



UK Broadband application for licence variation

Consultation

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Section 1

Executive summary

- 1.1 UK Broadband Limited ('UK Broadband') has submitted a request to Ofcom to vary its Wireless Telegraphy Public Fixed Wireless Operator 3.5 GHz¹ licence ('3.5 GHz licence') in two ways:
- to allow technology and application neutrality; and
 - to increase the permitted power limits.
- 1.2 This document assesses UK Broadband's request and in doing so
- provides background information on the 3.5 GHz band and UK Broadband's licence;
 - sets out Ofcom's statutory and policy framework;
 - considers the engineering effects of increased power levels, including the potential for interference to other users; and
 - considers UK Broadband's request in the light of Ofcom's statutory and other legal duties.
- 1.3 The main points of Ofcom's assessment are:
- UK Broadband's licence does not limit the technologies it may use;
 - there appears to be no reason for Ofcom to refuse the variation of UK Broadband's licence to remove the limitation to fixed applications;
 - on power limits, Ofcom's conclusion is that there appear to be no reasons for it to refuse to increase the maximum in-band power level to +29 dBW/MHz for all stations except mobile terminals, which should have a maximum in-band power limit of -5 dBW/MHz; and
 - Ofcom considers that it is not appropriate at this time to consider varying the out of block emission limits in UK Broadband's licence, because of the current uncertainty regarding equipment standards and the impact ongoing work within CEPT on the WAPECS Mandate could have on the technical regulatory environment for the 3.5 GHz band.
- 1.4 Ofcom's initial view is that the variation should be made as soon as practicable, subject to the outcome of this consultation.
- 1.5 Ofcom wishes to make clear that it has not reached a decision on these matters and is seeking stakeholders' views on UK Broadband's request. It will carefully consider any arguments and comments made in response to this consultation before reaching a final decision.

¹ While the original award was called the "3.4GHz Public Fixed Wireless Access Auction", the majority of the frequency range lies within, or close to, the 3.5 GHz band. To avoid future confusion, Ofcom hereafter refers to this as "the 3.5 GHz band".

- 1.6 Ofcom is asking stakeholders to consider the following question when responding to this consultation:

Do you agree that the case for making changes requested by UK Broadband to its licence has been made? If not, why would it not be appropriate to vary UK Broadband's Wireless Telegraphy Public Fixed Wireless Access Operator Licence by (i) allowing application neutrality and (ii) increasing the permitted maximum in-band EIRP, and why would it not be appropriate to vary the licence as soon as practicable?

Section 2

Introduction

2.1 This document consults on Ofcom's consideration of an application from UK Broadband to vary its 3.5 GHz licence. UK Broadband submitted a request to Ofcom on 6 March 2007 to vary its licence in two ways:

- to allow technology and application neutrality; and
- to increase the allowed power levels.

2.2 The documents comprising UK Broadband's application are at Annex 8.

Ofcom's approach to spectrum management

2.3 Ofcom's general approach to spectrum management has been set out in a number of documents, including:

- the Spectrum Framework Review consultation document published in November 2004 ('SFR') and Statement published in June 2005 ('SFR Statement')²;
- the Spectrum Trading consultation document published in November 2003 ('Trading Consultation Document') and Statement published in August 2004 ('Trading Statement')³; and
- the Spectrum Liberalisation consultation document published in September 2004 ('Liberalisation Consultation Document') and Statement published in January 2005 ('Liberalisation Statement')⁴.

Implementation of Ofcom's liberalisation policy

2.4 Ofcom is implementing its policy of liberalisation in the following ways:

- publishing a list of specific licence variations that are considered to be intrinsically unproblematic and to which Ofcom would therefore normally expect to be able to agree;
- varying individual licences following requests for change of use from licensees;
- varying some entire classes of existing licences to make them less usage and technology specific;
- publishing guidance for licensees about the levels of interference which they might tolerate and which will be a key criterion in deciding whether or not to allow the removal or reduction of restrictions.

² <http://www.ofcom.org.uk/consult/condocs/sfr>

³ http://www.ofcom.org.uk/consult/condocs/spec_trad/

⁴ <http://www.ofcom.org.uk/consult/condocs/liberalisation>

- 2.5 In its Spectrum Liberalisation Guidance Notes⁵ Ofcom provided information on the procedures for reducing or removing licence restrictions on spectrum use. Ofcom said that some requests for complex or novel variations might require detailed analysis, consultation with third parties and international co-ordination. In some cases Ofcom may find that liberalisation raises concerns about efficiency and competition that need to be addressed through regulatory intervention. One such case may be the liberalisation of 2G spectrum licences; Ofcom is planning to consult on this case in forthcoming months.

Matters covered in this document

- 2.6 This document is structured as follows:
- Section 2 sets out background on the 3.5 GHz band and the UK Broadband licence, statements that the Radiocommunications Agency made in 2003 at the time of the auction of 3.5 GHz licences about the applications that the licences permitted and Ofcom's consideration in the Spectrum Framework Review: Implementation Plan of the removal of restrictions from UK Broadband's licence.
 - Section 3 sets out Ofcom's statutory duties and explains Ofcom's approach to spectrum liberalisation and the variation of licences.
 - Section 4 sets out Ofcom's assessment of the potential for interference from increasing the maximum permissible power level in UK Broadband's licence and explains why at this stage Ofcom does not consider it appropriate to vary the out of block emission limits in the licence.
 - Section 5 sets out Ofcom's assessment against its statutory and other legal duties of the variation of UK Broadband's licence to make it application neutral and to permit a higher in-band power level.
 - The annexes include a copy of UK Broadband's licence, including the proposed changes to it if the variation is made, an impact assessment and a copy of UK Broadband's application.

⁵ <http://www.ofcom.org.uk/radiocomms/ifi/trading/libguide/>

Section 3

Background information on the 3.5 GHz band and UK Broadband's licence

3.1 This section describes the regulatory position on the 3.5 GHz band (3.4-3.6 GHz), part of which UK Broadband is licensed to use, the main features of UK Broadband's licence, statements that the Radiocommunications Agency (RA) made about the scope of the licence at the time of the 2003 auction of licences in the band and Ofcom's consideration in its Spectrum Framework Review: Implementation Plan of the removal of some restrictions from the licence.

3.5 GHz band – international and UK regulatory position

3.2 In ITU Region 1, which includes Europe, the frequency bands 3400-3600 MHz and 3600-3800 MHz are allocated to the fixed service and to the fixed-satellite service (space-to-Earth) on a primary basis and to the mobile service on a secondary basis. The revised European Common Allocation Table (ECA), which was agreed at the May 2007 meeting of ECC Working Group Frequency Management (WG FM), shows that the frequency band 3400-3800 MHz is also allocated on a primary basis to the mobile service. The ECA, as revised, indicates that the major co-primary use of the 3.5 GHz band is for broadband wireless access (BWA) and co-ordinated programme making and special events applications for occasional use. In 1998 the 3.5 GHz band was identified as a preferred frequency band for fixed wireless access (see ERC/REC13-04 and ERC/REC14-03)⁶.

3.3 In March 2007 the Electronic Communications Committee adopted a Decision (ECC/DEC/(07)02⁷) that designated for BWA deployment the spectrum within the band 3400-3600 MHz and/or 3600-3800 MHz, subject to market demand and with due consideration of other services deployed in these bands. The Decision says that administrations shall consider allowing flexible usage modes within authorised BWA deployments in these frequency bands, taking into account the considerations in the Annex to the Decision. 'Flexible usage modes' means licence conditions that allow the deployment of various types of terminal stations – fixed, nomadic or mobile.

