UK Broadband's Response to Ofcom's consultation on competition issues and auction regulations in relation to the award of the 2.3 and 3.4 GHz spectrum bands

Executive Summary

UK Broadband Limited ("UKB") welcomes the opportunity to comment on Ofcom's consultation.

The outcome of this auction of 2.3 and 3.4 GHz spectrum will be hugely significant for competition in the market in the short to medium term as it is likely to be the only opportunity to acquire, deploy and utilize new mobile spectrum for at least three years[1].

Ofcom has a duty to assess and address the impact that the continued accumulation of a disproportionately large share of *all relevant mobile spectrum* by one of more players would have on competition in the market. This should be its primary concern in relation to this auction. We concur with the view expressed by Ofcom in its 2014 consultation[2] that this assessment should include 800 MHz, 900 MHz, 1.4 GHz, 1.8 GHz, 2.1 GHz (paired only), 2.3 GHz, 2.6 GHz and 3.4 GHz and exclude 3.6-3.8 GHz and 700 MHz spectrum. We do not believe there have been any developments since 2014 that should alter that conclusion.

We do not agree with the distinction drawn between spectrum which is immediately useable and that which is not. We think that 3.4 GHz spectrum is already of strategic importance to the market, having been identified by the RSPG as a primary band suitable for the introduction of 5G services and being harmonized for mobile use across Europe.

Ofcom should not rely on future auctions of 700 MHz or 3.6-3.8 GHz spectrum to remedy competitive problems which result from the outcome of this auction.

We therefore do not agree that Ofcom should consider Options A and B as potential measures to address competitive concerns. Option C should only be considered if 700 MHz spectrum is excluded from the overall total.

UKB considers that Option E (a 30% cap on mobile spectrum holdings, including 2.3 and 3.4 GHz but excluding 700 MHz and 3.6 GHz spectrum) is the most effective way to address the competition concerns raised by the auction.

---

[1] Noting the co-existence issues that need to be dealt with in the 3.6-3.8 GHz band before it can be used at scale.

[2] https://www.ofcom.org.uk/__data/assets/pdf_file/0025/78055/Public_Sector_Spectrum_Release_2-3_and_3-4_ghz_award.pdf, paragraph 7.66

5th Floor, 236 Gray's Inn Road, London, WC1X 8HB
+44 (0)20 3006 7801 ukbroadband.com

Question 1: Do you agree that we have identified the right competition concerns?

Ofcom has identified two competition concerns. These concerns are:

- The likelihood of very asymmetric mobile spectrum shares weakening competition even if there remain four credible MNOs ("Competition Concern 1"); and
- The likelihood of there ceasing to be four credible MNOs as a result of the auction ("Competition Concern 2")

Ofcom's primary concern should be the risk of market distortion arising from the accumulation of a disproportionately large share of spectrum in the hands of one of more players. Such asymmetry has the effect of crowding out not only smaller players but also prospective new entrants, which in turn can stifle innovation in products and services.

Ofcom expresses the view that the market is "working well", despite BT/EE holding a more than 40% share of spectrum. We do not share this view. Annex 7 of the consultation document shows that, having decreased continuously until 2014, increase in household spending on mobile began to increase in 2015.

Annex 7 also references a 2016 report on Mobile Broadband Prices in Europe commissioned by the European Commission which found that, compared with 2015, prices of UK handset plans have increased by an average of 4% between 2015 and 2016 compared with a 7% decrease on average across EU member countries.

MNOs are struggling to meet ever-growing consumer demands and expectations for the provision of fast data services. And yet the two larger MNOs have yet to deploy all of their spectrum[3].

We believe that competition is already beginning to suffer from the extreme imbalance of spectrum holdings in the UK market and the competitive environment will deteriorate further as a result of the auction if adequate competition measures are not imposed.

Question 2: Do you agree with our assessment and provisional conclusions in respect to:

Competition Concern 1 (the risk of very asymmetric spectrum shares and in particular Competition Concerns 1(i), 1(ii), and 1(iii)).

