Supporting increased use of shared spectrum

BT's response to Ofcom's consultation issued on 23 November 2023

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BT Group

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Executive summary

1. BT welcomes Ofcom's consultation proposals for how its shared access framework could evolve to improve its suitability for existing and new applications and enable more efficient use of this spectrum. BT makes use of shared access spectrum and is pleased that Ofcom's proposals include some of the points we raised in response to the earlier 'Call for inputs'.
2. The take-up of shared access licences has been modest to date and the currently available spectrum, if efficiently managed, should provide the required capacity for considerable growth in deployed systems. If current trends continue, and it does not become more extensively used, Ofcom should consider instead making some of it available for licensed use by national mobile network operators given the opportunity cost of the shared access use is high relative to the benefits to date.
3. BT can support most of the various changes to the technical parameters and coordination process that Ofcom has set out in the consultation. The increased power limit for low power licences is welcomed, as is the requirement to submit more detailed antenna information and the possibility to pursue user-led coordination agreements. Co-ordination on the basis of synchronised systems should yield considerable efficiency improvements, but the detail of how that is implemented when coordinating with existing deployments will be important.
4. We don't think that incentive pricing has an appropriate role in the shared access framework in order to promote efficient use of spectrum, at least in the short term. Ofcom should review the situation in three years' time in light of how use of the 3.8-4.2 GHz band develops. The indicative proposals that Ofcom has set out would be problematic as they stand and would need some modification if they were taken forward. In particular, we believe that concessions would be justified in the case of existing deployments. Also, where there are several licensed base stations run by an operator on the same site and on the same channel frequency, we propose that fees should be discounted to reflect the fact that much of the interference generated will be self-interference and the sterilizing effect on ability to accommodate other uses would be less than if the base stations had used multiple different frequencies had all been deployed in different areas.

1 Introduction

BT[1] welcomes this opportunity to provide its views on Ofcom's proposals for the evolution of its Shared Access framework[2].

BT holds a number of 3.8 – 4.2 GHz shared access licences and has some experience of operating systems in this spectrum band. We are familiar with the licence application process and understand the limitations of the current arrangements and how these could usefully be changed. We also have historically made use of the 1800 MHz shared access spectrum for our BT Onephone product and continue to do so.

This response is structured in line with sections of the consultation document and provides our answers to the consultation questions.

2 Supporting new opportunities and improved user experience

Capturing more information in the coordination process

BT agrees that provision of more detailed information about the systems to be deployed could significantly improve the frequency coordination process and should enable much more efficient use of the shared access spectrum to be achieved. This is something we advocated in response to the previous call for inputs and we are pleased to see that Ofcom has brought forward proposals.

Question 1: Do you have any comments on our proposals to gather additional antenna parameters, and would you prefer Ofcom to specify a small number of antenna pattern 'envelopes' or for users to provide details of the specific antenna parameters in use for Ofcom to assess? Please provide reasons for your views.

We agree that Ofcom should require applicants to provide information on the base station antenna radiation patterns, pointing direction and any antenna down tilt. If this information is used for the frequency coordination it would logically need to form part of the technical conditions that are in the licence schedules (provided there is an opportunity for future review and/or amendment). We think it is necessary to require the information, rather than just give the option to provide it. The absence of detailed information would be to the detriment of subsequent applicants who may not achieve successful coordination but might have done so if existing systems had been more accurately characterised in terms of ability to cause, or their immunity to, interference.

We would suggest that Ofcom requires users to supply specific antenna information for their proposed deployments, specifying the expected vertical and horizontal antenna radiation pattern envelopes and peak gain.

Ofcom could, for example, provide a spreadsheet template for applicants to fill out to specify the antenna gain at given angles from the direction of the main beam. Ofcom could hold a library of these antenna patterns and where an applicant is using an antenna that already has been included in Ofcom's system this could be selected instead of uploading a new pattern.

We can provide examples of measured radiation patterns (V and H plane) for typical equipment we use today if required.

More support for user-led coordination agreements

Question 2: Do you have comments on the suggested approach to enable user-led coordination in certain circumstances?

BT supports the proposed user-led coordination process as set out in the consultation document. We look forward to seeing more detailed guidance if Ofcom proceeds with its proposal. This should not lead to any increased interference to existing or

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

[2] https://www.ofcom.org.uk/__data/assets/pdf_file/0017/272051/Consultation-Shared-Access-Licence.pdf

new users that has not been agreed to and should enable more efficient use of the spectrum and enable some projects to proceed that might otherwise not be possible.

Low power increase in 3.8 – 4.2 GHz

Question 3: Do you have any comments on our proposal to increase the power level of our Low Power product by 3dBm in the 3.8-4.2 GHz band?

BT supports Ofcom's proposal to increase the power level of the Low Power product by 3 dBm in the 3.8 – 4.2 GHz band. This should improve the viability of certain deployments and be more compatible with some equipment that is available on the market today. We note that in the draft licence schedules it is not stated that the power levels are EIRP and it might be useful to state that explicitly if that is Ofcom's intention.

