
Statement on the variation of 3.4 GHz, 3.5 GHz and 3.6 GHz Spectrum Access licences

Licence variations to give effect to European
Commission Decision 2019/235

STATEMENT

Publication Date: 25 June 2019

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1. Overview

Earlier this year, four operators (EE Limited, Hutchison, Telefonica, and Vodafone) requested changes (licence variations) to their spectrum licences in the 3410 MHz to 3680 MHz range. These changes would update the technical conditions in each licence to align them to the recent European Union (EU) Harmonisation Decision (the “EU Decision”) on the 3.4 GHz to 3.8 GHz band.¹

On 18 April 2019, we published a consultation document setting out a provisional view that we were minded to agree to the variation requests², noting that this would also be consistent with the proposed licence conditions for the 3.6 GHz to 3.8 GHz band (set out in our consultation document “Award of the 700 MHz and 3.6-3.8 GHz spectrum bands” (the “Award Consultation”).³

What we have decided – in brief

We are to vary the relevant spectrum licences (four Spectrum Access 3.4 GHz licences, one Spectrum Access 3.5 GHz licence and one Spectrum Access 3.6 GHz licence), in line with the EU Decision.

The EU Decision updates include the addition of new emissions limits for Active Antenna Systems (AAS) that are relevant to the deployment of 4G and 5G systems in the 3.4 GHz to 3.8 GHz frequency band. As 3.4 GHz to 3.8 GHz is a key frequency band for the delivery of 5G services in the UK, these technical changes should help to facilitate the rollout of high capacity 5G services in the future.

Ofcom believes the decision to vary the licences, as requested, is in line with our statutory duties to promote competition and encourage investment and innovation to further the interests of citizens and consumers.

This overview is a simplified high-level summary only. Our decision and reasoning are set out in full in the rest of this document.

¹ <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32019D0235&from=EN>

² <https://www.ofcom.org.uk/consultations-and-statements/category-3/proposal-vary-3.4ghz-radio-spectrum-licences>

³ <https://www.ofcom.org.uk/consultations-and-statements/category-1/award-700mhz-3.6-3.8ghz-spectrum>

2. Variation requests and consultation responses

2.1 This section provides information regarding the six licence variation requests and the responses we received to our consultation.

Licence variation requests

2.2 Four licence holders (EE Limited, Hutchison, Telefonica, and Vodafone) hold spectrum licences which authorise them to use radio spectrum in 3410 MHz to 3680 MHz range. EE Limited, Telefonica and Vodafone each hold a Spectrum Access 3.4 GHz licence. Hutchison (and its wholly owned subsidiary UK Broadband) holds three licences, a Spectrum Access 3.4 GHz licence, a Spectrum Access 3.5 GHz licence and a Spectrum Access 3.6 GHz licence.

2.3 Earlier this year these licensees requested variations to update the technical conditions in each licence to align them to the recent EU Decision on the 3.4 GHz to 3.8 GHz band.⁴ The variation requests were also consistent with Ofcom's proposed approach in the Award Consultation for the 700 MHz and 3.6-3.8 GHz spectrum bands.⁵

2.4 The licensees requested that Ofcom:

- a) Add to the special conditions relating to Radio Equipment to accommodate a new Total Radiated Power (TRP) in-block and out-of-block power limits for AAS.
- b) Raise the terminal power limits from 25 dBm to 28 dBm TRP.
- c) Remove the band edge requirement above 3605 MHz and replace it with a requirement at 3800 MHz and above.

2.5 As part of the variation process EE Limited also requested that its licence retain the existing licence definition for the term PMax and that this definition apply for the out of band emissions and out of block emissions below 3.4 GHz.⁶

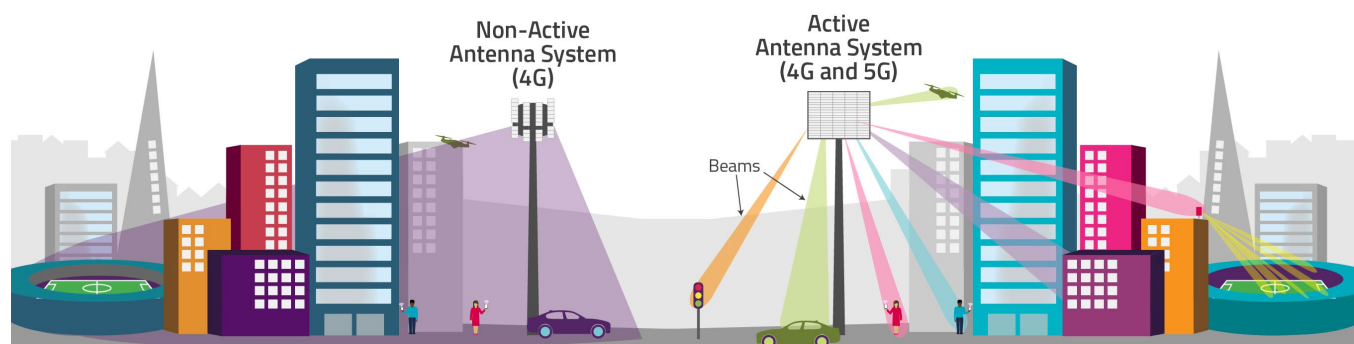
2.6 The licence variations will facilitate the deployment of AAS in each licensee's mobile network alongside the technologies that currently exist.