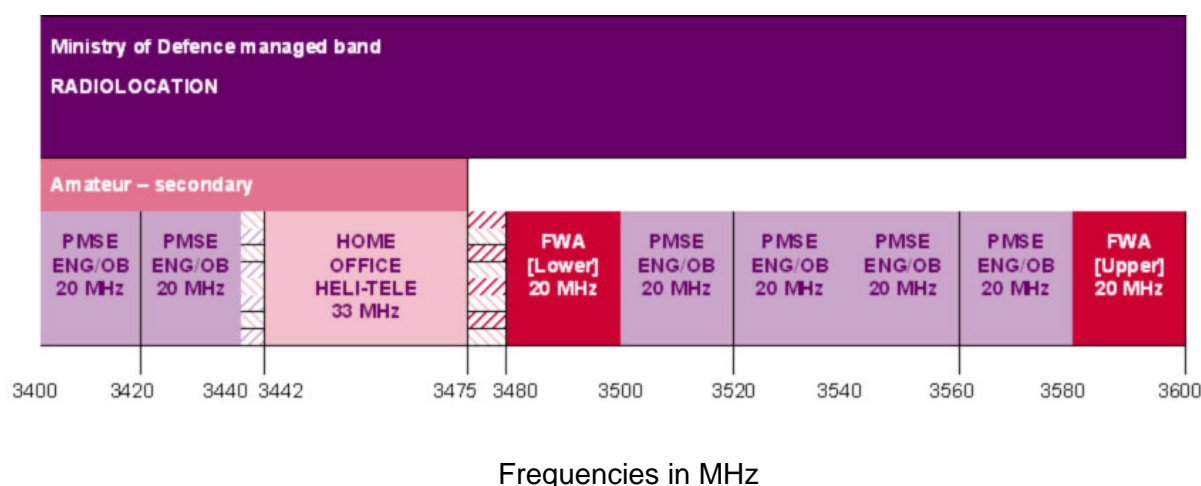
3.4 The 3.4-3.8 GHz band is one of those being considered within the European Union's WAPECS (Wireless Access Policy for Electronic Communications Services) project. WAPECS is a proposed framework for the provision of electronic communications services within a set of frequency bands to be identified and agreed between European Union Member States for communications services that may be offered on a technology and service neutral basis, provided that certain technical requirements to avoid interference are met. In July 2006 the European Commission issued a mandate to CEPT to develop least restrictive technical conditions for the relevant bands and to report by 29 July 2007.

⁶ <http://www.ero.dk/documentation/docs/doc98/official/Word/REC1304E.DOC>;
<http://www.ero.dk/documentation/docs/doc98/official/Word/REC1403E.DOC>

⁷ ECC Decision of 30 March 2007 on availability of frequency bands between 3400-3800 MHz for the harmonised implementation of Broadband Wireless Access systems (BWA)(ECC/DEC/(07)02) see <http://www.ero.dk/documentation/docs/doc98/official/Word/ECCDEC0702.DOC?frames=0>

- 3.5 The 3.5 GHz (3.4-3.6 GHz) band is allocated in the UK to the Ministry of Defence (MOD). By agreement with MOD in 2001, the Radiocommunications Agency (RA) took over management of the 2x20 MHz of spectrum within the band that it planned to authorise for fixed wireless access for a period of 15 years from the commencement of licences. Ofcom anticipates that MOD will consider a request for modification to the position so that the licences are no longer restricted to fixed wireless access.
- 3.6 Parts of the band are also used by the Home Office and for Electronic News Gathering (ENG), Outside Broadcasts (OB) and programme making and special events (PMSE) managed by JFMG Ltd . The band plan is shown below.

3.4 - 3.6GHz Band Plan



UK Broadband's licence

- 3.7 RA auctioned 15 regional 3.5 GHz Public Fixed Wireless Access Operator licences in June 2003 (the '2003 auction'). The 15 regions together comprised the whole of the UK. Following the auction Pound Radio was awarded on 17 July 2003 a licence for 13 of the regions. Shortly afterwards this company changed its name to UK Broadband. It also purchased the companies that had won the other two licences. The licences authorise UK Broadband to operate radio equipment in the frequency ranges 3480-3500 MHz and 3580-3600 MHz.
- 3.8 In December 2006 UK Broadband asked Ofcom to vary its three licences so that all 15 regions were covered by a single licence. On 19 March 2007 Ofcom agreed to the replacement of these three licences with a single UK licence and subsequently issued a revised licence. Apart from some updating of the licence, for example to reflect the replacement of the Wireless Telegraphy Act 1949 by the Wireless Telegraphy Act 2006, the licence conditions are effectively identical to those in the licences granted in July 2003.
- 3.9 UK Broadband's licence authorises the establishment, installation and use of Public Fixed Wireless Access transceivers. The end user terminals included in this term are limited to customer premises equipment. The licence also stipulates a maximum eirp of +14 dBW/MHz, though the Interface Requirement (IR 2015) with which the licensed equipment must comply says that +21 dBW/MHz may be considered on a case-by-case basis (e.g. for backhaul purposes using narrow beam antennas). The licence does not impose any limitation on the technology that UK Broadband may use.

- 3.10 The licence is for an initial term of five years renewable at five year intervals up to a maximum 15 years. UK Broadband has recently informed Ofcom that it wants to exercise its option to extend the term for the second five year period from July 2008. The licence fee payable for each five year licence term is £6.955 m.
- 3.11 A copy of UK Broadband's current licence is at Annex 7.

Radiocommunications Agency statements made before the 2003 auction

- 3.12 Before the 2003 auction RA made a number of public statements that are relevant to the variation of the licences awarded following the auction and to the usage restrictions in the licences. These were contained in the information memorandum (IM) on the award, which was published in March 2003 and in response to questions put to RA.

Statement in the IM about licence variation

- 3.13 Paragraph 2.2.3 of the IM covers variation and revocation. It says:

'The circumstances under which a WT Act Licence may be varied or revoked are set out in paragraph 4 of the template WT Act Licence in Appendix I. Where the Secretary of State proposes to vary or revoke a WT Act Licence, she must follow the procedure in the WT Acts. She must give notice to the licensee, stating the reasons for the proposed variation or revocation, and must allow representations to be made for a period of at least 28 days.'

The template Licence also states that it may be varied at the request of, or with the consent of, the Licensee.

The IM can be found at

<http://www.ofcom.org.uk/static/archive/spectrumauctions/pfwa/index.htm>

Responses to questions: Public statements at the time of the auction

- 3.14 There were two questions put to RA that are relevant:

54. Mobile services – could the spectrum licences be used for the provision of mobile services to persons travelling on public transport?

RA's response was - The UK has allocated the bands 3480-3500/3580-3600 MHz on a primary basis to fixed services for fixed wireless access.

Fixed services are defined as "a radiocommunication service between two specified fixed points" (International Telecommunication Union Radio Regulations Article RR1.20).

The provision of services to persons travelling on public transport would be defined as a mobile service, that is "a radiocommunication service between mobile and land stations, or between mobile stations" (International Telecommunication Union Radio Regulations Article RR1.24). Mobile stations are defined as "a station in the mobile service intended to be used while in motion or during halts at unspecified points" (International Telecommunication Union Radio Regulations Article RR1.68). A land station is defined as "a station in the mobile service not intended to be used while in

motion” (International Telecommunication Union Radio Regulations Article RR1.69).

UK use of the bands 3480-3500/3580-3600 MHz for the purpose of providing services to persons travelling on public transport would as a consequence not be permitted in the UK.

73 Will government limit power levels from stations?

RA’s response was - Operators will be expected to comply with the power limits as set out in the UK interface requirements IR 2015 and any additional limitations specified in the FWA licences. Additional guidance will be provided for the purpose of inter-operator co-ordination.

- 3.15 All frequently asked questions can be found at http://www.ofcom.org.uk/static/archive/ra/topics/pfwa/3-4ghz/docs/3_4ghzqanda30may2003.doc

Ofcom’s consideration of the removal of restrictions from UK Broadband’s licence in the Spectrum Framework Review: Implementation Plan

- 3.16 In the Spectrum Framework Review: Implementation Plan (SFR:IP)⁸, published on 13 January 2005, Ofcom consulted on proposals to apply Ofcom’s approach to spectrum management to a wide range of bands. It set out Ofcom’s thinking at the time on removing restrictions on the use of spectrum for mobile services. This covered, among other things, the considerations that might be relevant to the removal of restrictions from UK Broadband’s licence that limit it to offering only fixed services. Ofcom said (paragraph 8.18-8.28) that, in relation to the removal of restrictions from the UK Broadband licences, it would welcome views on two separate considerations:
- the wider arguments in favour of spectrum liberalisation - efficient spectrum use and the promotion of competition - in principle were as relevant to these licences as to any other spectrum; and
 - the fact that the licences were recently auctioned on the basis that the spectrum was for fixed services.
- 3.17 Ofcom said that one way of resolving these conflicting considerations might be to allow a suitable period of time to elapse before removing restrictions from the licences. This was a question that had wider relevance to other auctioned licences. What was a suitable period would depend on the significance of the licence variations, in the light of all relevant considerations. Ofcom suggested that one possibility might be to look towards the removal of usage restrictions from 2007. This would be three or four years after the auction, arguably sufficient time for any effects to have dissipated. It would also align with proposals on 2G and 3G and support the wider aim of an orderly transition from one spectrum management regime to another.
- 3.18 The questions that Ofcom posed were:
- whether it might be appropriate to allow a period of time to elapse following an auction before extending liberalisation to auctioned licences, both in general and with reference to particular auctioned licences such as 3.5 GHz; and,

⁸ <http://www.ofcom.org.uk/consult/condocs/sfrip/sfip/>

- if so, what would be the appropriate time before removing restrictions from the 3.5 GHz licences.

Responses to SFR: IP

3.19 Ofcom received 13 non-confidential responses that commented on these questions.⁹ They are summarised in the table in Annex 6, which also sets out Ofcom's position on the issues raised in the responses.