Relaxing the requirement for records of terminals in 3.8 –4.2 GHz

Question 4: Do you have any comments on our proposal to remove the requirement for licensees holding a Low Power 3.8-4.2 GHz licence to keep a record of the address at which mobile terminals connected to an indoor base station will be used?

Ofcom explains that its proposal could extend the commercial opportunities for neutral hosts, although we presume Ofcom would make the spectrum available on a fair, transparent and non-discriminatory basis. We note that the proposed removal of the requirement for recording the number of mobile terminals and the address where they are used would be relevant also to use of 3.8-4.2 GHz directly by MNOs. ✂ This could represent an efficient use of the spectrum. On this understanding we could agree with Ofcom's proposal but would suggest that Ofcom considers how excess demand in some locations might be managed fairly.

3 Updated coordination rules

Question 5: Do you agree with our proposals to assume synchronisation between users, and coordinate base station to terminal instead of base station to base station in the 3.8-4.2GHz band? If no, please explain how other measures could increase sharing of the band.

BT recognises that assuming systems are synchronised, and consequently applying less onerous interference threshold for frequency coordination, should enable more systems to be deployed and should support more efficient use of the 3.8 – 4.2 GHz band. Ofcom proposes not to distinguish between existing and new systems in the updated coordination process.

We suggest Ofcom should instead consider two different scenarios and develop rules accordingly:

- The first is where an incoming system would successfully coordinate with nearby existing systems using the present rules where base station to base station interference is considered (i.e., a worst-case scenario in an unsynchronised deployment). In this case existing deployments are not affected by the newcomer.
- The second scenario is where an incoming system would only successfully coordinate with nearby existing deployments using relaxed interference thresholds associated with an assumed synchronised use scenario. In this case the existing deployments could be adversely impacted by the incoming system.

In our view, in the second scenario above, the newcomer should synchronise with the existing deployment that would otherwise suffer interference, potentially invoking the user-led coordination process that Ofcom has separately proposed. Once deployed, if any existing system that was part of an agreed user-led coordination agreement changes its frame structure, the agreement would need to be obtained once more.

Question 6. Please indicate whether you support our preferred option of coordination at -88 dBm/20 MHz (based on I/N of + 3dB, at 1.5m) or a more conservative alternative of -91 dBm/20 MHz (based on I/N of 0dB at 3m), with reasons for your view.

BT does not have strong views either way on which of the two interference thresholds is more appropriate.

Question 7: Do you agree with our proposals for an increase in BEL in 3.8-4.2GHz? If no, are there alternatives which you consider could better achieve similar results?

We have no objection to Ofcom's proposal to assume a building entry loss of 14 dB for the purpose of frequency coordination of indoor to outdoor systems in the 3.8 – 4.2 GHz band.

Question 8: Do you agree with our proposal that adjacent band protection for Shared Access users is in future limited to considering only the first 5 MHz above and below UK Broadband assignments?

Yes, we agree with Ofcom's proposal.

4 Options for revising fees in 3.8 - 4.2 GHz to enable more sharing

Question 9: Do you agree with our assessment that, in circumstances where localised shortages of spectrum have occurred, pricing can be used to influence requested spectrum amounts?

BT does not agree that introducing incentive-based spectrum fees that are significantly higher than the present cost-based fees is necessary, proportionate or appropriate to promote efficient use of the shared access spectrum at the present time. Existing use of the spectrum is very modest and with the enhancements to the coordination process that Ofcom proposes we think it is unlikely that congestion will occur, or that higher licence fees will result in more efficient use.

✂

We suggest that Ofcom reconsiders the possible introduction of incentive-based spectrum pricing in 3 years' time when there is more experience of how the band is used and the extent of any congestion that materialises.

Question 10: Do you agree that we should take measures to reflect the impact of bandwidth, power levels and urban/rural location in our pricing approach for the 3.8- 4.2 GHz band? Do you think there are other factors we should be taking into account?

The indicative proposals that Ofcom has set out would be problematic as they stand.

If Ofcom were ultimately to decide that it will go ahead and move away from cost-based fees, the following points should be considered:

- Contractual arrangements between operators and their customers are unlikely to enable unforeseen additional large increases to spectrum costs to be passed to these customers, risking the commercial viability of projects. Therefore, measures (exemption or long phase-in period) should be applied in the case of applying new fees to existing deployments.
- The additional sterilization zone from an additional transmitter or receiver in the same approximate area (e.g. a Port) would be a far smaller area than the total of the aggregated sterilization areas of such transmitters/receivers had they each been located in completely different places. Therefore, where there are several licensed base stations run by an operator on the same site and on the same channel frequency, any fees should be discounted to reflect the fact that much of the interference generated will be self-interference and the sterilizing effect due to interference from, or the need to protect, these would be less than if multiple different frequencies had been used at multiple different locations.

Finally, it is unclear why the illustrative fees should not scale linearly with bandwidth, as is the current practice with mobile and fixed links.

Question 11: How do you consider the illustrative prices would impact your spectrum requirements and future deployment plans in the 3.8-4.2 GHz band? Please provide evidence in support of your view.