Ofcom has considered the following potential outcomes of the auction:

- Competition Concern 1(i): very asymmetric *overall* spectrum shares
- Competition Concern 1(ii): asymmetry in mobile spectrum which is useable

[3] See paragraphs 5.37 and 5.60 of the consultation document

immediately after the award

- Competition Concern 1(iii): asymmetry in 3.4 GHz spectrum

We disagree with Ofcom's conclusion in paragraph 4.54 that there is little cause for concern about competition being weakened due to the distribution of overall spectrum holdings immediately after this auction (Competition Concern 1(i)). We think that this should be Ofcom's primary concern.

In UKB's view, no convincing grounds have been presented for giving Competition Concern 1(ii) more weight than Competition Concern 1(i). We explain our reasons below.

Whilst we think that it is reasonable to take some account of Competition Concern 1(iii) – the possibility of asymmetry in the 3.4 GHz band – we think this concern should be secondary to Competition Concern 1(i) – the risk of asymmetry in shares of mobile spectrum overall.

In UKB's view, the potential outcomes that Ofcom should be most concerned with in its competition assessment are those set out in Figure 4.1:

Figure 4.1: Spectrum shares if MNOs win all/no additional spectrum[31]

	BT/EE	Vodafone	O2	H3G	UK B
BT/EE wins all 2.3 GHz & 3.4 GHz spectrum	**53%**	21%	10%	11%	5%
Vodafone wins all 2.3 GHz & 3.4 GHz spectrum	30%	**44%**	10%	11%	5%
O2 wins all 2.3 GHz & 3.4 GHz spectrum	30%	21%	**33%**	11%	5%
H3G wins all 2.3 GHz & 3.4 GHz spectrum	30%	21%	10%	**33%**	5%

[31] This table shows the possible holdings when the following bands are included 800 MHz, 900 MHz, 1400 MHz, 1800 MHz, 2.1 GHz, 2.3 GHz, 2.6 GHz (paired and unpaired) and 3.4 GHz spectrum. This table excludes the 700 MHz and 3.6-3.8 GHz spectrum.

This table rightly excludes the 700 MHz and 3.6 – 3.8 GHz spectrum, for the reasons set out below.

We do not agree with Ofcom's assessment of the importance of Competition Concern 1(i) for the following reasons:

1) The relevance of the immediate "useability" of 3.4 GHz and 1.4 GHz spectrum

In strategic and competitive terms, failure on the part of one of the smaller MNOs to acquire any 2.3 GHz or 3.4 GHz spectrum would be likely to pose a significant threat to their ability to compete in the market from 2018 onwards and could potentially discourage further network investment.

During the four year period since the Ministry of Defence first announced it would release this spectrum for award, due to the availability of devices and perceived propagation advantages, the 2.3 GHz spectrum has generally been regarded as the more desirable of the two bands being released in the PSSR award. However, the 3.4 GHz spectrum is

about to come of age. Indeed, now that 3.4-3.8 GHz has been identified by the European Commission Radio Spectrum Policy Group as the "primary band suitable for the introduction of 5G-based services in Europe even before 2020"[4], 3.4 GHz is likely to attract a good deal of interest, from disruptive new entrants as well as from existing MNOs. Unlike 3.6–3.8 GHz, which has not yet been harmonized for mobile use in Europe, there are no coexistence issues to deal with in 3.4-3.6 GHz.

There are significant 3.5 GHz LTE networks being deployed in Japan and well as networks in the UK, Bahrain and some other countries. This has driven the chip-set manufacturers to commit to having chip-sets available for all handsets by 2018. Industry forecasts already predict significant 4G use of the 3.5 GHz band before the advent of 5G. The 3.4-3.6 GHz spectrum will thus be useful from as early as 2018 onwards for deployment in 4G LTE networks to provide additional network capacity in areas of high customer demand for data services. Given the time it takes to acquire sites and deploy equipment, in all likelihood devices will be available by the time any successful bidder is ready to use it in its network.

Aside from consumer handsets, the range of user equipment and Customer Premise Equipment available already in the band means that this spectrum is useable today in LTE networks for broadband data services, as demonstrated by UK Broadband in London and by UKB Networks Ltd in Swindon.

So its significance in competitive terms simply cannot be brushed aside due to the lack of devices at the time Ofcom is consulting. Indeed, the timing of the auction itself is by no means clear or certain at this stage.