⁹ <http://www.ofcom.org.uk/consult/condocs/sfrip/sfip/responses/>

Section 4

Ofcom's duties and functions and spectrum liberalisation

4.1 This section provides a brief overview of the main UK and European legislative provisions relevant to wireless telegraphy licensing and to the requested variation. It does not provide a comprehensive statement of all legal provisions which may be relevant to Ofcom's functions and to wireless telegraphy licensing.

4.2 This section also explains Ofcom's approach to spectrum liberalisation.

Ofcom's general duties

4.3 Section 3 of the Communications 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:

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

In doing so, Ofcom is required to secure (under section 3(2)):

- c) the optimal use for wireless telegraphy of the electro-magnetic spectrum;
- d) the availability throughout the UK of a wide range of services;
- e) the availability throughout the UK of a wide range of TV and radio services which (taken as a whole) are both of high quality and calculated to appeal to a variety of tastes and interests;
- f) the maintenance of a sufficient plurality of providers of different television and radio services;
- g) the application in the case of all television and radio services of standards that provide adequate protection to members of the public from the inclusion of offensive and harmful material, unfair treatment in programmes and unwarranted infringement of privacy;

and to have regard to certain matters which include:

- principles of better regulation (section 3(3));
- 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));

- the different needs and interests of persons in different parts of the UK (section 3(4)(l)).

4.4 The management of the UK radio spectrum is governed by the European Communications Directives, which aims to harmonise the regulation of electronic communications networks and services throughout the European Union. Section 4 of the 2003 Act requires Ofcom when carrying out its spectrum functions to act in accordance with the “six community requirements” set out in that section when managing the wireless spectrum in the UK:

- a) The requirement to promote competition (section 4(3));
- b) The requirement to secure that Ofcom’s activities contribute to the development of the European internal market (section 4(4));
- c) The requirement to promote the interests of all persons who are citizens of the European Union (section 4(5));
- d) The requirement to act in a technology neutral way (section 4(6));
- e) The requirement to encourage to such extent as appropriate the provision of network access and service interoperability (section 4(7)); and
- f) The requirement to encourage such compliance with international standards as is necessary for (a) facilitating service interoperability; and (b) securing freedom of choice for the customers of communications providers (sections 4(9) and (10)).

Ofcom’s duties when carrying out spectrum functions

4.5 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:

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

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

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

4.6 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.

Ofcom's spectrum functions

4.7 Ofcom's powers to carry out these functions are set out in the 2006 Act. In summary Ofcom has the following powers:

- Section 8(1) of the 2006 Act gives Ofcom the power to grant licences to establish or use a wireless telegraphy station and to install or use wireless telegraphy apparatus. Ofcom has a general discretion under this provision to decide how to award a licence, including for example whether to use an auction mechanism (provisions in respect of which are set out in section 14 of the Act);
- Section 9 of the 2006 Act gives Ofcom the power to grant wireless telegraphy licences subject to such terms as Ofcom thinks fit.
- Schedule 1(6) of the 2006 Act gives Ofcom a general discretion to revoke or vary any wireless telegraphy licences by serving a notice in writing on the licence holder or by way of general notice to licensees in a class.

4.8 Ofcom has duty (set out section 9(7) of the 2006 Act which reflects Article 6 of the EU Authorisation Directive 2002/20/EC) 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.

4.9 Ofcom therefore has broad discretion under Schedule 1(6) of the Wireless Telegraphy Act 2006 to agree to vary licences but legal rules operate to limit that discretion. These legal rules include the following, in summary.

- 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. This includes changes in use or technology that would contravene binding Community measures, such as directives or harmonisation measures adopted under the Radio Spectrum Decision (676/2002/EC) and ITU Radio Regulations.
- Ofcom must comply with any direction from the Secretary of State under section 5 of the Communications Act 2003 and section 5 of the 2006 Act.
- Ofcom must act in accordance with its statutory duties, including the duty to ensure optimal use of the spectrum, the duty mentioned in paragraph 4.7 and obligations under the European Authorisation Directive (2002/20/EC).
- General legal principles, which include the duties to act reasonably and rationally when making decisions and to take account of legitimate expectations.

Spectrum liberalisation

4.10 The radio spectrum is a finite resource of considerable economic and social value. Ofcom where possible is moving to market-based mechanisms, including trading and liberalisation, that empower spectrum users to take more decisions on spectrum. Ofcom believes that this is likely to lead to optimal use of the radio spectrum.

- 4.11 Liberalisation, the removal or reduction of restrictions in licences, is central to this approach to spectrum management. Together with incentive pricing, auctions and spectrum trading, it makes spectrum available on a more flexible and dynamic basis for new wireless applications. It is also consistent with Ofcom's aim to deregulate or simplify regulation wherever possible.
- 4.12 The Liberalisation Consultation Document made clear that Ofcom has no intention of allowing an interference free-for-all to develop and would continue to investigate and resolve interference, although users would be expected to assume greater responsibility for planning their use of spectrum in accordance with the enhanced freedom that liberalisation would give them. The Document also explained the other constraints within which liberalisation would operate, including the legal rules described above that limit Ofcom's discretion to vary licences.
- 4.13 In considering requests for the variation of individual licences the factors that Ofcom will take into account include:
- impact on spectrum users in adjacent bands;
 - benefits for consumers and citizens;
 - optimal spectrum use;
 - impact on competition;
 - objective justification for licence conditions; and
 - legal considerations that limit Ofcom's discretion to vary licence conditions.

Section 5

UK Broadband's licence variation request and potential engineering effects

5.1 This section explains the licence variation that UK Broadband has requested, the engineering effects that would follow from making the variation, including the potential for interference to other users, and sets out Ofcom's conclusions on the engineering effects of increasing the power levels in UK Broadband's licence.

UK Broadband's request

5.2 UK Broadband's 3.5 GHz licence authorises it to establish, install and use radio transmitting and receiving stations and/or radio apparatus as described in the licence schedule (the 'Radio Equipment'). The schedule describes the Radio Equipment as Public Fixed Wireless Access transceivers including Access Point Transceivers (known as Hub Stations, Central Stations and Base Stations), Customer Premises Equipment (known also as Terminal Stations) and Radio Relay Repeaters forming part of the network. Such equipment is for transmission between fixed points, i.e. for fixed applications.

5.3 The licence does not impose any limitation on the technology that the Licensee may use.

5.4 Paragraph 7 of the licence schedule stipulates that the Licensee shall ensure that the Radio Equipment conforms to a maximum EIRP limit of +14 dBW/MHz. Paragraph 9 stipulates that the out of block emission from the Radio Equipment shall conform to the following:

Offset from edge of block	Maximum Permitted Radiated Level
0 to 3.5 MHz	- 43 dBW / MHz
Beyond 3.5 MHz	- 56 dBW / MHz

5.5 UK Broadband has asked for its licence to be amended in two ways:

- to allow technology and application neutrality; and
- to increase the allowed power levels to the EIRP limits specified by ECC/DEC/(07)02. The Annex to this Decision says that the guidance given in ECC Recommendation (04)05¹⁰ on technical conditions for implementation of flexible usage models shall be considered.

A copy of UK Broadband's variation request is at Annex 8.

5.6 As explained in paragraph 5.3, in fact the licence does not impose a limitation on what technology the Licensee may use, and so it does not require amendment to make it technology neutral. UK Broadband currently uses a broadband wireless product based on the 3rd Generation standard TD-CDMA developed by the global

¹⁰<http://www.ero.dk/documentation/docs/doc98/official/Word/REC0405.DOC>

Third Generation Partnership Project. This has been a matter of choice for UK Broadband and not dictated by the conditions in its licence. Its wish to switch to WiMAX technology would not be constrained by its licence.