The illustrative fee levels for medium power licences in urban areas (where deployments would need to pass Ofcom's exceptions process) represent a 1250% increase on current fees. Fees charged at this level would most likely make many existing projects commercially unviable and new projects that would generate large benefits might not go ahead as the result of the high fees. This could leave spectrum unused in many instances and therefore achieve less rather than more efficient use of spectrum.

5 Exceptions and future opportunities

Question 12: Do you have any comments on our proposals to clarify the circumstances in which exceptions are available, the tests we will apply, and how this supports user flexibility outside our overarching rules?

Question 13: Do you agree with our overall approach based around refining our existing coordination framework for Shared Access, whilst monitoring future opportunities for more user led and outcomes led coordination where evidence suggests it would be of benefit?

We have no additional comments on Ofcom's proposals.

6 Legal tests, impact assessments and next steps

Question 14: Do you agree with our assessment of the potential impact on specific groups of persons?

We have no comments.

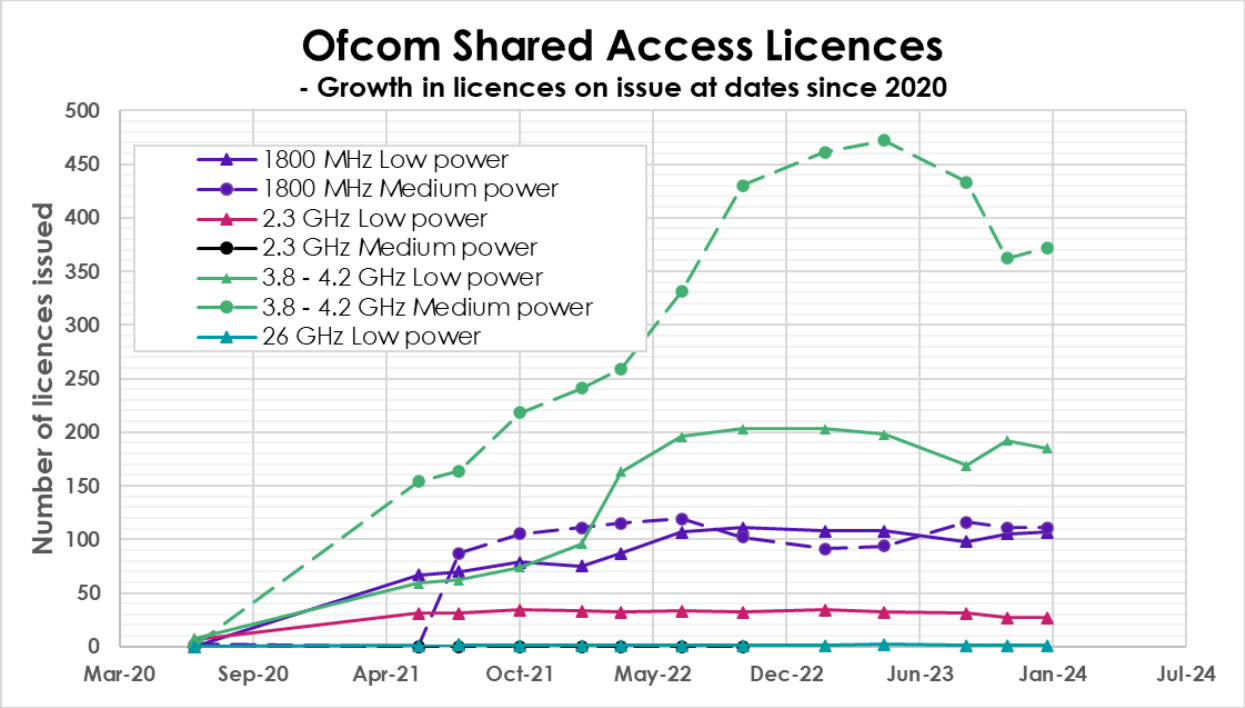
Question 15: Do you agree with our assessment of the potential impact of our proposal on the Welsh language? Do you think our proposal could be formulated or revised to ensure, or increase, positive effects, or reduce/eliminate any negative effects, on opportunities to use the Welsh language and treating the Welsh language no less favourably than English?

We have no comments.

Question 16: Do you have any other comments on the proposals set out in this document?.

The take-up of shared access licences has been relatively modest to date and the spectrum already available, if efficiently managed, should provide the required capacity for considerable growth. We have noted from our analysis of the Wireless Telegraphy Register, as shown in Figure 1, that the growth in the 3.8-4.2GHz licences has slowed (or even declined) in recent months. We do not suggest that licence numbers will not grow, but the current numbers do call in to question whether this is an efficient use of 400 MHz of prime mid-band spectrum, particularly when Ofcom has not yet identified further mid-band spectrum for national mobile networks within its mobile spectrum roadmap.

Figure 1 : Growth in use of the shared access spectrum bands



If current trends continue and it does not become more efficiently used, Ofcom should consider making it available for licensed use by national mobile network operators.

In order to plan for that possibility, we would encourage Ofcom to where feasible concentrate assignments towards one end of the band.

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