

techUK response to Ofcom consultation: Review of spectrum fees For fixed links and satellite services 30th July 2015

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techUK | Representing the future



Introduction

About techUK

techUK represents the companies and technologies that are defining today the world that we will live in tomorrow. In a very real sense techUK represents the future.

At the heart of tech in the UK is an ecosystem of 270,000 companies producing digital technologies, products and services. From east to west, north and south, from enterprise class organisations to established medium-sized businesses, growing small businesses and an exciting generation of tech start-ups: the UK is a hotbed of tech talent and techUK exists to represent the sector in its entirety.

Our role as techUK is to ensure that we seize the potential for good and address the disruptive new challenges that change and innovation always present. We work to understand the opportunities that technology provides; to support the companies and innovators that can realise those opportunities.

This underpins our simple vision to ensure that tech is good for the UK, the UK is good for tech and that tech is good for people.

Summary of techUK position

techUK welcomes Ofcom's review of fixed link and satellite spectrum fees and is pleased to contribute its views on the subject. Indeed, we have encouraged Ofcom to undertake such a review in light of the 10-40GHz fixed links spectrum auction results which suggested that the present fees were out of step with the much lower spectrum values revealed in that spectrum award.

Some aspects of the consultation proposals are welcome, for example the recognition that fees could be reduced in some remote areas with little prospect of congestion. techUK in principle also supports the suggestions to simplify the fees algorithm and the suggestion that further discounts for using improved antenna performance could be introduced. However, other aspects of the proposals may benefit from further analysis and consideration.

In this regard, techUK would like to emphasize the need to be clear on the precise objectives of the fees review and the problem to be solved by it, especially in the case of introducing increases in fees. Fees should be increased only when there is clear demonstrable evidence that there is congestion in the given band and a fee increase would reduce it.

Our arguments can be summarised as follows:

- Insufficient evidence for increased congestion: techUK questions whether the evidence that has been made available supports the claim that demand for fixed links is increasing, and in particular the conclusion that there is sufficient concerns about congestion to warrant fee increases in bands below 20GHz. The number of fixed links licences on issue by Ofcom appears to have reduced significantly in recent years and it has not been demonstrated that the trend of increased bandwidths outweighs this. techUK considers that on balance for bands above around 10GHz an increase in fees is not necessary and could potentially lead to less efficient use of spectrum if introduced as currently proposed.
- The right incentives for the right outcomes: The overwhelming demand on operators to service an escalating demand for data volumes creates a clear



momentum towards the introduction of fibre wherever this is feasible. Use of fixed links radio is only adopted or retained where fibre is infeasible or particularly high. As such increasing licence fees for links, particularly between 10 GHz and 20 GHz is unlikely to have a useful effect and indeed create an unwanted barrier in solving coverage challenges where fibre proves excessively expensive or impractical. Reducing fees for bands above 20GHz on the other hand will have a beneficial effect in encouraging the use of higher frequencies in preference to lower frequencies and thus will be more effective in relieving any pressures on these bands. We also believe from looking at the assessment data that the demand from satellite FSS services in the 10-20 GHz frequency range is unlikely to decline, meaning these bands will continue to be used by satellite services.

• Unsuitability of full opportunity costs and alternative evaluations: techUK believes that the move to full opportunity cost is not justified in order to promote efficient use. In addition to the approach of analysing the opportunity cost of fixed links spectrum, based on the alternatives of (i) wired connections or (ii) two links in higher frequency bands, Ofcom should consider others that could be relevant. Eg. the alternative of moving to co-frequency cross-polar working in a narrower channel.

Furthermore we do not agree with the assessment by Plum that the spectrum used by satellite earth stations has not grown appreciably in the last 3 years. This statement is not a true reflection of the fact that such earth stations act as an anchor for multiple spot beam coverage which continues to be used by a growing number of customers not just in remote areas but also in suburban regions. The future outlook is for continued demand growth, at Ka band where demand for spectrum for consumer broadband services will grow substantially, especially in the exclusive satellite bands were satellite use does not impact fixed links. However, demand at Ka band is uncertain as it depends in part on government policies in respect, notably, of rural broadband.

techUK agrees that alignment of satellite and fixed links fees continues to be a sensible approach. However, the supporting technical justification for the proposed increases, taken from the Plum report would benefit from further refinement, to more accurately model the potential interference distances between satellite earth stations and fixed links. This is likely to suggest, that the appropriate fees should be close to the present levels. One can also put the argument that satellite fees in Ka-band spectrum should be reduced in order to encourage migration to such frequencies due to the congestion in lower satellite frequencies.