- 5.7 UK Broadband's licence would need amendment to make it application neutral. A suitable amendment would mean that the licensee would not be restricted to providing fixed applications only. In order to effect this amendment the Radio Equipment described in the schedule would need to encompass any radio transmitting and receiving stations and/or any radio apparatus.
- 5.8 The requested amendment to increase the power limits in the licence would affect both the maximum permitted EIRP and the permissible out of block emissions. The amended Licence would stipulate that the licensee would have to ensure that the Radio Equipment conformed to a maximum EIRP limit as follows:

Maximum EIRP Limits

Station Type	Max EIRP spectral density (dBW/MHz) (Including tolerances and ATPC range, Note 1)
Central Station (CS) (and Repeater Station(RS) down-links)	+29
Terminal Station (TS) outdoor (and RS up-links)	+20
TS (indoor)	+12
Mobile	-5
Note 1: the total power delivered by a transmitter to the antenna of a station should not exceed 13 dBW, ITU RR S21.5 refers	

- 5.9 The maximum EIRP shown above is higher than the +23 dBW/MHz for central stations noted in Annex 2 of the ECC/REC 04-05. However, Ofcom considers that this higher level would be appropriate in order to facilitate the deployment of adaptive antennas, which is allowed for in note 2 of the Annex.
- 5.10 Also, the amended licence would stipulate that the out of block emission from the Radio Equipment should conform to the following:

Out of Block Emissions

Station Type	Max EIRP spectral density (dBW/MHz) (Including tolerances and ATPC range, Note 1)
Central Station (CS) (and Repeater Station(RS) down-	See Table 1 below

links)	
Terminal Station (TS) outdoor (and RS up-links)	Compliance with limits within ETSI Harmonised Standard EN 302 326-2
TS (indoor)	Compliance with limits within ETSI Harmonised Standard EN 302 326-2
Mobile	Compliance with limits within ETSI Harmonised Standard EN 302 326-2 ¹¹
Note 1: the total power delivered by a transmitter to the antenna of a station should not exceed 13 dBW, ITU RR S21.5 refers	

Table 1

Frequency offset	CS Transmitter Output Power Density Limits for out-of-block (dBW/MHz)
Block Edge when moving out of block	-36
+4 MHz of block edge	-77
+7.0 MHz of block edge	-89
Linear Interpolation Between Point	

Engineering effects for UK Broadband of the requested licence amendments

5.11 The licence variations that UK Broadband has requested would allow it to operate in a number of ways that are currently prevented by the conditions in its licence:

- The variation of the description of authorised radio equipment would mean that UK Broadband would not be limited to providing connections to fixed locations, and in particular to customer premises. It could provide connections to portable or mobile user terminals, as well as to fixed locations, anywhere within the UK.
- The increased in-band EIRP limit would enable UK Broadband base stations to serve portable or mobile terminals. In the absence of the higher permitted power mobile and portable terminal equipment would not perform as well as traditional FWA terminal equipment; the receivers are less sensitive and the antennas have a lower performance. A higher power is needed to deliver an acceptable level of service.
- The increased power limit would also reduce the number of base stations required to serve a given number of customers within a given coverage area.

¹¹ It is acknowledged that EN 302 326-1,2,3 is for “Fixed Radio Systems; Multipoint Equipment & Antennas”. In the absence of a directly applicable technical standard for mobile terminals the requested use of an emission mask drawn from the same technical standard would be appropriate.

Engineering effects for others

- 5.12 Ofcom has said that it would not normally expect to grant a request to vary a licence if the change would reduce the estimated spectrum quality of neighbouring assignments below the spectrum quality benchmark based on current spectrum planning assumptions. Ofcom has considered whether the variations to UK Broadband's licence described above would result in the unacceptable reduction in the quality of spectrum use enjoyed by other authorised spectrum users.
- 5.13 The users who may be affected by the variation are those who are spectrally adjacent to the spectrum licensed to UK Broadband, i.e. Programme Making and Special Events (PMSE) users. PMSE is assigned spectrum in the frequency range 3500-3580 MHz, which falls between the two spectrum blocks assigned to UK Broadband: there are no guard bands between these two users.

EIRP

- 5.14 The considerations that lay behind setting the in-block EIRP at +14 dBW/MHz in the licences awarded in the 2003 auction no longer apply. The considerations assumed an environment with a number of different regional operators. This is no longer the situation as UK Broadband's licence covers all the relevant regions. The power level requested is broadly in line with the limits that apply internationally to the base stations of mobile networks. In the light of these points Ofcom considers that it would be appropriate to increase to +29 dBW/MHz the maximum in-block EIRP in UK Broadband's licence.
- 5.15 If UK Broadband's licence were varied to allow the Licensee to establish, install and use any radio transmitting and receiving stations and/or any radio apparatus, user terminals would not have to be at fixed locations only; user terminals could be portable or mobile. Such terminals would not be physically capable of delivering the 14 dBW/MHz EIRP figure for which UK Broadband is currently licensed, or of course the higher figure that it has requested. ECC/DEC(07)02 gives indicative EIRP limits for mobile stations that are 19 dB lower than the limit in UK Broadband's licence.
- 5.16 Ofcom considers that if UK Broadband's licence is varied it should stipulate two EIRP limits: +29 dBW/MHz would be permitted for all stations except for mobile terminals; the EIRP level for mobile terminals would reflect the figure in ECC/DEC(07)02 of -5 dBW/MHz (+25 dBm/MHz).
- 5.17 Ofcom has considered whether increasing the maximum permitted EIRP could result in an unacceptable level of receiver blocking¹² cases between users in adjacent spectrum. There are numerous factors that may contribute to the incidence of blocking. The power level of the equipment being used is just one of these factors and it is not necessarily the most significant. Other factors include an increase of deployments by users within a spectrum block and the likelihood of deployments being sited in close proximity. Ofcom considers that these are dependant on the activities of both the potential source of blocking and the potential affected party. Such factors are outside the scope of current licence conditions and largely unpredictable. Blocking could, in fact, occur within the current limits of UK Broadband's licence. In considering whether there is likely to be an increased chance of blocking occurring Ofcom has taken account of the probability that the lower EIRP level for mobile terminals will offset the effects of the higher base station EIRP – the

¹² Receiver blocking is the inability to receive a wanted signal on a receiver's assigned frequency in the presence of an unwanted interferer on a frequency other than that being received.

aggregate position, broadly speaking, is likely to be unchanged. Ofcom considers, therefore, that varying the in-band EIRP limits as described above in paragraph 5.16 would not create extra blocking effects for users in adjacent spectrum.

Block edge mask

- 5.18 WiMAX technology is currently seen as one of those most likely to be used for the delivery of wireless broadband services in the 3.5 GHz band and Ofcom considers that the benefits to be derived from the variation of UK Broadband's licence, which are examined in the next section of this document, will be increased if UK Broadband is able to use this technology to its full advantage - and any other technology that it may regard as being technically and commercially feasible. WiMAX profiles have been published; they include vendor interoperability standards that are drawn from the IEEE 802.16e technical standards¹³. In contrast, the position on the 3.5 GHz emission mask for WiMAX equipment is uncertain. There is currently no internationally agreed position on the emission mask that should apply to 3.5 GHz WiMAX equipment and agreement may not be reached for another year or so. When a 3.5 GHz mask is agreed it is possible that it may not be entirely consistent with ECC/REC 04-05 or ECC/DEC(07)02.
- 5.19 Another source of uncertainty arises from the fact that the 3.5 GHz band is currently subject to a European Commission Mandate concerning the technical conditions that would be applied to WAPECS¹⁴ systems. The purpose of this mandate is to contribute to putting into practice the concept of flexibility as advocated in the Opinion of the RSPG on Wireless Access Policy for Electronic Communications Services (WAPECS), by developing least restrictive technical conditions which are sufficient to avoid harmful interference in the frequency bands that have been tentatively identified by the RSC for the implementation of the WAPECS approach. The technical conditions specific to each frequency band expected in response to this mandate will be considered for the introduction of harmonised technical conditions within the Community in order to achieve internal market objectives and facilitate cross border co-ordination. Work on the mandate has not been completed. The outcome may in time change the technical regulatory environment for the 3.5 GHz band.
- 5.20 Ofcom considers that given this level of uncertainty it would be preferable at present not to amend the block edge mask in UK Broadband's licence. If the WiMAX emission mask eventually agreed is inconsistent with the current licence limits it would be open to UK Broadband to request a licence variation at the appropriate time. Ofcom would consider such a request in accordance with its statutory duties and other legal requirements. UK Broadband agrees with this and has told Ofcom that it does not wish Ofcom at present to vary the out of block emission limits in its licence.

¹³ <http://www.ieee802.org/16/>

¹⁴ WAPECS stands for Wireless Access Platforms for Electronic Communications Services. For the EC mandate see - Mandate to CEPT to develop least restrictive technical conditions for frequency bands addressed in the context of WAPECS
http://ec.europa.eu/information_society/policy/radio_spectrum/docs/current/mandates/ec_to_cept_wapecs_06_06.pdf

Conclusions on the engineering effects of increasing the power levels in UK Broadband's licence

5.21 In summary Ofcom considers that:

- the +29 dBW/MHz requested is appropriate for the in-block EIRP for all stations (except for mobile terminals),
- permitting mobile terminals will not lead to any adverse effects on other spectrum users, and
- mobile terminals should have a maximum EIRP figure of -5 dBW/MHz.

Ofcom considers that these changes to the power limits in UK Broadband's licence would not reduce the estimated spectrum quality of other authorised spectrum users.

5.22 Ofcom considers that it is not appropriate at this time to consider varying the out of block emission limits in UK Broadband's licence because of the current uncertainty regarding equipment standards and the impact of ongoing work within CEPT on the WAPECS Mandate could have on the technical regulatory environment for the 3.5 GHz band.

