



Keith Gibbins
Spectrum Policy Group
OFCOM
Riverside House 2A Southwark Bridge Road
London SE1 9HA

Ulrich Rehfuess
T&I IE
Nokia Solutions and
Networks Management
International GmbH
St.-Martin-Str. 76
81541 Munich
Germany

Phone +49 (89) 5159-23877
Fax +49 (89) 5159-44-23877
<mailto:ulrich.rehfuess@nsn.com>
nsn.com/governmentrelations

Your reference:
Our reference: UR
27. November 2013

Response to OFCOM Consultation; 2.3 and 3.4 GHz spectrum award

NSN is grateful for the opportunity to contribute to the UK discussion on the two bands which are very important for additional capacity and future growth of Mobile Broadband.

2.3 GHz is an IMT band located between the 2.1 GHz and the 2.6 GHz bands and thus is ideally suited to complement existing and evolving Mobile Broadband networks from their respective base station footprints. The band will deliver extra capacity, primarily in downlink direction, in densely populated areas. We welcome OFCOM's consideration not to apply coverage obligations to the 2.3 GHz band as the band is best used for demand driven capacity extensions.

While LTE and LTE-Advanced scale in 5 MHz blocks, we suggest considering 10 MHz block size for licences in the 2.3 GHz band as 5 MHz blocks could lead to more fragmentation and single 5 MHz TDD blocks might not represent significant additions of capacity, for example, to a 2.6 GHz 2x20 MHz FDD network.

3GPP has defined LTE TDD Band 40 to address the entire band from 2300 MHz to 2400 MHz which also applies to the 40 MHz block proposed for assignment. TDD with its possible asymmetries in downlink and uplink is well suited to address the increasing traffic asymmetries in Mobile Broadband networks. As OFCOM correctly states in the consultation, the band is in commercial use in various countries around the globe with LTE TDD Band 40 systems. As one example, Optus in Australia complements their existing FDD systems with Band 40 with a choice of smart phones incorporating multi-mode FDD and TDD operation as well as the support for the respective band combinations.

NSN recommends exclusively assigning the spectrum to mobile operators. We see clear advantages for exclusive licensing of spectrum to mobile operators as this provides the best possible predictability of spectrum use which is required for network investment and for providing predictable Quality of Service. NSN has proposed Authorised Shared Access (ASA), framed within Licensed Shared Access (LSA) in CEPT, in cases where incumbent use would prevent such exclusive licensing. As several EU member states have such incumbent use, we see ASA as a means to provide operators with conditions similar to exclusive licensing while the incumbent spectrum users retain control over the spectrum for their purposes.

With the progress in CEPT FM 52 and 53, we see ASA as a viable tool to open large parts of the 2.3 GHz band across CEPT. We expect the UK to indirectly benefit from ASA in other European countries as this will further push the device ecosystem. In UK, ASA may be considered to open additional resources in the 2.3 GHz band beyond the current 40 MHz.



3.5 GHz is also an IMT band providing very large RF bandwidths for future capacity needs. Due to the higher carrier frequency and consequently more coverage challenges, the band is expected to deliver its prime benefits in areas with very high traffic demand such as business districts, shopping or leisure areas. Again, coverage obligations are not required from our point of view as capacity build out should rather be based on actual demand.

Like OFCOM, NSN sees strong preference for the TDD option Band 42 for 3400—3600 MHz globally and in Europe, while support for the FDD option Band 22 is limited. As a capacity overlay, TDD is better suited to adapt to asymmetries in traffic. In the 3.5 GHz band, total bandwidth available is sufficient to offer 20 MHz blocks at least in parts of the band to allow for large contiguous blocks of spectrum with least fragmentation and best possible performance.

In this respect, the defragmentation of the band by shifting the UK Broadband assignment towards the upper edge of the band is seen as beneficial. Also for 3.5 GHz NSN proposes to licence the band exclusively for the reason stated above. Unlike 2.3 GHz, we expect exclusive licensing to happen across Europe without the need of ASA.

Auction Timing

In the interest of providing clarity to the industry (for example standardization of TDD+FDD carrier aggregation) it would be desirable for the 2.3 GHz spectrum to be made available as soon as possible.

As the terminal and infrastructure ecosystem for the 2.3 GHz band is already well established and networks could be deployed immediately following the granting of licenses, we see no reason to delay the auction of the 2.3 GHz band should there be any issues with the 3.5 GHz allocation and auction.

As an equipment manufacturer, NSN does not intend to apply for any spectrum in the bands under discussion. Consequently, NSN in the following comments are responding to questions 1 to 3 and 14 only

Question 1: Do you agree with our proposal to award the 3.4 GHz band in a way that is consistent with an unpaired (TDD-compatible) band plan only, and to make this decision sooner rather than later? If not, please set out your reasons and any evidence for your view.

NSN agrees with OFCOM's proposal. In the interest of harmonised bands to maximize economies of scale and roaming capabilities, NSN favours TDD (3GPP Band 42) over FDD (3GPP Band 22) for the 3.5 GHz band and welcomes guidance from leading administrations in that direction.

Question 2: Do you agree with our proposal to vary UK Broadband's licence so that it encompasses the frequencies 3560-3600 MHz instead of 3480-3500 and 3580-3600 MHz?

NSN fully agrees with OFCOM's reasoning of the proposal as it provides technical advantages to minimise the inter operator boundaries within the band as correctly outlined in OFCOM's considerations. While LTE Advanced intra-band carrier aggregation does not exclusively rely on contiguous spectrum assignments, many implementation and operations aspects of networks benefit from contiguous assignments.

Question 3: Do you have any specific interest in the 3560-3580 MHz block in preference to any other 20 MHz block within the available 150MHz? If so please give your reasons and any supporting evidence.



NSN as an equipment manufacturer has no interest in owning spectrum assignments, but would like to state the point that typically lower carrier frequencies are slightly preferred over higher carrier frequencies due to slightly better propagation properties. Consequently, we do not expect anyone having specific requirements to get the upper-most 20 MHz block of the available spectrum.

Question 4: Do you have any specific interest in acquiring a licence to use frequencies in either or both of the bands to be awarded?

No

Question 5: How much spectrum would you be interested in acquiring? (What is the minimum and maximum amount of spectrum of interest to you?)

n.a.

Question 6: Which of the two bands would you be interested in: 2.3 GHz, 3.4 GHz or both?

n.a.

Question 7: Are there specific parts of the bands you are interested in and if so what are they?

n.a.

Question 8: What do you envisage using the spectrum for (e.g. 4G services or other applications)?

n.a.

Question 9: Where would you expect to use the spectrum (Great Britain-wide or in specific geographical areas)?

n.a.

Question 10: What types of device would you want to use the spectrum for, and when would they be available?

n.a.

Question 11: When would you expect to make use of the spectrum?

n.a.

Question 12: Do you have any comments on the method of award, such as combinatorial clock auction?

n.a.

Question 13: Do you have any comments on whether a cap on the amount of spectrum that could be acquired through this award would be appropriate?

n.a.



Question 14: Do you have any preference for spectrum packaging, for example block size?

From a manufacturer's point of view, NSN proposes the consideration of block sizes larger than 5 MHz to prevent band fragmentation and to offer the bandwidth required as meaningful capacity additions to existing Mobile Broadband networks likely operating on 2x20 MHz FDD or more. The amount of spectrum in 2.3 GHz would allow the consideration of 10 MHz blocks, in 3.5 GHz possibly even 20 MHz blocks.