Non-confidential

Proposed annual licence fees for 10 GHz 28 GHz and 32 GHz spectrum

BT's response to Ofcom consultation document issued on 19 July 2022

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BT Group

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Executive summary

1. BT welcomes this consultation document on proposals to set Annual Licence Fees (ALFs) on the 10 GHz, 28 GHz and 32 GHz spectrum bands from 21 February 2023.

2. We don't consider that Annual Licence Fees are necessary to secure optimal and efficient use of this tradable and leasable spectrum that was previously awarded by auction in 2008. If Ofcom does proceed to set fees for this spectrum they should be cost-based.

3. If Ofcom maintains its proposal to apply market value based fees, then the original auction prices should be taken into account as well as the very different levels of demand for fixed links seen today compared to when the bands were auctioned in 2008.

4. If Ofcom proceeds to set annual fees on 10 GHz, 28 GHz and 32 GHz spectrum based on opportunity costs derived using Administrative Incentive Pricing (AIP) fees that it applies to other bands, it must take into account actual demand seen in other bands and the average rather than peak spectrum re-use factors observed in those other bands. Only this would properly reflect opportunity costs or market value. We estimate that on this basis a fee of £666 per 2 x 1 MHz national channel could be justified for the 28 GHz and 32 GHz bands.

5. The 10 GHz band spectrum has particular interference constraints that need to be taken into account when setting the appropriate level of annual fees, in addition to the consideration of demand levels in substitute bands.

6. Finally, we note that Ofcom is yet to decide on the way forward on the 40 GHz band and the level of annual fees that would be applied if that spectrum is not re-auctioned and brought into its spectrum sharing framework. It might be appropriate to wait until the decision is taken on 40GHz and, if fees need to be set for 40 GHz, to make revised proposals for 10 GHz, 28 GHz, 32 GHz at the same time as proposals for any 40 GHz band fees.

1 Introduction

BT[1] welcomes this opportunity to provide its views on Ofcom's proposals[2] for annual licence fees that would be applied to the 10 GHz, 28 GHz and 32 GHz spectrum bands from 21 February 2023.

In **section 2** we comment on the trends we have seen in demand for fixed links spectrum. In **section 3** we discuss the appropriate methods to determine licence fees and provide our comments on Ofcom's proposals and possible alternative approaches that we consider to be more appropriate. In **section** 4 we have provided our views on whether Ofcom proposals fulfil their statutory duties and in **Section 5** we discuss next steps.

Finally, in Annex A we address the consultation questions.

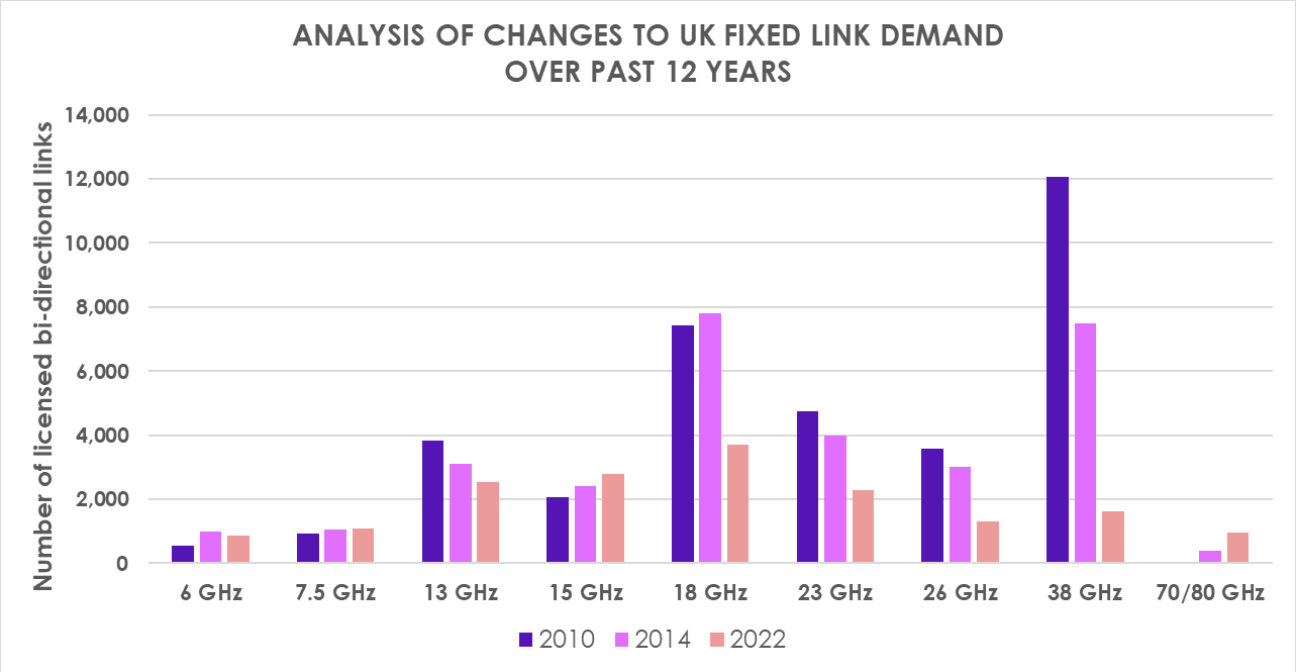
[1] BT, including our mobile subsidiary EE Ltd.