5.23 The proposed changes to the licence schedule are shown in the copy of UK Broadband's licence at Annex 7.

Section 6

Assessment of UK Broadband's request for a licence variation

6.1 This section sets out Ofcom's assessment, in the light of its statutory and other legal duties, of granting UK Broadband's request for a licence variation by removing the limitation to fixed applications and increasing the power limit for all stations except mobile terminals. Ofcom has examined in particular the effects on consumers' interests, the optimal use of the spectrum, competition related issues, the requirement to ensure that licence conditions are objectively justified and other legal considerations. It also examines the timing of the variation. Ofcom's conclusion is that there appears to be no reason for it to refuse a variation of UK Broadband's licence that would remove the limitation to fixed applications and increase the maximum in-block power level. It considers that the variation should be made as soon as practicable, subject to the outcome of this consultation.

Potential benefits for consumers and the UK economy

6.2 Broadband is becoming an integral part of the UK communications landscape, a source of everyday communication, information and entertainment in many homes and central to the strategic plans of many communications service providers. This was a key finding in Ofcom's Digital Progress Report published in April 2007, which provides a comprehensive overview of recent trends in the broadband industry and consumer use of broadband¹⁵. Market research undertaken on Ofcom's behalf for the Digital Dividend Review¹⁶ indicated that consumers thought that mobile broadband access would benefit themselves and businesses. Mobile broadband was perceived as potentially having additional value to society, because of the range of opportunities it offers compared to other services tested and the value it might have to businesses. Breadth of service coverage was considered to be the most important feature of a mobile broadband service's additional value to society, as social inclusion was seen as a key feature of a service that had additional value to society. Potential consumer demand for accessing broadband on the move has been demonstrated by recent research by Point Topic Ltd¹⁷ that showed there was a high level of interest in mobile internet applications. When it asked what users would like to be able to do on the move it found that almost 60% of those interviewed would like to be able to email on the move, more than 45% wanted to be able to browse and search the internet, over 30% would like do their banking while mobile. This suggests that there is a considerable gap between what people are actually doing with their mobiles and what they would like to do. Point Topic suggested there were a number of reasons why there should be this gap, including dissatisfaction with current interface devices and uncertainty over the availability of these services. The new broadband services that UK Broadband would be able to introduce should the variation be made are designed to address this demand and some of the barriers to take up that users currently perceive.

6.3 UK Broadband's introduction of new broadband services could create benefits for consumers. Early development of UK Broadband's new broadband services should

¹⁵ http://www.ofcom.org.uk/research/cm/broadband_rpt/

¹⁶ <http://www.ofcom.org.uk/consult/condocs/ddr/mktresearch/>

¹⁷ <http://point-topic.com/>

take place in a period over which consumers will have access to similar services from only a limited number of other spectrum operators. Over this period UK Broadband would be enabled to bring to the market innovative services, which could enhance consumer welfare by creating the conditions for an enriched and more innovative range of products to be made available in the market earlier than otherwise. If these new services are seen as substitutes of existing services by consumers, there would still be benefits from innovation in technology and services arising from the granting of the licence variation. However, the benefits from UK Broadband's new services may arise mainly from the additional competition exerted on the comparable offer from other broadband providers.

- 6.4 Europe Economics has prepared for UK Broadband an assessment of the estimated benefits that the launch of the new services could bring in terms of consumer benefits for subscribers to the services (and also estimated beneficial impacts on the economy from turnover and linkages to other sectors). Ofcom has analysed these consumer benefit estimates and, while it agrees that benefits for consumers can reasonably be expected, it considers that these are likely to be overstated in the report, primarily due to very high take-up forecasts.
- 6.5 Ofcom considers that there is insufficient evidence pointing to exceptionally strong developments of wireless broadband (as shown in the application) taking into account recent and projected developments of wired broadband used by Ofcom. A more conservative forecast of wireless broadband take-up would be reflected in lower benefits to subscribers than predicted by UK Broadband.
- 6.6 Ofcom also considers that the assessment of benefits should concentrate on the net *incremental* benefits of granting the licence variation and that these are not the benefits measured in the Europe Economics report. The estimates of consumer benefits from subscriptions to the proposed new UK Broadband services shown in the report should be set against similar benefits to the consumer and the economy that could be generated by other market players if UK Broadband were not granted the request. In other words, one should compare the benefits that the licence variation could confer with the likely developments in the relevant markets without the licence variation.
- 6.7 Europe Economics has quantified benefits generated by the licence variation over a ten year period. Ofcom considers that, in addition to the current provision of access to mobile and nomadic broadband services, within a few years it is likely that other operators will be able to launch similar deployments to those planned by UK Broadband, possibly using the spectrum to become available in the 2.6 GHz frequency bands. Therefore, the net incremental consumer benefits from the subscription to UK Broadband new services which are related to the licence variation are likely to be material only in the early years of the development of UK Broadband's new broadband services.
- 6.8 Ofcom has estimated from UK Broadband's submission and Europe Economics's figures that about ten per cent of these consumer benefits are accounted for by the first three years of UK Broadband's presence in the mobile broadband market. Ofcom considers that these benefits may provide a better approximation of net incremental benefits of this kind, given that they would materialise at a time when there will be a less developed competing offer in the same segment from other players.
- 6.9 Nonetheless, Ofcom considers that granting a licence variation as soon as practicable in 2007 will maximise the potential for benefits linked to UK Broadband's

position in bringing innovative services to the market. The launch of UK Broadband's new broadband services is likely to increase consumer awareness of mobile and nomadic broadband services and foster an improved understanding of the applications of recently developed technologies. This increased awareness and understanding at an early stage is likely to create the conditions for a further increase in consumer take-up of these services, including services by other operators entering the market. The new UK Broadband services could therefore have an important role in limiting delays in the development and innovation of wireless broadband services in the UK. This is consistent with the views Ofcom has expressed in recent consultation documents regarding the use of 470-862MHz¹⁸ and 2.6 GHz¹⁹.

- 6.10 For these reasons, Ofcom has concluded that the licence variation would facilitate the creation of benefits to consumers.

Optimal use of spectrum

- 6.11 UK Broadband's licence is technology neutral and so it is not prevented from adopting new technologies, so long as these are operated within the technical restrictions in the licence. In order to exploit the advantages of emerging technologies, in particular the mobile functionality within the WiMAX technologies that it wishes to use, UK Broadband needs higher transmit powers to achieve the coverage it requires.
- 6.12 UK Broadband is currently restricted to operating public fixed wireless access equipment, as described in its licence, which includes end user terminals located at customer premises. It launched its broadband internet access service in the Thames Valley in 2004 and has expanded into parts of London. Whatever the success of this service and the future expansion of UK Broadband's coverage area, the use that UK Broadband may make of the spectrum licensed to it is inherently restricted by its licence conditions. If the restrictions were varied UK Broadband could continue to provide its current service to end user premises but it would also be able to provide services to nomadic and mobile users. The provision of these new services, on top of UK Broadband's current offering, will lead to a more intensive use of the spectrum.
- 6.13 The licence variation would allow UK Broadband to respond dynamically to changing circumstances and offer other new services without being restricted to offering a fixed service to customer premises. The services that UK Broadband is planning to introduce, if its licence is varied, are portable, high-speed broadband, primarily data, services to handheld devices and laptops. Its immediate plans include providing nomadic services via a public access WiFi network and installing semi-private base stations in client premises, which will allow access both to the client's staff and to UK Broadband's public access service. In the longer term, varying UK Broadband's licence on the lines proposed would enable it to introduce new services as they became technically and commercially feasible. This freedom would allow UK Broadband to make optimal use of the spectrum in responding to new consumer demands.

¹⁸ See for example Ofcom's consultation document: "Digital Dividend Review" at paragraph 8.24 "Ofcom's starting position is that any delay in making available spectrum for new uses risks a loss of consumer benefits as a result of consequent delays to the availability of new services, or to reductions in prices from increased competition;".

¹⁹ Ofcom consultation on the "Award of available spectrum: 2500-2690 MHz, 2010-2025 MHz and 2290-2300 MHz," at paragraph 6.24.