In fact it appears that while the opportunity cost analysis set boundaries of possible full opportunity costs, the proposal to increase fees in most bands is actually an arbitrary 10% increase justified on a presumption that certain bands are congested. When balanced with evidence from the past auction of low fixed link spectrum values, and the fact that those auctioned bands have large capacity that is unlikely to be exhausted in the foreseeable future, techUK sees no need to increase fees at this time and believes there is a good case to consider reducing them from present levels.

Finally techUK believes that in an era of ever increasing focus on securing world class broadband coverage across the UK, industry, Government and regulator must be aligned in their strategic actions if we are to secure this outcome for the benefit of consumers and citizens. As such, in terms of fixed links and fixed satellite systems which play an integral part of delivering the outcome, the trend should be for an overall reduction in licence fees.



techUK response to the consultation questions

Question 1: Do you agree with Plum's view of the potential higher value alternative mobile use of the 3.6-3.8 GHz bands over the next seven to ten years?

Answer 1: In principle, it is reasonable to assume that opportunity cost should reflect higher value mobile use of this band. Given how limited this mobile use has been after 7 years of availability, though (the EC decision on BWA in 3400-3800 MHz is from 2008), Ofcom should make sure to best evaluate how this opportunity becomes concrete. This may also be more relevant to areas of high mobile traffic density, reinforcing the importance of the related proposals for rural area discounts. With such large unexpected increases the question of phase in periods would also arise. We would also like to note that In the case of fixed satellite services typical economic lifetimes for equipment are still likely to be extended beyond 15 years as advances in propulsion and equipment technology continues to improve.

Question 2: Do you agree with Plum's analysis of current and future demand for spectrum for fixed links? Please give your reasoning.

Answer 2: No. techUK is unconvinced, based on the evidence that has been made available and the experience of its members that demand growth is sufficient to lead to the conclusion that a congestion problem needs to be addressed by increasing fixed links fees. According to Ofcom's annual reports, the number of fixed link licences has fallen by about 25% in the last 6 years, as illustrated below.



Source: Ofcom annual reports

techUK acknowledges that the bandwidth of fixed links is increasing and hence considering volumes in isolation does not reveal the true situation. Since fixed links fees are set in proportion to bandwidth, it would be interesting to look at how fee receipts have varied over time as that could be a proxy capacity growth as it would reflect volume*bandwidth.

Aside from whether capacity demand has grown or not, the more relevant issue is whether there is significant congestion now or in the foreseeable future, and whether increased fees are needed to limit demand growth. If it is deemed necessary to limit demand by increased fees it is important that this doesn't lead to less use of a given band as that would be reducing the efficiency of spectrum use rather than improving it.



Question 3: Do you agree with Plum's analysis of current and future demand of spectrum for PES and TES? Please give your reasoning

Answer 3:

We would like to highlight that satellite earth stations are used to transmit and receive telecommunications feeder-link traffic for many different types of services, users, and applications such as telecom operators, broadcasters and private organisations.

Much of the traffic is international in nature, but there is a substantial amount of traffic also used within the UK by telecom operators, enterprise users, and consumers, while also the Ministry of Defence in overseas. In addition VSAT services providing broadband connectivity, data services and broadcast content are provided directly to consumers and SME businesses using small dishes fixed on the ground within the UK.

What is missing from the Plum analysis for the future demand for spectrum from satellite services is the use by satellite earth stations to backhaul 3G/4G and indeed in the future anticipated 5G data backhaul connectivity. The frequency bands used by these satellite services cannot potentially be used by fixed links.

We also like to make it clear that within Figure 4-1 These numbers are based on information held by Ofcom on licences for permanent earth stations, as well as those with Recognised Spectrum Access (RSA), but they do not include licence-exempt terminals e.g. VSATs at high density fixed satellite systems which number in the thousands. Such permanent earth stations might be lower in number, however they provide connectivity to smaller terminals.

Question 4: Do you agree with the approach taken by Plum to calculate the opportunity cost of the spectrum? If not, how would you suggest the LCA is calculated? Do you also agree that this methodology is likely to provide a more conservative estimate?

Answer 4: techUK considers that the approach taken is an upper estimate of opportunity cost and we would suggest that other more practical options are also evaluated, such as the cost of dual-polar links as an alternative to costing two replacement links in a higher frequency band.

techUK notes that a 10% increase on current fees for many bands below 20GHz is proposed. Given the doubts as to whether there is sufficient concerns around congestion to warrant fee increases when considering all the bands available (both Ofcom managed and auctioned bands), together with the fact that reduced fees are proposed for bands above 20GHz which will incentivise use of those bands where technically feasible, techUK considers that the increase is not required.