[2] https://www.ofcom.org.uk/__data/assets/pdf_file/0021/241752/alf-10-28-32-ghz-condoc.pdf

2 Changing demand for fixed links

Before addressing the substance of Ofcom's proposals and the consultation questions, it is relevant to reflect on the past trends of how fixed links spectrum demand has evolved and how it might be expected to change in future.

In Figure 1 we illustrate how the volume of fixed link licences has changed over the past 12 years. This information has been drawn from a number of sources[3].



Source: BT

Figure 1: Evolution in demand for fixed link licences in Ofcom managed bands

This analysis shows a dramatic drop in the volumes of fixed links in bands between 18GHz and 38 GHz over the past decade. There is no evidence to suggest this trend will reverse and given the ever improving availability of fibre at reducing costs it seems unlikely it will do so in the foreseeable future.

This evidence is important in the context of discussing opportunity costs for the 32GHz (and 28GHz) spectrum bands.

We are familiar in particular with the 32 GHz band where we preferably accommodate our own fixed link requirements where this is technically possible as this spectrum was acquired by BT/EE at auction and is not presently subject to annual fees.

[✂ Redacted]

[3] 2022 numbers are taken form Ofcom's Wireless Telegraphy Register (WTR); 2014 numbers taken form Figure 3-3 of a report by Plum available at https://www.ofcom.org.uk/__data/assets/pdf_file/0030/79464/plum_report.pdf ; and 2010 numbers from an Ofcom response to an ECC Questionnaire http://static.ofcom.org.uk/static/info-for-industry-j7shd6shdnfjdh/radiocomms/ifi/licensing/classes/fixed/links/members_area/fwilf/documents/2010/FWILF16a.pdf (consistent also with similar numbers in the Plum report for around the same date).

[✂ Redacted]

3 Approach to determine annual licence fees

3.1 Basis for determining appropriate fees

Cost based fees would be suitable for these bands

The 10 GHz, 28 GHz and 32 GHz bands were assigned by the market mechanism of an auction. These spectrum access licences are tradable in a variety of ways and leasing of the spectrum is permitted. If another party had higher value use for the spectrum then these mechanisms would allow a more optimal and efficient use of the spectrum to be achieved. To date we are not aware of any demand to do this and we consider the spectrum to be optimally assigned.

Ofcom's argument that cost based fees would see an excess of demand for these bands is flawed

We don't see any reason why any annual fees are required to secure optimal and efficient use of the spectrum.

Ofcom first argues that there is potentially demand that cannot be accommodated in the 10, 28 and 32 GHz bands because the licensees hold individual fixed link licences from Ofcom in other functionally substitutable bands. We would argue that those are mainly historical licences that have not been switched over the self-managed bands because of the need to avoid disruption to existing customer services and the desire not to prematurely write-off existing equipment, or because of technical reasons (i.e. the Ofcom band is a lower frequency that supports longer path lengths than can be accommodated at the required availability in the self-managed bands).

Ofcom next suggests that cost based fees for self-managed bands would create excess demand as acquiring more self-managed spectrum would be more attractive than continuing with Ofcom managed bands, especially given the lower transaction costs and flexibility of self-management. Firstly, market mechanisms would regulate this excess demand amongst tradable self-managed spectrum. Secondly, if the fees for Ofcom managed spectrum are too high (which is likely given they were set decades ago based on the opportunity cost of the spectrum in question several decades ago when more efficient wireless technology and use of alternatives to wireless had higher differential costs than today[4,5]) one would expect this to create artificial demand for the block assigned bands (which is what Ofcom may be contemplating). In any case, as illustrated in the previous section, overall demand for fixed links is falling, particularly in the higher frequency bands near 28 GHz and 32 GHz.