Impact on competition

- 6.14 Ofcom considers that in general spectrum liberalisation should be highly beneficial to competition, by removing unnecessary constraints on the competitive process. UK Broadband's introduction of new broadband services would be likely to strengthen competition in the provision of such services. Making the licence variation could have a positive impact on competition through new entry in markets where UK Broadband does not currently operate. It could also lead to more competition in product quality and create a wider range of services in markets where UK Broadband already operates. In either case, the launch of new services or the increased number of market players generally would intensify the competitive process, which ultimately would be to the benefit of consumers.
- 6.15 However, Ofcom acknowledges that there might also be circumstances in which liberalisation could weaken competition. For this reason it has carried out an analysis of the dynamics of competition in downstream markets where UK Broadband may operate if the variation were granted, assessing the potential for beneficial or detrimental impacts²⁰ on competition from making the licence variation. This analysis is set out in more detail below, and it shows that such a variation is likely to boost competition and thereby benefit consumers. It also shows that the potential for a negative impact on the competitive process is very limited.
- 6.16 Since UK Broadband has requested a licence variation that will allow it to provide services to nomadic and mobile users, as well as to customer premises, it is feasible that there will be a number of downstream services where 3.5 GHz spectrum could be used as an input. Ofcom understands that UK Broadband will probably continue to operate in the provision of retail fixed wireless broadband access services, bringing a new range of services to this market, and also seek to enter markets where it is currently not operating, for example the provision of mobile or nomadic broadband access services of the kind described in its application.
- 6.17 As 3.5 GHz spectrum could be used to provide a number of downstream services, there is a broad range of potential economic markets which are relevant to this licence variation application. It is not therefore possible to define the precise boundaries of the relevant markets as that would rely on speculation about how broadband markets will develop. However, Ofcom considers that it is prudent to undertake analysis by reference to a number of candidate markets which are likely to be relevant. In undertaking that exercise, it does not appear necessary for Ofcom to come to a firm view of the precise boundaries of all the relevant economic markets as Ofcom can assess the potential impacts on competition through the construct of a number of candidate markets.
- 6.18 Ofcom has identified a set of candidate markets for the assessment of possible competition impacts on the basis of the current activities of UK Broadband and information on the roll out of the company's planned new services. It has defined these alternative candidate markets as follows:
- Broadband access – a market which includes all broadband access, where UK Broadband's new broadband services would be in competition with wired broadband access and fixed wireless access and mobile broadband access;

²⁰ However, given that the benefits through which firm and product entry into markets benefit competition are well known, the analysis is undertaken particularly to assess the scope for the existence of mechanisms that may lead competition to weaken.

- Mobile wireless broadband access – a market which includes UK Broadband's new broadband services and fully mobile broadband access services, but excludes fixed broadband access services; and
- Nomadic wireless broadband access – a market which includes the portable use of terminals but excludes fully mobile broadband access.

6.19 Ofcom has formally defined wholesale broadband access markets in its 2006 consultation on the review of the wholesale broadband access markets.²¹ In that review Ofcom also considered aspects of the retail market, the relevant conclusions are considered in the following paragraph.

Broadband access

6.20 If broadband access were the relevant economic market, then the impact of making the licence variation could have a positive, though probably marginal, impact on competition. There is currently a wide range of retail service offerings from fixed broadband access service providers, including UK Broadband, and a growing mobile broadband market, with offers from the five 3G mobile operators. Ofcom has noted in its review of the wholesale broadband access markets 2006 consultation that wireless technology could offer a competitive constraint to cable and xDSL technologies in the longer term, but it is not likely to provide significant competitive constraints in the short run.²²

6.21 Ofcom considers that in the mobile segment within this market, the incumbent 3G mobile network operators (MNOs) would be in a position to compete with the new entrant in particular relying on their pricing flexibility. Whether entry by UK Broadband following the removal of licence restrictions will occur in geographically targeted entry or not, the 3G MNOs will thus be able to respond to targeted entry also by changing their tariff structures.

6.22 Incumbents may enjoy a number of advantages over new entrants. Experience from the development of 2G networks world-wide has shown that extensive network coverage has been a pre-requisite for success in mobile markets. Other incumbency advantages may stem from having created a well established commercial identity and customer basis and having enjoyed from early mover advantages in establishing a presence in the market. A new entrant would have to undertake brand development to be in a position to attract customers and might initially incur higher costs as a result.

6.23 Another consideration will be relevant should UK Broadband choose to use 3G technology as well as other technologies on the 3.5 GHz spectrum. Ofcom research has shown that the cost of providing 3G services tends to increase with frequency. More base stations are required to provide the same levels of coverage, quality and capacity in both urban and rural areas because of the technical characteristics of UMTS technology. Incumbents with access to lower frequencies could have considerable cost advantages in this respect over a new entrant using UMTS.

²¹ Review of the wholesale broadband access markets 2006/07: Identification of relevant markets, assessment of market power and proposed remedies, available at <http://www.ofcom.org.uk/consult/condocs/wbamr/wbamr.pdf>

²² See "Review of the wholesale broadband access markets" published 21 November 2006, available at <http://www.ofcom.org.uk/consult/condocs/wbamr/wbamr.pdf>. Low take-up and availability of the technology underpinned this conclusion, see paragraph A2.6.

- 6.24 Ofcom considers that if it is viable for firms to enter, competition is unlikely to be weakened and may be enhanced given the limited number of firms in the mobile market. Under broad conditions, new entry would be likely to reduce prices and increase output - thus increasing economic welfare.
- 6.25 We note that Ofcom has expressed the view in the 2.6 GHz award consultation document²³ that licence conditions will not prevent the incumbents from responding competitively to targeted entry by new players using the 2.6GHz spectrum. Ofcom is now analysing the responses to this consultation and will take these responses into account in finalising, during the course of 2007, its decisions on the 2.6 GHz award.

Mobile wireless broadband access

- 6.26 The mobile wireless broadband access market is narrower than the broadband access market as it excludes fixed broadband access services. If this were the relevant market, the impact on competition could be significant, depending on the take up of UK Broadband's proposed new broadband services. If the licence variation is made, UK Broadband could be a new entrant into this market and could bring significant additional competition to providers of mobile wireless broadband access services, which would ultimately be to the benefit of consumers. Ofcom does not consider that entry would weaken the competitive process as the incumbent mobile network operators would be able to respond competitively to new entry.

Nomadic wireless broadband access

- 6.27 The nomadic wireless broadband access candidate market is limited to the provision of broadband access to stationary users at different locations. In a market defined as narrowly as this UK Broadband would not be the sole provider of services. There are a large and increasing number of WiFi hotspots that provide facilities for nomadic use. Also, other operators have access to spectrum that might be used to compete in the provision of nomadic wireless broadband services, and other spectrum (e.g. the 2.6 GHz band) is to be made available over coming years that could support the provision of these services. Therefore, Ofcom's view is that competition in this market is likely to be enhanced by UK Broadband's presence and that there is unlikely to be any detrimental impact.

Conclusions on the identification of affected markets and competition impacts

- 6.28 The question of the precise scope of the relevant economic market is an empirical one and can only be fully addressed once relevant services are being offered and consumers' and suppliers' behaviour observed. However, the high level analysis above shows that such a variation is likely to facilitate greater intensity in the competitive process, which ultimately would be to the benefit of consumers. Further, the potential for detrimental impacts on competition from making the licence variation are limited.
- 6.29 There is some uncertainty around the deployments and technologies UK Broadband might choose if the variation is made. Concerns about a weakening of competition following a licence variation seem unwarranted. Considering a possible range of communication markets Ofcom does not envisage a situation where existing market players would be prevented from competing with UK Broadband and where the entry of a new service provider could lead to weaker competition and diminished consumer

²³ "Award of available spectrum: 2500-2690 MHz, 2010-2025 MHz and 2290-2300 MHz : Consultation," December 2006. See in particular page 176 of the consultation document.

benefits. On the contrary, Ofcom considers that making the licence variation would be beneficial and assist the promotion of competition.

Increased value of the licensed spectrum

- 6.30 Comments were made by respondents to the SFR:IP consultation to the effect that the liberalisation of UK Broadband's licence should not be allowed to distort competition by giving the company a windfall benefit. Failure to impose a licence fee to reflect the increased value of the licence would constitute a state aid if the effect of the failure was to confer an advantage on the licensee over other licensees in a similar position.
- 6.31 In general, the effect of spectrum liberalisation could be either to increase or to decrease the value of spectrum licences because there are effects in different directions. On the one hand, liberalisation increases flexibility for the licensee and enables the spectrum to be a more fungible input. On the other hand, liberalisation in general reduces barriers to entry and so tends to increase competitive pressure. Even if there were an increased value of the licence (which T-Mobile and Orange refer to as a windfall benefit), there would not necessarily be a distortion of competition, as this would depend on the detailed nature of the impact and the circumstances. For example, less direct effects on pricing strategies and competition can be expected if the impact is a change in fixed costs and in some circumstances there might be no effect. For the reasons set out above, Ofcom's view is that the potential for detrimental impacts on competition from making the licence variation is limited.
- 6.32 It could be argued that in order for Ofcom to fulfil its duty to secure optimal use of spectrum an additional licence fee should be charged to UK Broadband to reflect an increased value of the spectrum arising from the changes. Failure to do so would risk UK Broadband utilising the spectrum in a sub-optimal manner.
- 6.33 Where spectrum is allocated through an administrative process Ofcom often charges an additional licence fee to incentivise the licence holder to utilise the spectrum in an optimal manner. This charging of additional licence fees is known as Administered Incentive Pricing (AIP). It involves levying an annual fee on the licence holder to affect the ongoing cost of having the right to use the spectrum. The principles for applying AIP suggest that it should be set to reflect the full opportunity cost - i.e. taking into account the marginal value of the spectrum in other uses as well in the current use (as embodied in the current charges).²⁴
- 6.34 The UK Broadband licence is already tradable and liberalised, inter alia, to the extent that it is technology neutral. The variations considered in this document would liberalise the licence further. These conditions should promote efficient use of the spectrum and suggest that the imposition of AIP, as an additional step, is unnecessary.
- 6.35 AIP has not been used for spectrum that has been allocated through an auction. Auctions are deemed to generate an efficient allocation of spectrum at the time of the award. Allocations made by auction are likely to remain efficient if the spectrum is tradable in the secondary market and if spectrum is liberalised, as trading and liberalisation enhance the potential for spectrum to change control and/or use to its most efficient form.