⁴ <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32019D0235&from=EN>

⁵ <https://www.ofcom.org.uk/consultations-and-statements/category-1/award-700mhz-3.6-3.8ghz-spectrum>

⁶ Any future trading of the EE limited licence in the 3.4 GHz to 3.6 GHz band would mean that this licence was not aligned with the terms of spectrum in other traded licences.

Figure 1: AAS and beamforming



2.7 On 18 April 2019, we published a consultation document setting out a provisional view that we were minded to agree to the variation requests.⁷

Consultation responses

2.8 In response to the consultation document, we received eight stakeholder submissions from Hutchison/UK Broadband, Telefónica, Vodafone, Ericsson, UKWISPA/INCA, Ben Hamilton and two confidential responses. All non-confidential responses were published on our website, following the close of the consultation period on 19 May 2019.

2.9 Stakeholders responded to three question:

Q1 - Do you agree with Ofcom's proposal to vary the licences as requested? If not, please explain why you think it would not be appropriate to vary the licences.

Q2 - Do you have any other comments on the assessment or the factors considered as part of the assessment?

Q3 - Do you have any comments on the technical changes?

Summary of responses

2.10 All eight stakeholder responses agreed with our proposals to amend the licences as requested.

2.11 UKWISPA/INCA, while supporting the variations, raised concerns that Ofcom's proposals and assessment did not factor in how AAS might impact on specific absorption rate (SAR) limits and human exposure to electromagnetic field (EMF) emissions.

2.12 In addition, Ericsson asked Ofcom to clarify whether small cell deployments in the 3.4 GHz to 3.6 GHz band need to adhere to the limits described in the out of band edge requirements proposed.⁸

⁷ <https://www.ofcom.org.uk/consultations-and-statements/category-3/proposal-vary-3.4ghz-radio-spectrum-licences>

⁸ These requirements were described in paragraph 14 of the draft licence published in our consultation document.

Our response

Stakeholder comments on technical changes - SAR and EMF

- 2.13 Public Health England (PHE) is responsible for advising the UK Government on EMF safety limits and central to PHE's advice is that exposure to radio waves should comply with the limits set out in the guidelines laid down by the International Commission on Non-Ionizing Radiation Protection (ICNIRP). Ofcom regulates the operation of mobile networks in relation to their use of radio frequencies (in this case the 3.4 GHz to 3.6 GHz band). We do not make recommendations on human exposure to EMF emissions or SAR limits as contemplated in UKWISPA/INCA's consultation response. However, when setting licence conditions or technical specifications, we are mindful that these should not be inconsistent with the ICNIRP guidelines.
- 2.14 Mobile Network Operators (MNOs) are responsible for ensuring that their base stations comply with the ICNIRP guidelines. As and when the MNOs upgrade their networks to deploy AAS technology, they must continue to ensure their mobile base stations stay within the limits set out in the ICNIRP guidelines.
- 2.15 For mobile phones, manufacturers are responsible for ensuring that their devices meet the essential requirements of the Radio Equipment Directive. This includes ensuring the protection of health and safety of persons. Thus, all mobile phone equipment on the market must meet the ICNIRP SAR limits irrespective of the maximum transmit power limits set out in our licences.

Stakeholder comments on technical changes - Small cell clarification

- 2.16 All small cell deployments need to adhere to the emission limits and the out of block edge requirements proposed in paragraph 14 of the licence. This is to protect airborne radars below 3390 MHz.
- 2.17 Ericsson's submission raised matters that were not directly related to the consultation and were not requested by the licensees. Accordingly, Ofcom has not addressed these matters in this statement.

3. Decision

- 3.1 In this section we set out our assessment of the licence variation requests and our decision that it is appropriate to grant the requested changes. For the reasons explained below, we consider that it is in the best interests of consumers for Ofcom to vary the licences.