Ofcom then argues that clearing 26 GHz and 40 GHz bands for mobile could lead to additional demand for 10, 28 and 32 GHz bands. This may be true to a certain extent, but given the number of links involved and the amount of spectrum and range of bands available it seems unlikely that any additional demand could be categorised as "excess demand".

Ofcom notes that the 2018 fixed links review identified some key demand drivers for fixed links including the increasing demand for mobile services. Ofcom suggests this could lead to demand for wider bandwidths and additional block assigned spectrum if Ofcom managed spectrum can't support the demand. Our view on this is that when looking at the much higher number of fixed links (i.e. demand) that was supported by Ofcom bands in the past compared to today, it seems unlikely that the additional demand would be "excess demand". And once again, the secondary market mechanisms of trading and leasing would secure optimal use of the self-managed 10, 28 and 32 GHz bands. ALFs that are too high are likely to reduce demand below efficient levels, so are contrary to

[4] "The reference fee is based on an average incremental cost to an operator of reducing its need for spectrum by adopting more spectrally-efficient technology, and was set in 2004" (Ofcom Consultation, paragraph 3.24)

[5] The 2015 Plum report on fixed links fees (https://www.ofcom.org.uk/__data/assets/pdf_file/0030/79464/plum_report.pdf) at Page 60 concluded that opportunity costs are much less than AIP fees for bands above 20GHz.

Ofcom's duty to secure optimal and efficient use of the spectrum. It is unclear why ALFs are needed to secure optimal and efficient use of the 10 GHz, 28 GHz and 32 GHz tradable and leasable bands.

Finally Ofcom argues that the 28 GHz and 32 GHz bands may be of interest for FWA and that if the spectrum were priced at cost it would make those bands more attractive than other shared bands from Ofcom because those other Ofcom bands don't have the same guaranteed quality of service. We note that the guaranteed quality point is not dependent on the relative spectrum cost and if the point is that the cost based fees result in too much demand we again don't see why that is something to be discouraged and would be managed according to market mechanisms. We would encourage Ofcom to provide evidence of pent-up demand including any stakeholder concerns raised regarding the lack of ability of the block bands subject to this consultation for trading or the unwillingness of existing licensees to trade them.

In summary, any fears of "excess demand" for the 10, 28 and 32GHz bands if they are priced at cost (presumably Ofcom's cost, which is essentially zero) seem misplaced and Ofcom has not provided any evidence why market mechanisms would not achieve optimal and efficient use of the spectrum.

If Ofcom considers that cost based fees would lead to some unhelpful distortion in the market then the better approach would be to examine whether its existing fees set on an administrative basis to incentivise efficient use in comparable bands are actually too high. The declining demand in some higher frequency bands would suggest this could be the case.

Original auction prices are a better guide to market value than AIP applied in other bands

We disagree with Ofcom's conclusion that the original auction prices should not be considered when estimating the forward looking market value of the 10 GHz, 28 GHz and 32 GHz bands. Although we accept that the auction was some 15 years ago, and note Ofcom's point that mobile data traffic has increased dramatically, we also note that the spectral efficiency of fixed links has also improved substantially over the period, with higher order modulation schemes and cross-polar working widely used. Availability of fibre, which is a substitutable alternative to wireless, has also significantly improved.

The market value of the spectrum indicated by the original auction of national licences in the 10 GHz, 28 GHz and 32 GHz bands is as shown in Table 1 below. As this was a combinatorial auction, in which prices paid by some winners corresponded to a combination of lots spread across more than one band, some interpretation of the auction result is needed to estimate prices for individual bands. For simplicity and to get a rough approximation, we have considered amounts paid by winners with assignments uniquely in only one band.

