

Mr C. Mason
Ofcom
Riverside House
2A Southwark Bridge Road
London SE1 9HA

24th Nov 2016

Dear Mr Mason,

Ofcom's policy for the DECT guard band - a consultation document.

FMS Solutions is pleased to have received the consultation document regarding the DECT guard band and makes the following comments as requested:-

Question 1: *In the light of the complexities of the transition, do you have views on the relative value of a 2x5 MHz block as opposed to a 2x3.3 MHz block for high power mobile use?*

FMS Solutions makes the assumption that the DECT guard band should accommodate LTE.

The 2x3.3 MHz block supports the 3 MHz flavour of LTE which offers 15% of the full LTE downlink data throughput. In contrast, the 2x5 MHz offers 24%, or between 18 and 37 Mb/s.

The Government's aim is to provide superfast broadband (speeds of 24Mbps or more) for at least 95% of UK premises. The 2x5 MHz block supports the Government's aim, the 2x3.2 MHz block does not.

Regarding the complexity of reconfiguring the MNO's 1800 MHz spectrum, it would not be the first time as there have been several spectrum reconfiguration programs carried out in the past. Also, now that the MNO's self-manage their spectrum allocations, they are more accustomed to making such changes.

FMS Solutions takes the view that provision of a 2x5 MHz block would enable the CSA's to offer products and services in line with the Government superfast broadband initiative.

Question 2: *Are there any other developments, in the UK or in Europe, relevant to our policy in this band that we should be aware of? In particular, are there other potential applications that could be deployed in the band under*

a low power shared access regime? It would also be helpful to receive any updates from the current CSA licensees on their plans.

There will be rural parts of the UK that the MNO's are unlikely ever to provide services, but where the low cost infrastructure available to the CSA's make acceptable business cases.

FMS Solutions expects to offer a self-provision mobile phone coverage solution in areas of no current or planned MNO coverage. The solution makes use of the unique technology that supports a GSM and an LTE carrier in the same frequency block. It is marketed to those who wish to solve their own coverage shortfall.

FMS Solutions will also continue to grow its private GSM solution that can be either stand-alone or as extensions to existing pbx installations. This will evolve into GSM plus LTE.

Question 3: *Do you agree with this preliminary view that we should not trigger a change from a low power shared regime to a high power single user regime at this point?*

FMS Solutions agrees with this preliminary view for the following reasons:-

- 3.1 BT (EE+Og), Telefonica (O₂) and Vodafone (C&W) have made no efforts to use their current low power licenses that on the face of it offer a useful solution to indoor schemes. This suggests that the MNO's see little value in the additional low power spectrum.
- 3.2 If the DECT guard band is offered up through auction for high power use then presumably other organisations may wish to bid e.g. Arqiva, Network Rail or Talk-Talk. This creates the possibility of a new national MNO, albeit with limited capacity, entering the market for a fraction of the fees paid by the existing MNO's.
- 3.3 The potential five plus years delay would be akin to planners blight where the CSA's business's enter no-mans land with little prospect of survival.

Question 4: *Do you think that the stations could be deployed in the DECT guard band without material interference risks or need for coordination? If so, do you have a view on the conditions for exemption such as power limits, indoor/outdoor use or others?*

FMS Solutions has its roots in cellular engineering where the size of a cellular network is ultimately limited by self-generated interference, hence the value of frequency or code planning.

The "un-wrap and fit" approach in the WiFi and DECT worlds has resulted in interference limited local networks where the common fix is to add yet more devices. FMS Solutions has been able to provide a quality GSM based alternative based on sound radio engineering principles.

On the cellular side of the spectral boundary, the CSA's must behave like a cellular Operator, demonstrating radio knowledge by managing spectrum and coordinating with other Operators, otherwise there is little credibility in discussions with the MNO's.

The existing Mobile 200 Group Code of Practice does however recognise that the deployment of femto-cells need not be coordinated and as such are limited in power to <2mW and given exclusive use of the two outer channels. This would also permit the development of short range radio devices operating in part of the DECT guard band.

FMS Solutions believes that the coordination regime provided by the Mobile 200 Group has worked well, can continue to work well, and encourages a base level of technical competence amongst the CSA's.

Question 5: *Are there technology developments, such as polite protocols, that would facilitate coexistence of stations in the band?*

Undoubtedly there are base station management systems that permit automatic configuration by reference to what is already present. Many related techniques have been used in the cellular world e.g. frequency hopping that can be adopted into the low power world.

As with all such automatic systems, they work well up until about 80% of the available capacity has been used up. Beyond this point there is a risk that so many automatic systems will conflict with each other that the customer experience will start to disappoint.

FMS Solutions believes that whilst in the short term polite protocols would facilitate coexistence of stations in the band, they are of limited help when the band fills up and therefore should not be relied on.

Question 6: *Do you think it would be possible to coordinate deployments if the number of licences was higher than twelve, potentially unlimited?*

FMS Solutions believes that the Code of Practice developed, managed and operated by the Mobile 200 Group has worked well and to the benefit of its members. There is no reason in principle why additional licensees cannot be accommodated by the regime, indeed the existing CSA's would probably welcome new members as opposed to them being feral.

The Code of Practice was developed by the Mobile 200 Group as a licensing condition and required unanimous agreement by the membership. Assuming the membership grew then the governance of the Group may require new rules, sanctioned by Ofcom.

Question 7: *Do you think it would be possible to have different coordination procedures for different types of use?*

FMS Solutions agrees with the Ofcom observations.