Ofcom's legal framework

General duties

- 3.2 Section 3 of the Communication Act 2003 (the "2003 Act") states the general duties of Ofcom. Under section 3(1) it is the principal duty of Ofcom in carrying out its functions:

- to further the interests of citizens in relation to communications matters; and
- to further the interests of consumers in relevant markets, where appropriate by promoting competition.

- 3.3 In doing so, Ofcom is required to secure, amongst other things (under section 3(2)):

- the optimal use for wireless telegraphy of the electro-magnetic spectrum; and
- the availability throughout the UK of a wide range of services.

- 3.4 In performing its duties, Ofcom must have regard to, amongst others, the following matters:

- the desirability of promoting competition (section 3(4)(b));
- the desirability of encouraging investment and innovation (section 3(4)(d));
- the desirability of encouraging availability and use of broadband services throughout the UK (section 3(4)(e)); and
- the different needs and interests of persons in different parts of the UK (section 3(4)(l)).

Duties when carrying out its spectrum functions

- 3.5 In carrying out its spectrum functions it is the duty of Ofcom (under section 3 of the Wireless Telegraphy Act 2006 (the "2006 Act")) to have regard in particular to:

- the extent to which the spectrum is available for use or further use, for wireless telegraphy;
- the demand for use of that spectrum for wireless telegraphy; and
- the demand that is likely to arise in future for the use of that spectrum for wireless telegraphy.

- 3.6 It is also the duty of Ofcom to have regard, in particular, to the desirability of promoting:

- the efficient management and use of the spectrum for wireless telegraphy;
- the economic and other benefits that may arise from the use of wireless telegraphy;
- the development of innovative services; and
- competition in the provision of electronic communications services.

3.7 Where it appears to Ofcom that any of its duties in section 3 of the 2006 Act conflict with one or more of its general duties under sections 3 to 6 of the 2003 Act, priority must be given to its duties under the 2003 Act.

3.8 The decision to make the variations is made in light of Ofcom's general and spectrum specific duties.

Powers to vary a spectrum licence

3.9 Ofcom's powers to carry out its spectrum management functions are set out in the 2006 Act. Under sections 9 and 10, the powers include the general power to revoke or vary any wireless telegraphy licences which authorise the use of spectrum frequencies, subject to such terms, provisions and limitations as Ofcom thinks fit.

3.10 Schedule 1 of the 2006 Act sets out a process for the variation of wireless telegraphy licences. Ofcom can vary spectrum licences, either on its own instigation or as a result of a licence variation request from a licensee. Here, we are dealing with direct request from four licensees.

3.11 In each case, Ofcom must decide whether varying a licence would give effect to its statutory duties and must act in accordance with the applicable procedures set out in the 2006 Act which apply to licence variations.

3.12 Ofcom has a duty set out in section 9(7) of the 2006 Act to ensure that wireless telegraphy licence conditions are objectively justified in relation to networks and services to which they relate, non-discriminatory, proportionate and transparent. Ofcom considers that this obligation is ongoing and must be assessed against market circumstances and the state of technology development at the time.

3.13 Ofcom has a broad discretion under paragraph 6 of Schedule 1 of the 2006 Act to vary licences, subject to certain limitations:

- pursuant to paragraph 6A of Schedule 1 of the 2006 Act, any variation of a wireless telegraphy licence must be objectively justifiable;
- UK obligations under European law or international agreements where use of spectrum has been harmonised: Ofcom will not agree to remove restrictions from licences or other changes that would conflict with the UK's obligations under international law;
- section 5 of the 2003 Act and section 5 of the 2006 Act enable the Secretary of State to give directions to Ofcom in respect of the carrying out of our spectrum functions;
- Ofcom must act in accordance with its statutory duties, including the duty to secure optimal use of the spectrum, our duties under section 3 of the 2006 Act and obligations under the European Common Regulatory Framework and the European Electronic Communications Code; and
- general legal principles, which include the duties to act reasonably and rationally when making decisions and to take account of any legitimate expectations.

3.14 Under Schedule 1 of the 2006 Act, in cases where a variation is proposed by the licensee, we are under no obligation to consult on the proposal. However, Section 7 of the 2003 Act

provides that where we are proposing to do anything for the purposes of, or in connection with, carrying out our functions, and it appears to us that the proposal is important, then we are required to carry out and publish an assessment of the likely impact of implementing the proposal, or a statement setting out our reasons for thinking that it is unnecessary to carry out such an assessment. Where we publish such an assessment, stakeholders must have an opportunity to make representations to us about the proposal to which the assessment relates.