Question 5: Do you agree that Plum has identified the correct options for its LCA analysis? If not, what option(s) do you suggest we consider for the Least Cost Alternative?

Answer 5: See response to Q4.



Question 6: Do you agree with the cost assumptions that Plum has used in its analysis? Please provide documentary evidence if you disagree.

Answer 6: techUK believes the costs are reasonable, but as highlighted in our preamble considers this solution for applicants denied spectrum is but one of a series of approaches, and probably a comparatively costly one at that. The leap between £100k and £200k site construction cost at a 20GHz boundary seems somewhat artificial.

Question 7: Are there any other pieces of publicly available evidence we could use to estimate the opportunity cost of the use of 3.6-3.8 GHz for mobile use now?

Answer 7: No comments.

Question 8: Do you have any comments on Plum's suggestion to remove the path length factor?

Answer 8: techUK agrees that the path length factor should be removed. As plum has pointed out, the band factor already incentivises use of higher frequencies and this seems to be a sufficient means to encourage use of higher frequencies where technically feasible.

Question 9: Do you have any comments on Plum's suggestion to add a location factor?

Answer 9: techUK agrees that a geographic factor is a sensible addition to the algorithm. This should discount the normal fees in cases where the fixed link is located in an area for which, taking account of the range of spectrum bands available and the low demand, there is little realistic prospect of congestion issues arising. This might be in remoter areas of Scotland for example where fixed links can provide vital infrastructure but due to the low population density there may be very limited demand for spectrum.

techUK would welcome more detailed proposals from Ofcom as to how this geographic discount might be implemented and would be happy to discuss the matter further if helpful.

Question 10: What are your views on the need to revise the bandwidth factor in the fixed link algorithm?

Answer 10: techUK considers that, if necessary, the band factor could itself be adjusted to take account of the different bandwidths typically used in different bands if this is required, rather than varying the bandwidth factor itself in each band.

Thanks to frequency re-use made possible by using multi-spot beams on the Ka band, this throughput can be increased 50 to 100 fold – hence these satellites are referred to as high-throughput satellites ("HTS"). The increase in throughput allows satellite operators to offer satellite capacity at more favourable prices.

So the band factor should take into account the efficiency in satellite frequency re-use multi-spot beam spectrum; but given that due to the higher power on spot beam technology more bandwidth is provided, such increase on bandwidth should not lead to higher regulatory fees.



Question 11: What are your views on the benefits of additional incentives for the use of high performance antennas? How might these best be implemented in our fees algorithm?

Answer 11: In principle techUK is open to the possibility to include a reduction in fees if an operator spends extra to use a higher performance antenna than those that are more typically used at present. However we would need to better understand the range of currently deployed antennas and understand the costs and benefits that high performance would arise. This could be an area of further analysis prior to developing consultation proposals.

Question 12: What are your views on the suggestion that we further consider ways to incentivise the use of automatic power control, a suggestion we are minded not to take up?

Answer 12: techUK agrees that given the complexity of taking account of ATPC in the pricing algorithm and the uncertainty about the benefits, it is currently better not to include this factor.

Question 13: What are your views on the proposed revisions to the PES algorithm and the TES ratio? In particular, do you agree we should use the relative denial areas to reflect the difference in opportunity cost between PES, TES and fixed links? Do you have any other suggestions for improvement?

Answer 13: techUK in principle agrees that satellite fees should be related to the constraint that the Earth stations place on the possibility to deploy fixed links. But this should not be reflected in existing earth stations where there are no fixed links services and therefore the fees for existing earth stations should remain. Concerning the analysis undertaken by Plum and the resulting substantial increases in fees, tech UK has some concerns. For example, the polarisation discrimination that may typically exist between satellite earth stations and fixed links does not appear to be accounted for. A circular to linear polarization interference scenario could reduce the interference levels by up to 3dB which would substantially affect the modelled interference zones.

Question 14: Do you agree that the benefits of implementing geographic pricing are sufficiently high to warrant us considering this further? Should we look at both where mobile is, and is not, an alternative use? Do you have ideas on how this could be implemented?

Answer 14: Yes, see response to Q9.

techUK supports the idea to discount fixed link fees in rural/remote areas for both the 3.6 - 4.2GHz band as well as other fixed links bands. This could be done by considering squares of say 100kmx100km and assessing the density of links within those squares considered in aggregate across a wide range of bands.

Question 15: Do you have any comments to make on any issues related to next steps and implementation?



Answer 15: techUK considers that some further analysis is needed before developing consultation proposals to address the areas of concern as well as those areas of the proposals that in principle techUK supports. techUK would be please to assist Ofcom in its further work in advance of its publication of consultation proposals. One method to assist Ofcom is to hold a workshop with stakeholders.