Table 1: Value of 10 GHz, 28 GHz and 32 GHz spectrum estimated from the 2008 auction

	10 GHz[6]	28 GHz[7]	32 GHz[8]
Bandwidth	2 x 20 MHz	2 x 224 MHz	2 x 378 MHz
Auction revenue	£39,000	£260,500	£455,130
Lump sum value (per 2 x 1MHz)	£1.950	£1,163	£1,204
Lump sum value (per 2 x 1 MHz) (if inflated with CPI for 2022 prices)	£2,799	£1,669	£1,728
Equivalent ALF[9] (per 2 x 1 MHz)	**£151**	**£90**	**£93**

We note that Ofcom proposes to use AIP applied in other bands to set "market value" of the 10 GHz, 28 GHz and 32 GHz bands. On this point we would argue that it is not really the market value that is indicated by AIP, but an administrative value set by Ofcom based on its view of average incremental cost savings resulting from using more efficient fixed link equipment set decades ago.

Ofcom makes the point that it used AIP in functionally substitutable bands when it set annual fees for 28 GHz spectrum licences in 2015. We would however note that in 2015 Ofcom did not have the evidence of dramatically reducing demand for fixed link licences then that it has available today. We don't think that because Ofcom took the approach it did in 2015 it is a compelling reason to again do so today.

3.2 Concerns with Ofcom's calculation methodology

Although we argue that Ofcom should set fees for 10, 28 and 32 GHz based on its costs or taking into account the original auction prices, if Ofcom were to press ahead with its proposed methodology we would have concerns on both the calculation method and the interpretation (and accuracy) of the data used.

Ofcom proposes to use the AIP in what it considers functionally substitutable Ofcom-assigned fixed links spectrum bands to estimate the market value in the block-assigned bands. Specifically, Ofcom proposes to use AIP estimated for 13 GHz as the reference band for 10 GHz, and to use AIP for 26 GHz as the reference band for both 28 GHz and 32 GHz to identify the fee per link using the current fixed link algorithm:

Fee per link = Reference fee x Bandwidth factor x Frequency band factor x Path length factor x Availability factor

Ofcom then multiplies this fee per link estimate by a national peak channel re-use rate as well as the number of channels that can fit within the block assigned spectrum.

[6] Digiweb paid £39,000 for 2 x 20 MHz of 10 GHz band spectrum

[7] Arqiva paid £260,500 for 2 x 224 MHz of 28 GHz band national spectrum

[8] BT paid £183,000 for 2 x 126 MHz and Orange paid £272,130 for 2 x 252 MHz of 32 GHz band spectrum

[9] Derived from the lump sum value using an annualisation rate of 5.4% (consistent with that recently used by Ofcom when setting 2100 MHz band ALFs, see https://www.ofcom.org.uk/__data/assets/pdf_file/0032/221999/1900_2100-mhz-condoc.pdf)

Ofcom should not use peak channel re-use and a multiplier for the per link fee

We don't think it is reasonable or logical to look at the maximum number of times that any channel is re-used in a substitutable band to set a multiplier that is applied to every MHz of the 10, 28 and 32 GHz bands. This approach does not correctly reflect the "opportunity cost" of the use of the spectrum by the 10, 28 and 32 GHz licensees as it has no regard whatsoever to the level of demand for those spectrum bands.

Under the Wireless Telegraphy Act, consideration of the "demand for use of the spectrum for wireless telegraphy" and "the demand that is likely to arise in future for the use of the spectrum for wireless telegraphy" are explicit requirements on Ofcom when carrying out its spectrum functions.

Ofcom should instead consider – as a ceiling - the level of demand and the aggregate of the AIP that is charged in a similar band which is a substitute. For example, in the case of 32GHz the opportunity cost is better represented by the value of the observed demand for 38GHz links as they could technically (taking into account in particular link length) equally be accommodated in 32 GHz. So in this case that aggregate of the actual 38 GHz licence fees should be used to determine the "market value" per MHz, at a maximum. This can be estimated by applying the fees algorithm to the database of links. We illustrate the result of this approach in section 3.3 below.

Ofcom's analysis of maximum frequency re-use appears to contain significant errors

We have examined the spreadsheet[10] that Ofcom has published alongside the consultation document in which it has analysed the Wireless Telegraphy register (WTR) data to look at the number of times channel frequencies are reused in substitute bands to the 10, 28 and 32 GHz bands.

On careful analysis of the data it appears to us that there are instances where licence data is duplicated multiple times in the spreadsheet and this has flowed through to Ofcom's estimates of how many times channel frequencies are re-used, leading to errors that may be significant in terms of conclusions that Ofcom has drawn. As an example, licence 0950141/1 Tx frequency is duplicated 152 times in the database, resulting in an over-estimate of 75 for of the number of times that a 28 MHz channel in the 23 GHz band is used. There are several other instances of duplicate licence information in the spreadsheet, most significantly the 28GHz channel re-use estimate of 296 at 13 GHz appears to be over-estimated by 151 as a result of duplicate entries for licence 0560841/1.