The 1.4GHz spectrum will, according to Ofcom's assessment become "useable" from 2017 onwards. It is therefore more likely than not to begin to appear in handsets very soon after the auction takes place.

We also note that Ofcom considered this spectrum to be of sufficient strategic importance that it brought it within the mobile trading regulations immediately following Qualcomm's request to vary its L Band licence to permit use of the spectrum for supplemental downlink in mobile networks. Ofcom has also included 1.4 GHz spectrum in previous competition assessment, when availability of devices in the band was a more distant prospect than it is now[5].

---

[4] RSPG Opinion on related aspects for next generation wireless systems (5G), 9th November, 2016

[5] Ofcom consultation on the Award of the 2.3 GHz and 3.4 GHz bands, November 2014, paragraphs 7.61 – 7.63

2) ***Ofcom should not rely on future auctions (whether confirmed or unconfirmed) to remedy competitive problems which result from the outcome of this auction.***

Ofcom considers it "unlikely that any of the four MNOs would cease to be credible in the next few years even if they did not obtain any spectrum in this award, and that in the longer term there will be other opportunities for them to obtain spectrum to remain credible. We therefore consider the risk of there ceasing to be four credible MNOs as a result of this award is not high."[6]

We disagree. We believe that there is unlikely to be another release of spectrum capable of addressing fast growing consumer demands for mobile data for at least two years, for the reasons set out below.

Future release of 3.6 – 3.8 GHz spectrum

In figure 4.3 Ofcom shows what the spectrum shares would be in the event that one of the four MNOs obtained all the spectrum in this auction, with the 700 MHz and 3.6 – 3.8GHz spectrum included in the assessment.

In UKB's view, including 700 MHz and 3.6-3.8 GHz spectrum in a competition assessment of potential outcomes of this auction is entirely without justification.

Ofcom states:

> "4.45 If we award the remaining spectrum at 3.6-3.8 GHz with few restrictions on it, then even in the extreme outcome of BT/EE obtaining all the spectrum in this award, it would only have obtained around 40% of mobile spectrum available in the longer term.
>
> … 4.51 … We believe this band could be available within a similar timeframe as 3.4 GHz."

We do not share this view. There is significant uncertainty around the timing, nature and structure of any future auction in 3.6 – 3.8 GHz. It could be some years before this spectrum can be released for mobile use by way of an award. Even when it is released, its ability to affect competition in the mobile market will depend on the extent to which existing satellite earth station users have been or will be cleared out of the band. Existing users are almost certain not to have been cleared from the band by the time Band 42 and Band 43 spectrum appears in consumer handsets (2018 onwards). Its availability may be limited in geographic terms on a permanent basis. It may therefore never be fully "equivalent" to other mobile spectrum.

The degree of regulatory uncertainty surrounding the potential future availability of 3.6 – 3.8 GHz spectrum for mobile use means that Ofcom cannot reasonably conclude that it is

---

[6] Paragraph 4.13

relevant to an assessment of the potential competitive outcomes of this auction.

Future release of 700 MHz spectrum

Ofcom also states:

> "4.46 Moreover, it will be Ofcom that will design the confirmed 700 MHz auction and proposed 3.6-3.8 GHz auctions. We would have the ability to impose competition measures in future auctions that are appropriate and proportionate to address any competition concerns that we might have at that point.
>
> …
>
> 4.49 In particular, the release of the 700 MHz band is now clearer. We have decided to make the 2x30 MHz and the 20 MHz centre gap of the 700 MHz band available and to bring forward its release, so as to complete clearance in Q2 2020. If there is a period when the 3.4 GHz spectrum is useable and the 700 MHz band is not, we expect it to be very short. Also, the availability of user devices for bands other than 700 MHz, particularly in the 3.4–3.8 GHz band, is now more certain than it was in 2012.

In UKB's view, there is no justification for including the 700 MHz spectrum in this competition assessment.