There is an acknowledgment in the existing Code of Practice of two deployment situations where coordination is not required:-

- 7.1 Extra low power femto-cells can be deployed outside of the Code of Practice database providing they are below <2mW and occupy channels 1 or 16 at the DECT guard band edges.
- 7.2 The maximum transmit power can be increased to 1Watt if the area covered is within the domain of one landlord. The cell is still placed on the database to allow for possible future coordination, but the increased power level is not noted.

FMS Solutions is of the opinion that coordination is a beneficial activity but is comfortable with the concept of the low power femto-cell remains exempt from the Code of Practice database. This would permit the development of short range radio devices operating in part of the DECT guard band.

Question 8: *What do you think would be the most appropriate authorisation approach regime in a low power shared access regime for this spectrum (and why)?*

FMS Solutions agrees with the Ofcom view that a light-licensing approach to authorisation is the preferable option.

FMS Solutions firmly believes that some knowledge of radio engineering is required for the efficient use of the spectrum and that is best encouraged by light-licensing.

When the spectrum is lightly populated, innovation proceeds in the protocol and applications arena i.e. the radio link is considered as a transport mechanism. As the spectrum begins to fill up then the original choice of radio interface may prove to be less than optimum and consequently there is a premature demand for more spectrum. An example is the uncoordinated use of WiFi where the emphasis is on the application, and the radio path somehow takes care of itself. The result has been unbalanced occupancy of the spectrum, almost no radio expertise to re-balance it and a consequential demand for more spectrum.

The cellular world is always struggling for capacity, the engineering of which has resulted in very efficient spectrum occupancy. Assuming that the DECT guard band attracts a lot of traffic, its efficient use will be through radio engineering and that implies coordination which is not what you get from license exemption.

Question 9: *Do you have comments on the choice of approach to setting fees under each of the options for licensing low power shared access to the DECT guard band?*

The choices for setting fees proposed by Ofcom are:-

9.1 The opportunity cost - based on the highest value usage - presumably the additional spectrum being offered to the MNO's who know their £'s/MHz income and can immediately use the capacity. This would most easily apply to BT(EE) who could incorporate it into their adjacent frequency band. Correspondingly it would be less attractive to the other MNO's, being an isolated 3.2MHz, too small to do anything with other than special coverage schemes that they (BT, Telefonica and Vodafone) could do today as CSA's, and have obviously chosen not to do so. The cost of re-configuring the 1800MHz band would also be a factor.

Why then would BT, or Telefonica or Vodafone pay a large sum for something they already have and don't use?

The alternative is that a new MNO comes into the market with national coverage, albeit with low capacity, for only £4m - a fraction of the fees paid by the current MNO's. But again, why would a new entrant value the spectrum more than the current MNO's would - its just ebay principles.

FMS Solutions rejects the Ofcom proposal that the opportunity cost for the DECT guard band is £4m and therefore how it could be applied to the CSA's is not relevant.

9.2 A uniform fee in the order of hundreds of thousands of pounds - assuming an annual fee of say £400k then it requires a turnover of say

£8m to support it and none of the current CSA's are seeing this level of DECT guard band business, and FMS Solutions doubts that there are many business models that can generate this level of turnover within the first 12 months.

FMS Solutions does however see potential value in the uniform fee concept providing the opportunity cost is more realistic in the first place.

- 9.3 A per base station fee - the Ofcom proposal is for a fixed component to discourage dormant usage and contribute to say the Mobile 200 Group and the Code of Practice, plus a variable component based on the number of BTS's deployed.

Whilst FMS Solutions believes that the fixed component concept has value, the only way of reliably charging a per base station fee is retrospectively as per HMRC.

Also the per base station fee does not take into account money earned over successive years from the established base stations, So a CSA could build up a portfolio of say 10,000 base stations and then choose to stop further growth and live off the ongoing revenue which was not then "taxed" by Ofcom.

- 9.4 The tiered approach would obviously encourage innovation and new entrants, effectively deferring spectrum access fees until the business was established and could afford the higher level. Clearly the challenge is setting the level, or maybe levels.

FMS Solutions tentatively supports this approach dependant on the threshold(s) proposed.

- 9.5 A cost based fee based on the costs to Ofcom of managing the band. This presumably would be a modest fixed fee per licensee - a clearly attractive model to the CSA's. However, as the consultation document says in section 5.37 "...the users would not have visibility of the opportunity cost.....and neither would Ofcom have visibility of the value users attach to their use - and hence it could result in inefficient use of the spectrum."

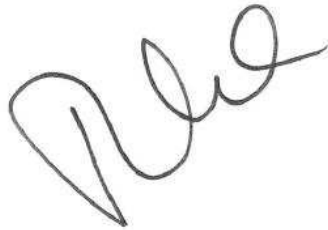
The DECT guard band was made available 10 years ago to encourage products and services innovation in the mobile phone arena. There was no immediate technology and it has taken time for innovative technology to mature to the point where it can deliver real services. As with all start-up companies there is an associated exit plan that in many cases amounts to demonstrate something new, desirable and stable and then selling the business or IPR to a bigger organisation already in the business e.g. an Ericsson or MNO.

FMS Solutions suggests that the DECT guard band could be considered as an incubator for new businesses in the mobile phone world. As such, the opportunity costs seen by the start-up are finally realised by the bigger organisation that acquires the new IPR, and consequently should not be a burden on the start-up.

FMS Solutions consequently favours the cost based fee approach.

FMS Solutions is willing to participate further in the consultation and looks forward to Ofcom's considerations.

Your sincerely,

A handwritten signature in black ink, appearing to read 'RW', is centered on the page.

Roger Wilkins, Director