3.3 Determining market value using existing AIP rates

Estimated market value based on AIP and demand in Ofcom managed bands

After removing apparent duplicate entries in the spreadsheet of links, we have estimated what the total AIP receipts may be for each of the bands that Ofcom manages. We have taken into account actual link lengths in bands where this is relevant (assuming the minimum path length applicable where bit rate is below the specific threshold), but have made the assumption that all links are planned to 99.99% availability as we don't have link by link information. This calculation exercise resulted in the following estimates of the market value for the bands based on the current AIP rates and the level of demand in the bands, as shown in Table 2.

[10] https://www.ofcom.org.uk/__data/assets/excel_doc/0023/241754/10-28-32-GHz-ALF.xlsx

Table 2: Approximate calculation of fees charged per 2x1 MHz for Ofcom managed bands

Band	13 GHz	15 GHz	23 GHz	26 GHz	38 GHz
Bandwidth (MHz)	500	850	1,600	2,000	2,500
Number of links	2,481	2,672	2,152	1,301	1,694
Total AIP fees	£2,133,022	£1,624,177	£1,855,814	£479,919	£1,066,025
Fees per 2x1MHz	£8,532	£3,822	£2,320	£480	£853

For the 28 GHz and 32 GHz band we would argue that a value of around **£666 per 2 x 1 MHz** could be a suitable level of ALFs if Ofcom does not use auction prices or cost based fees. This is the average of the 26 GHz and 38 GHz spectrum value implied by the existing AIP and demand in those bands. This compares to the £4,576 value per 2 x 1 MHz that Ofcom has proposed.

For the 10 GHz band, the 13 GHz and 15 GHz band values could be relevant benchmarks. However, as explained in the following section, there is an important factor which means that the 10 GHz band cannot be directly compared with adjacent bands.

We further note that even using existing AIP for the nearby bands as a benchmark for fees to be charged for national licences significantly over-estimates the opportunity costs. This is because in many areas of the country there are very few links and there is no congestion or likely future congestion. Therefore, there is no justification for charging anything other than cost recovery based fees for those links, whereas Ofcom actually charges an incentive based fee that exceeds opportunity costs. This is a point identified by Plum in their 2015 fixed link review[11].

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[11] Plum Consulting, https://www.ofcom.org.uk/__data/assets/pdf_file/0030/79464/plum_report.pdf A final report for Ofcom, Page 6, 16 April 2015.

Assessment of the proposals against Ofcom's statutory duties

Ofcom has provided limited, if any, evidence of excess demand to support its claim that ALFs in 10, 28 and 32 GHz bands promote efficiency, investment, competition, or consumer benefits. Much of Ofcom's putative evidence for excess demand is simply based on the difference between a comparator AIP set in an administrative process several decades ago and used as a proxy for opportunity cost today, and interpreted as evidence for likely excess demand in the block assigned comparator band. This is insufficient.

Ofcom argues that ALFs are required to promote the optimal use of spectrum in these bands. However, even if there was excess demand, despite fixed links spectrum licences being tradeable and with leasing permitted, licence fees set at full market value are unlikely to promote any of these objectives. Instead, they are likely to go against Ofcom's statutory duties including investment and consumers benefits. We set out our reasoning and evidence below.

Securing optimal use of spectrum

We disagree with Ofcom's assessment that spectrum trading alone cannot be relied upon to move spectrum into the hands of the most efficient user.

Ofcom's primary reasoning is speculative: the suggestion that firms may put greater weight on avoiding costs rather than securing revenue associated with spectrum holdings is not demonstrated or evidenced.

The further reasoning of high transaction costs or lack of price information preventing trading to more efficient users is again speculative and appears that Ofcom has not recognised in its assessment that leasing of the 10 GHz, 28 GHz and 32 GHz spectrum is permitted, in addition to trading. Leasing provides a much simpler and light weight means to give other parties access to spectrum where they can use it more efficiently than the primary licence holder.

Ofcom finally cites the limited trading of the licences to date as a reason to require AIP being applied to the bands. We would argue that the limited trading is a result of lack of demand for the spectrum given there is plenty of fixed links spectrum available from Ofcom in many similar bands.