Firstly, the 700 MHz spectrum will not become available for mobile services until Q2 2020 at the earliest. Even if Ofcom were able to hold an auction in time for Q2 2020, it is unlikely that it could be widely used in practice until at least 2021. This is too far in the future to be relevant for the purposes of this assessment. Ofcom suggests that 700 MHz spectrum will be available in a "similar timeframe to 3.4 GHz. There appears to be no evidence for this and no basis for this assertion in fact.

3.4 GHz networks can start to be built in 2017 if the auction takes place this year, ready for when handsets become available in 2018. UKB also has an extensive built 3.4 GHz network in London, which could be made available to supplement MNO network capacity as soon as handsets are in the hands of consumers.

Secondly, 700 MHz is not a substitute for, or equivalent to, 2.3 and 3.4 GHz spectrum. 700 MHz spectrum will be necessary to provide additional *coverage*. Ofcom admits that the 2.3 and 3.4 GHz spectrum being released now is suitable for providing additional *capacity* are "not an effective means of extending existing levels of mobile coverage."[7] In contrast, sub-1GHz spectrum such as 700 MHz provides good *coverage* due to its propagation characteristics. Ofcom acknowledges that 700 MHz spectrum is "likely to be high value spectrum (because it provides good coverage) and may not be as suitable for adding capacity as cost effectively as higher frequency spectrum"[8]. An operator which is

[7] Paragraphs 1.6 and 2.17
[8] Paragraph 4.156

struggling to provide adequate data capacity to its customers in densely populated areas is unlikely to be able to address this problem through the use of 700 MHz spectrum. Its potential future availability is therefore not relevant to this competition assessment.

Thirdly, only a relatively small amount of useful 700 MHz spectrum is being made available – 2 x 30 MHz of paired spectrum. (The 20 MHz "Centre Gap" is not guaranteed to have a device ecosystem at the time of release.)

Competition Concern 2 (the risk of there ceasing to be four credible MNOs)

Ofcom's assessment is that, whilst BT/EE and Vodafone have stronger spectrum portfolios, O2 and H3G would be able to remain credible in the period immediately following the auction until 3.4 GHz spectrum is supported by mobile handsets (2018), if they failed to obtain any additional spectrum[9]. In the longer term they may need more spectrum to compete, but more spectrum will be available in the longer term – 700 MHz, 3.6-3.8 GHz and potentially UK Broadband's 3.4 GHz spectrum. Ofcom's conclusion is that there are therefore likely to remain four credible MNOs without any competition measures being imposed. We don't share Ofcom's confidence.

The ability to impose measures in auctions that may or may not take place *after* the time when 3.4 GHz spectrum will be useable (which we believe will be in 2018) cannot be taken into consideration in this assessment.

Ofcom's view is that there is a material risk of an MNO not having sufficient spectrum to be credible if it holds less than 10-15% of spectrum[10]. Ofcom acknowledges that such an outcome would be a risk to the credibility of these operators[11].

Ofcom goes on to assess the likelihood of competition concerns arising in the absence of competition measures. We think this is less relevant than the *possibility* of competition concerns arising. Ofcom is required under EU law[12] to *ensure* that competition is not distorted by any transfer *or accumulation* of rights of use of radio frequencies. Therefore if it is possible that the auction could result in an MNO having insufficient spectrum to be credible, Ofcom should take steps to prevent this happening.

Question 3: Do you agree we have identified the right options to address our competition concerns?

Ofcom proposes five options:

• Option A - a cap of 255 MHz (about 42%) applied only to immediately useable spectrum, which would have the effect of excluding BT/EE from acquiring 2.3 GHz spectrum (but would permit it to acquire 3.4 GHz spectrum);

---

[9] Paragraph 4.150
[10] Paragraph 4.136
[11] Paragraph 4.155
[12] Article 5(6) of the Authorisation Directive (Directive 2002/20/EC)

• Option B - a cap of 150 MHz (about 25%) of immediately useable spectrum, which would have the effect of excluding both BT/EE and Vodafone from acquiring 2.3 GHz spectrum (but would allow both to acquire 3.4 GHz spectrum);