²⁴ Ofcom's Statement on Spectrum Pricing, February 2005

- 6.36 Moreover, Ofcom considers that if UK Broadband's licence is varied to increase the flexibility of use there are clear indicators that this should promote optimal use of the spectrum:
- UK Broadband is planning to introduce new uses and applications for 3.5 GHz spectrum; in particular the request for changes to power limits has been justified (in the application) by the need to enable effective mobile WiMAX communications on these frequencies to create the potential for new deployments and consumer services.
 - The information contained in UK Broadband's application suggests that UK Broadband is facing the incentives to make optimal use of the spectrum and planning to innovate and expand the range of services offered to consumers if the licence variation is made.
- 6.37 Furthermore, even if UK Broadband decided not to use the spectrum for alternative uses, it would face an incentive to trade the rights conferred by the licence with other users who could make a more efficient use of spectrum and therefore show a higher valuation of the 3.5GHz rights than the seller of these rights.
- 6.38 All of these considerations suggest that it is unnecessary to introduce an additional licence fee to secure the efficient use of the spectrum.
- 6.39 In addition, Ofcom also considers that the case for additional licence fees should be assessed against potential regulatory failure risks associated with charging a positive licence fee.
- The potential for variation of the licence was known at the time of the auction and is likely therefore to have been reflected (alongside other aspects of the regulatory environment) in the price paid. If the auction led to an efficient allocation of rights that reflected the full potential of the licence, the full opportunity costs should already be reflected in the price paid for the licence. Therefore charging an additional licence fee would risk distorting efficiency.
 - Introducing a licence fee now, as a response to the request for spectrum liberalisation, could create perverse incentives in a dynamic setting. In other words, it could act as a deterrent to investments in innovation and new applications (eventually leading to an appreciation of spectrum rights) on the licensed spectrum by incumbents in other spectrum bands, since, other things being equal additional licence fees would lower the returns from such investments.
 - In setting the licence fee, if the determined value were too high it might impair effective trade, creating inefficiencies.
- 6.40 Ofcom considers that there do not appear to be a distortion to competition or concerns regarding the existence of potentially inefficient uses of spectrum to justify introducing an additional licence fee.
- 6.41 In Ofcom's analysis of the effects that the proposed variation of UK Broadband's licence it concluded that it would be beneficial and assist the promotion of competition. This is relevant to the question of state aid since, in the first instance, a state aid can only arise where there is a distortion of competition. Further, Ofcom is acting in a manner consistent with what is required by the legal duty not to preserve wireless telegraphy licence conditions that cease to be objectively justifiable or

proportionate. That duty is set out in the Wireless Telegraphy Act 2006 but derives from the obligation on Member States contained in the EU Authorisation Directive 2202/20/EC. Ofcom is of the view that the exercise of that duty (which is conferred by EU law) cannot, in any event, constitute a breach of EU state aid rules.²⁵

Discrimination

- 6.42 It was suggested in response to the SFR: IP that liberalising UK Broadband's licence would be discriminatory, because, while being allowed mobile use UK Broadband would not be subject to the rollout obligation in 3G licences or to the restrictions on use in 2G licences.
- 6.43 Ofcom considers that undue discrimination can only arise where different treatment is given to persons in similar circumstances, or where the same treatment is given to persons in different circumstances, and there is lack of objective justification for the treatment given. In this case, while Ofcom recognises that there are differences between the conditions in UK Broadband's licence and those in 2G and 3G licences the circumstances of the respective licensees are different. The main differences are:
- 2G and 3G licences were awarded a number of years earlier than UK Broadband's Licence and this has allowed the licensees to develop extensive networks. In contrast UK Broadband, if it is allowed to provide mobile services, will need to build a network from what is at present a very limited geographical and customer base. In other words, the mobile network operators (MNOs) have clear early mover advantages.
 - The MNOs and UK Broadband operate in different frequency bands which make them more suitable for different applications, technologies and deployment strategies. The 2G and 3G bands are recognised as prime mobile bands. On the other hand, the 3.5 GHz band was until recent years seen primarily as one suitable for fixed services. It is only the technology developments since the 2003 auction that has seen the band transformed to one that can support nomadic and mobile applications. Equipment being developed for the band has had to be designed to overcome the unfavourable propagation characteristics of the band for mobile communications relative to those of the established mobile cellular bands.
 - Spectrum in the 3.5 GHz band licensed to UK Broadband is not subject to international harmonisation measures, in the same way as spectrum used for 2G and 3G services. There has therefore been no requirement on UK regulators to impose restrictions on the technology that UK Broadband may use.
 - UK Broadband currently provides different services from 2G and 3G operators and may continue to do so even if the licence variation is made. It has said, for example, that it will continue to deliver fixed services to customer premises as well as introducing nomadic services. These services are of a different character from those provided by MNOs.
 - UK Broadband's licence is limited to a maximum 15 year term, whereas the 2G licences are open ended and 3G licences have a 20 year term. MOD's agreement to use of the 2x20 MHz of spectrum within the 3.5 GHz band that it

²⁵ Ofcom's view is supported by the approach taken by the EC Commission in case: "NN 42/2004 – France - Modification rétroactive des redevances dues par Orange et SFR au titre des licences UMTS", dated 20 June 2004

licensed to UK Broadband was for a period of 15 years from the commencement of licences

- 6.44 Ofcom therefore considers that because of these different circumstances there is no undue discrimination in the existence of different licence conditions between UK Broadband and 2G and 3G licensees.
- 6.45 Notwithstanding this conclusion, Ofcom has considered the suggestion that the existence of the rollout obligation in 3G licences and the restrictions on use in 2G licences would discriminate unfairly against MNOs should UK Broadband be allowed to offer mobile services.
- 6.46 On rollout obligations, it is noteworthy that this obligation on 3G licensees must be met at the end of 2007, and Ofcom expects that most, if not all, of the licensees will have fulfilled the obligation. It is difficult to see how it would be justifiable to impose a similar restriction on UK Broadband at this time. In addition, it is not clear what objectives would be achieved by the imposition of such an obligation on UK Broadband. The Authorisation Directive demands that licence conditions are objectively justified in relation to the network or service concerned, non-discriminatory, proportionate and transparent.
- 6.47 The 2G licences currently allow only GSM services to be delivered. Ofcom is planning to consult on the liberalisation of 2G licences in forthcoming months. It will consider the question against its statutory duties, including the duty to ensure that wireless telegraphy licence conditions are objectively justified, non-discriminatory, proportionate and transparent.

Timing of the licence variation

- 6.48 Ofcom has considered whether the variation of UK Broadband's licence should take effect as soon as practicable or whether it should be delayed. An important factor here is when the benefits arising from the licence variation are likely to occur. Ofcom has also noted that some responses to the SFR:IP suggested that the UK Broadband licence should not be varied before 2G licences had been liberalised or before further 3G spectrum had been released.
- 6.49 In the early years following the proposed variation of UK Broadband's licence, there would be benefits linked to UK Broadband's position in bringing innovative services to the market. The launch of UK Broadband's new broadband services would be likely to generate consumer awareness of mobile and nomadic broadband services and an improved understanding of the applications of recently developed technologies. This increased awareness and understanding at an early stage is likely to create the conditions for a further increase in consumer take-up of these services.
- 6.50 Ofcom considers that delaying the variation of UK Broadband's licence could jeopardise the early realisation of the benefits arising from the development and innovation of wireless broadband services in the UK. This is consistent with the views Ofcom has expressed in recent consultation documents regarding the use of 470-862MHz²⁶ and 2.6 GHz.²⁷ In this case, delaying the launch of these services and

²⁶ See for example Ofcom's consultation document: "Digital Dividend Review" at paragraph 8.24 "Ofcom's starting position is that any delay in making available spectrum for new uses risks a loss of consumer benefits as a result of consequent delays to the availability of new services, or to reductions in prices from increased competition;".