We don't see why applying ALFs will improve ability to trade the spectrum. At the levels Ofcom is proposing it would make it far more unlikely, because the fees charged assume a level of re-use that is not seen across the entirety of each of Ofcom's managed bands. Even if such channel frequency re-use were achievable, it would take years for an acquirer of traded spectrum to re-use channels to the level Ofcom assumes possible, yet the acquirer would still be paying the annual fee based on maximum possible re-use even in the early years of deployment.

At the fee levels Ofcom proposes to apply, it is more likely that licensees may hand the spectrum back to Ofcom than be incentivised and able to trade it to other parties. This would not support investment or efficient use of spectrum given the low demand seen by Ofcom for equivalent fixed links spectrum.

Impact on citizens and consumers

A set out above, we consider that ALFs are unnecessary to secure optimal and efficient use of spectrum. Therefore we disagree that by not applying ALFs there is any negative impact on citizens and consumers.

As we have set out, we consider the proposed ALFs to be much higher than the opportunity cost of the spectrum given the relatively low demand for the spectrum and the availability of substitute spectrum in Ofcom managed bands. We therefore consider that even if Ofcom were right that ALFs are necessary, the proposed level of ALFs will not benefit citizens and consumers as they are too high and could lead to unused spectrum and reduced investment.

Impact on competition

We don't believe that foregoing ALFs for the 10 GHz, 28 GHz and 32 GHz bands will distort downstream competition. If there are any concerns in this area Ofcom could consider lowering the AIP rates that it charges in other substitute bands if there is low demand and plenty of available capacity.

At the ALF rates proposed, which we think likely to exceed the opportunity costs, competition could be distorted as owners of the bands in question would face much higher average spectrum costs per link than the costs of individual equivalent link licences from Ofcom.

Impact on investment

We think that the levels of ALFs proposed, which exceed our estimate of opportunity costs, could deter investment in these bands in favour of other Ofcom bands or fibre solutions. The proposed fees could also have a negative impact on some licensees' ability to fund development and innovation.

4 Next steps

Although fees may be applied to the 10GHz, 28 GHz and 32 GHz and 40GHz spectrum access licences from 21 February 2023, we do not believe it is urgent, or even necessary, to do so to secure optimal and efficient use of this fully tradable and leasable spectrum. We note that Ofcom is yet to decide on the way forward on the 40 GHz band and the level of annual fees that would be applied if that spectrum is not re-auctioned and brought into its spectrum sharing framework. It might be appropriate to wait until the decision is taken on 40GHz, and if fees need to be set for 40 GHz, to make revised proposals for 10 GHz, 28 GHz, 32 GHz at the same time as proposals for any 40 GHz band fees.

Appendix A Answers to consultation questions

Question 1: Do you agree with our initial conclusion that fixed wireless services are the highest value alternative use for each of the 10, 28 and 32 MHz (sic) bands? If not, please provide evidence to support your answer.

Yes, BT agrees that fixed wireless services are the highest value alternative use for the 10 GHz, 28 GHz and 32 GHz bands.

***Question 2: Do you agree with our initial conclusion that there is likely to be excess demand for each of the 10, 28 and 32 GHz bands in future, if cost-based fees were applied and that therefore an AIP fee is appropriate? If not, please* provide evidence to support your answer.**

No, BT does not agree, for the reasons set out in section 3.1.

Question 3: Do you agree with our proposed market value for the national 10, 28 and 32 GHz spectrum? If not, please provide evidence to support your view.

No, we do not agree, for the reasons set out in section 3.2.

Question 4: Do you agree with our proposed calculation of the regional 28 GHz ALFs set out in detail in Annex A6, including our proposed calculation of fees for specific locations in part of a region? If not, please provide evidence to support your view.

No, we have similar concerns over the 28GHz fees calculation to those for the 32 GHz.

Question 5: Do you agree with our initial conclusion that fees set based on our estimate of market value will best meet our statutory duties?

No, we don't agree that fees based on market value are necessary in the case of tradable spectrum. We provide views on Ofcom's assessment of its proposals against its statutory duties in section 4.

Question 6: Are there any other comments that you wish to make in respect of the proposals that we make in this consultation?

In the proposed regulations in Annex 9 of the consultation document, the regulation 2(e) refers to the 10MHz Band and the 32 MHz Band. This should instead refer to the 10 GHz band and 32 GHz band.

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