• Option C – a cap of 255 MHz applied only to immediately useable spectrum (as in option A) combined with an overall spectrum cap set at 340 MHz (around 37% of the sum of currently held spectrum, the spectrum in this award and 700 MHz spectrum), which would have the effect of excluding BT/EE from acquiring 2.3 GHz spectrum and limiting it to 85 MHz of 3.4 GHz spectrum. This option would also place a small constraint on Vodafone's total spectrum acquisitions;

• Option D - reserving two lots, each of 20 MHz of 2.3 GHz spectrum, for operators with smaller spectrum holdings (e.g. less than 90 MHz) or new entrants, which would exclude BT/EE and Vodafone (the two MNOs with the largest current spectrum holdings) from acquiring 2.3 GHz spectrum; and

• Option E – a tight overall spectrum cap of 255 MHz, about 30% of mobile spectrum, which would have the effect of excluding BT/EE from acquiring any spectrum in this award.

As set out above, we do not agree with Ofcom's premise that 3.4 GHz spectrum is not relevant to competition in the market in the short-medium term, and that in the longer term competition concerns can be addressed by the fact that other equivalent spectrum will be released. We think that an extreme asymmetry in overall shares of spectrum (excluding 700 MHz and 3.6-3.8 GHz spectrum) following the auction could have an adverse impact on competition.

We therefore do not agree that caps applied only to spectrum that Ofcom classes as "immediately useable" should be considered. This would rule out Options A and B.

Whilst the broad concept of Option C (a cap on "useable" spectrum plus an overall cap) might have some merit, we strongly disagree with Ofcom's proposal to include 700 MHz spectrum in the overall total. This spectrum is simply not relevant to the three year period following the auction, which is the period Ofcom should be considering. Moreover, there is no logic to including 700 MHz in Option C but excluding it from Option E. We would therefore rule out Option C as is. If Ofcom wished to consider Option C, it should remove 700 MHz from the assessment so that a total of 310 MHz (rather than 340 MHz) would represent 37% of the total.

Question 4: Do you agree with our assessment of the options we have identified for promoting competition in the auction? If not, please describe what measures you consider would be appropriate, providing as much evidence as possible to support your preferred approach.

We would not support any competition measure which did not place a cap on the amount of overall mobile spectrum which could be held (immediately following the auction). Even if measures were attached to the acquisition of 2.3 GHz spectrum, the absence of restrictions on acquiring 3.4 GHz spectrum could limit competition and innovation in the market if not from MNOs then by crowding out new entrants.

Assessment of Option C

Ofcom notes that if a cap were placed on BT/EE at the level of 37%, as proposed in the November 2014 consultation, then this would limit it to the acquisition of 55 MHz of 3.4 GHz spectrum, arguably too small a block for the provision of 5G services. However, if the 700 MHz spectrum is included in the total, then BT would be permitted to acquire up to 80 MHz of 3.4 GHz spectrum – enough to launch 5G services. Hence Ofcom proposes to include the 700 MHz spectrum on the ground that it will be available by the time 3.4 GHz spectrum is useable. As stated above, there is no evidence or likelihood that this will be the case. We therefore cannot support any measure which includes 700 MHz spectrum in the overall assessment.

Assessment of Option D

We think there would be some merit in considering Option D, but only if combined with an overall spectrum cap (which excludes 700 MHz spectrum).

Assessment of Option E

In UKB's view, Option E is the only option which adequately addresses the competition concerns that would arise from very asymmetric spectrum holdings following this auction. We do not agree with Ofcom that there is a significant risk that this option would produce adverse effects.

Ofcom notes the concern that a 30% cap would prevent BT from acquiring any spectrum in this award, thus preventing it from acquiring 5G spectrum. Using Ofcom's own logic, this is not a relevant concern for the purposes of this award and the period immediately after the auction because, by the time 5G comes to the market (around 2020) it is likely that both 700 MHz and 3.6-3.8 GHz spectrum will be available, so BT will have the opportunity to purchase that.

Moreover, if BT is particularly keen to acquire 3.4 GHz spectrum for 5G services, then it would have the option to divest itself of other spectrum such as its significant holding of 2.6 GHz spectrum.

Question 5: Do you have any further comments on our proposals on competition measures?

No.

Question 6: Do you agree with our revised proposal on the withdrawal of bids in the auction?

No comment.

UK Broadband Limited
January 2017