as Spring Mobil will certainly be seen as a threat to mobile operators with a strong mobile VPN focus, notably, Vodafone, T-Mobile and Orange UK. Equally, would-be FMC service providers such as COLT and Cable & Wireless will threaten anyone with an enterprise FMC strategy in the pipeline – notably BT, but also Vodafone (again) and Orange (again) as these two wireless operators look to evolve their own FMS strategies to a new, fixed-mobile converged, level. The ability to offer 'GSM hotspot' services, both indoors and outdoors in campus environments, will also allow these new market entrants a differentiation against campus WLAN systems providers, as well as enterprise telephony providers looking to evolve PBX functionality out to the mobile worker.

How short-term is this threat? Technically, OfCom issued the spectrum allowance from May 1, and at least one player, PMN, has already launched a service for the deployment of PBX-complementary GSM networks in the office

environment, using picocells. Providers such as Spring Mobil are also keen to get an early start in the market. In one clause of the license agreement, OfCom has bound all 12 guard band spectrum winners to come up with a unilaterally agreed set of rules, a 'Code of Practice', within six months to offset potential interference issues (or OfCom will impose one for them). Even in small, localized GSM deployments, interference between picocell outdoor cells, or GSM base stations deployed in large blocks of closely-packed offices, could lead to interference issues. The Code of Practice seeks to establish a frequency database and working procedure to allow the new market entrants to peacefully resolve these interference problems as, and when, they arise. However, there is nothing in the license terms which obliges the new market entrants to hold off on launching service before the establishment of this Code of Practice.

Certainly, the business case for enterprise GSM hotspot services is waiting to be proven. As with all FMC services in the pipeline, time, technology and end-user preferences will dictate the opportunity for the budding group of providers in the enterprise mobility ecosystem.

### **Recommended Actions**

#### Vendor Actions

- BT should deploy its new spectrum allocation to provision indoor GSM hotspots for SMEs, alongside its MVNO agreement with Vodafone. Such a service could be positioned as a simpler and cheaper alternative to the BT Fusion (FMC) product for the small to mid-sized business sectors. The business case for UMA-based services in the enterprise market has yet to be established. GSM hotspots represent a simpler, and potentially less risky, platform from which to test out the FMC service delivery concepts.
- New spectrum winners should put together a series of strong arguments to persuade mobile operator to open up their wide-area GSM networks. Winners looking to target the large corporate and MNC community would do well to approach smaller UK network operators, such as T-Mobile UK, which have fewer target customer cannibalization issues.
- Cable & Wireless should consider working together with iPass to evolve its iPassConnect-based RAS product to Campus GSM. Cable & Wireless should find iPass open to, and interested, in a working agreement in which the aggregator could also take advantage of the newly allocated spectrum.
- Mobile operators such as Vodafone UK and Orange UK will now need to address a perceived weakness in their ability to offer high quality and resilient indoor GSM services, which is a key incentive to Mobile VPN sales. These operators should note that guard band spectrum winner O2 will almost certainly look to make GSM campus services a unique differentiation within its SME-

targeted mobile services portfolio.

- Guard band spectrum winners should put together a ROI model to prove that GSM campus services offer a cheaper and quicker-to-deploy service model as against WLAN/GSM FMC services in the pipeline. The spectrum winners should focus on the relatively high end-user cost of replacing legacy, and perfectly functioning, GSM phones with high-cost dual mode WLAN handsets implicit in the standard WLAN-enabled FMC scenario.
- T-Mobile UK is a likely MVNO partner for these new guard band spectrum winners (see second bullet), but the mobile operator should take time to pick the right candidate to share its wide-area GSM network. T-Mobile UK should consider partnering with one of the managed enterprise telephony specialists targeting large corporates, such as Teleware, as this represents a low cannibalization threat to its core business service strategy.

#### User Actions

- Enterprises looking to create campus communications solutions should now be aware of a number of different technological alternatives available. Although the industry tends to define FMC in BT's pioneering UMA model terms, GSM base stations may be able to achieve a similar cost-saving with attractive ROI models.
- MNCs looking to strengthen a GSM signal within a building complex should be aware that mobile operators have been offering solutions and services to correct the in-building cellular problem for some time. End-users should also be aware of that the UK's mobile operators will be able to offer wide-area GSM, besides campus GSM coverage.
- End-users should look for scalability promises from GSM campus service providers up front. Although picocells can, in theory, be aggregated to allow for larger simultaneous call quotas, there are channel management issues involved with this. End-users should seek to understand the cost and resource implication of managing multiple picocells for large user number deployments.

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