- 3.15 We consider that the variation requested by the four licensees was important for the purposes of section 7 of the 2003 Act. Therefore, we decided to consult on the proposed requests and our provisional conclusion that it was appropriate to grant the variation. The consultation gave licensees and the public an opportunity to make representations.

Assessment

- 3.16 The radio spectrum is a finite national resource of considerable economic and social value. In our assessment of the six licence variations, we have balanced the advantages and disadvantages of varying the licenses, in light of the relevant factors evidence and consultation submissions, in order to reach an outcome that most appropriately meets our relevant statutory duties.

Benefits for consumers and citizens

- 3.17 We have considered the extent to which varying the licence would:
- a) further the interests of consumers by, for example, encouraging innovation, investment and the availability and use of mobile services throughout the UK; and result in better choice, price, quality of service and value for money; and/or
 - b) give rise to a material risk of a distortion of competition to the detriment of consumers such that any benefits to consumers resulting from varying those licences without delay would be outweighed by the detriment to consumers resulting from such a distortion of competition.
- 3.18 In accordance with our duties, we want to ensure that consumers and businesses continue to benefit from strong competition in the provision of mobile services. We believe the UK market is generally operating well with continuing innovation and relatively low prices compared to other markets internationally.
- 3.19 Consumers should benefit from the licence variations, as they are likely to lead to higher quality enhanced mobile broadband services being available, due to licensees being able to more optimally use the spectrum they have. The licence variations may lead to product innovation which should enables consumers to benefit from higher quality, greater functionality, speed or flexibility from the products and services they purchase.
- 3.20 Consumers may also benefit from improved 4G and new 5G services being available earlier, although this is less certain. The EU Decision implemented through the licence variations harmonises the technical conditions for both non-AAS and AAS, facilitating these

technologies alongside existing ones rather than mandating any particular technology. This means when investment is made, network deployments should be able to meet consumer demand, particularly for increasing capacity for mobile broadband services, and to enable the industry to take advantage of innovation opportunities.

- 3.21 The variations are for six licences held by the four MNOs. We do not consider the variations to have an adverse impact on competition and would also assist with the promotion of competition between MNOs or any other licensees in the 3.4 GHz to 3.8 GHz band.

Spectrum use and interference in the same or adjacent bands

- 3.22 Finally, we have considered whether the variations would have an adverse competitive impact on other spectrum users, and have concluded that they would not.
- 3.23 The changes to technical conditions of the licences do not impact the spectrum quality of existing Permanent Earth Station and Fixed Links licensees or holders of grants of Recognised Spectrum Access for Receive Only Earth Stations in the 3.6 GHz to 3.8 GHz band. This is primarily due to continued coordination of MNO deployments. Specifically, the more permissive out of band emissions mask in the new technical requirements are to be included in the existing coordination tool, and licensees will continue to be required to abide by the existing coordination procedure for new sites and for changes to existing sites. The varied licences permit the deployment of AAS in a manner consistent with the EU Decision and we consider these appropriate for coexistence with other users of the spectrum, including Earth Station and Fixed Link licensees.

Conclusion

- 3.24 Overall, consumers are likely to benefit from the licence variations because we believe they promote competition (at worst they would be neutral for competition). This could be achieved with new product/service innovations and through higher quality mobile services being made available. We also expect an optimal spectrum use on the part of licensees and a low likelihood of any interference effects, out of band, for spectrum users operating inside or adjacent to the 3.4 GHz to 3.6GHz band.

Decision

- 3.25 Having considered the comments made by stakeholders, we have decided, in light of our relevant spectrum management functions and statutory duties, to grant the variations. We consider that granting the licence variations meets our duties to further the interests of citizens and consumers, to secure optimal use of the spectrum, to promote competition, and to promote the efficient management and use of the spectrum.
- 3.26 We note that the requested changes align the licences with the EU Decision on the 3.4 GHz to 3.8 GHz band and that the removal of the protective restrictive emission above 3605 MHz has been flagged in previous Ofcom consultations.

3.4 GHz, 3.5 GHz and 3.6 GHz Licence Variations

- 3.27 We believe that the licence variations contribute to our broader aims of ensuring that regulation does not prove an impediment to innovation in 5G. Our decision assists licensees with the deployment of improved 4G and 5G infrastructure involving AAS in the 3410 MHz to 3680 MHz band. Without these licence variations, the licensees would be limited in the way they could deploy improvements to their mobile networks and this could slow or impede 5G innovation.