²⁷ Ofcom consultation on the "Award of available spectrum: 2500-2690 MHz, 2010-2025 MHz and 2290-2300 MHz," at paragraph 6.24.

take up of broadband, even if only by one or two years and under conservative assumptions on take-up, could create a significant loss in benefits to consumers and contribution to the economy.

- 6.51 Ofcom considers that given the intention of UK Broadband to provide innovative services that rely on mobile WiMAX, delaying the licence variation could prevent most of the incremental beneficial impacts to consumers from the licence variation. Such a delay would be likely to result in the reduced provision of mobile broadband services in the UK over the next 2-3 years. This could in turn lead to further delays and lower take-up of similar deployments that rely on different spectrum frequencies and could be launched from 2010/2011 (including similar uses relying on 2.6 GHz spectrum).
- 6.52 Ofcom does not consider that points made in responses to the SFR:IP would justify delaying the variation beyond 2007. Circumstances have changed significantly since the SFR:IP was published in January 2005. As mentioned above, Ofcom is planning to consult on the liberalisation of the 2G licences in forthcoming months. It is also planning early in 2008 to award licences in the 2.6 GHz band, which is appropriate for a wide range of technologies including UMTS. Both of these developments are relevant to the points made in the responses.

Objective justification for licence conditions

- 6.53 Ofcom has examined the reasons why UK Broadband's licence was granted on the current terms and assesses whether these reasons are still valid now four years on when viewed against the rapid and significant technological developments which have taken place since the 2003 auction.
- 6.54 As mentioned in Section 4, Ofcom has a statutory duty (in section 9(7) of the Wireless Telegraphy Act 2006) to ensure that 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 the state of technology development at the time and market circumstances.
- 6.55 In the period leading up to the 2003 auction regulators' and industry's expectations were reflected in the licence condition that limited use to PFWA transceivers. The auction made the spectrum available in a way that was consistent with ERC Recommendation 13-04, which identified a number of preferred frequency bands for Fixed Wireless Access (FWA) in Europe, including 3.4-3.6 GHz. The auction followed an extensive period of consultation by RA and the successive consultations presumed that the spectrum would be used for the provision of FWA services to end-user premises. Expectations about how the band might be used have changed and so has the regulatory environment. Ofcom has taken over from RA the function of granting wireless telegraphy licences. Ofcom's approach to spectrum management, as set out in the documents referred to in paragraph 2.3 above, favours an application and technology neutral model, which is also one that European regulators are increasingly adopting (including the European Commission). Under this approach the spectrum user has greater freedom to select the particular use for its spectrum.
- 6.56 Technology has been developing since the 2003 auction. At that time it was generally accepted in the industry and by RA that the best use of the spectrum was Fixed Wireless Access (FWA). The FWA concept was seen to be particularly useful for the use of radio technology to provide 'last mile' connection between user premises and the fixed telecommunications network. Connections were primarily seen as being

made via external mounted antennas. For that reason the licence was granted with permitted transmission power levels that were suitable for FWA networks. The most notable development for the 3.5 GHz band has seen its transformation from a band seen primarily as one suitable for fixed services to one that can support nomadic and mobile applications. A number of different technologies have been developed since 2003 for use in the band. These technologies are more focused towards that nomadic and mobile model. Developments have been further accelerated by industry groups working towards interoperability of systems which in turn has accelerated the improvement and attractiveness of systems. There are a number of large silicon chip manufacturers who have developed WiMAX chipsets and there are also major equipment manufacturers producing both infrastructure and handheld terminal devices that will operate in the 3.5 GHz band. UK Broadband has stated that it expects handheld devices to be available from mid summer 2007.

- 6.57 The broadband market also has changed significantly since the 2003 auction, particularly in terms of access to and take-up of broadband.²⁸ The 3.5 GHz auction information memorandum stated that, in 2002, broadband connections were provided principally via ADSL and cable modem. Broadband's share of the overall Internet access market was still relatively low: in November 2002, BT reported 1,120 exchanges enabled, giving 63% coverage; in addition, the Telewest and NTL franchise footprints enabled cable modem services to 43% of UK homes. By January 2006, in contrast, BT data showed that 99.9% of UK premises were connected to broadband enabled exchanges, cable penetration remained stable at 45% of UK homes. The take up of broadband has also increased over the period, e.g. in 2003 11% of all adults lived in a home with a broadband connection and this rose to 50% in 2006. As described in paragraph 6.2 demand for nomadic and mobile access to broadband is also emerging.

Expectations at the time of the auction

- 6.58 Ofcom has considered the expectations that existed in respect of participants in the 2003 auction (and those who had considered participating).
- 6.59 It may be argued that the bidding behaviour of participants in the 2003 auction was, in part at least, influenced by the services that they would be able to offer using the spectrum to be awarded and that they relied on statements that RA made on this matter. It is also arguable that others with an interest in the spectrum were similarly influenced in their decisions not to participate.
- 6.60 Ofcom has considered various aspects of this question, including the nature of statements that RA made prior to the auction, to what extent the possibility of variation might have been foreseen and whether it would be in the public interest to override any legitimate expectation that might exist.
- 6.61 Prior to the auction RA responded to a question whether the spectrum to be awarded could be used for the provision of mobile services to persons travelling on public transport. RA said that the spectrum was allocated on a primary basis to fixed services for fixed wireless access and that the provision of such a service would not be permitted. However, RA made no statement or undertaking that the restriction could not be varied. On the contrary, the licence clearly stated that, subject to

²⁸ For a comprehensive overview of UK broadband trends see http://www.ofcom.org.uk/research/cm/broadband_rpt/broadband_rpt.pdf

procedure set out in the WT Act, it could be varied, among other circumstances, at the request of the Licensee.

- 6.62 The 2003 auction was held before the introduction of but against the background of what was termed in the IM as ‘a complete overhaul of the UK regulatory regime applicable to communications ... proposed by the Communications Bill’. The IM contained information on these proposals. It also referred to the independent review of spectrum management (the ‘Cave review’), which contained numerous recommendations to Government on how the spectrum management framework should be changed to keep pace with technology and market developments. One of the review’s recommendations, which the Government had formally accepted in October 2002, was that RA should aim to minimise the licence conditions necessary for efficient spectrum use. This foreshadowed Ofcom’s introduction of spectrum liberalisation. Given these prospective changes in the regulatory environment Ofcom considers that it is possible that those interested in participating in the auction might have been able to conclude that the basis on which the auction was likely to change and in particular that the removal of restrictions from the licences being awarded was a possibility.
- 6.63 Ofcom has carefully reviewed what was said and done at the time of the auction. In summary Ofcom considers that no statements or representations were given at the time of the auction or since which would give rise to a ‘legitimate expectation’ in law that the licence conditions would not be changed during the term of the licence, such that Ofcom would now be prevented on the basis of the principle of legal certainty from changing them.
- 6.64 Further, Ofcom considers that events at the time of the auction should (in any case) in principle not be used to prevent the realisation of benefits that would follow from the proposed licence variation. Spectrum licensees are not entitled to expect that spectrum management regulation and policy will remain static.
- 6.65 Ofcom considers that it has a legal duty (which was enacted after the auction took place – now contained in section 9(7) of the Wireless Telegraphy Act 2006), in summary, not to preserve wireless telegraphy licence conditions which cease to be objectively justifiable or proportionate unless there are compelling reasons to do so, such as unfairness to others. Further, the ability to make changes to licence terms is set out in statute (paragraph 6 of Schedule 1 of the Wireless Telegraphy Act 2006). If the Secretary of State had intended to fetter his (and subsequently Ofcom’s) discretion to change the licence terms a restriction on the exercise of the power to vary the licence would have been written into the terms of the licence itself (in accordance with paragraph 8 of Schedule 1 of the 2006 Act). That was not done and so Ofcom believes it is therefore free to exercise that legal duty by exercising its licence variation functions.

International obligations

- 6.66 Ofcom must comply with 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. As explained in Section 3 above, there are no such obligations relating to the 3.5 GHz band.

Direction from the Secretary of State

6.67 Ofcom must comply with any direction from the Secretary of State under section 5 of the Communications Act 2003 and section 5 of the 2006 Act. No such direction has been made relating to UK Broadband's licence or the 3.5 GHz band.

Conclusions

6.68 Ofcom's initial view (which is the subject of this consultation process) is that:

- Technology has changed and developed since the 2003 auction and there is new equipment on the market that is capable of using UK Broadband's spectrum;
- UK Broadband wishes to deploy new technology to provide services that would benefit its customers;
- As discussed in section 5 there are unlikely to be any detrimental impacts on spectrum quality for others in neighbouring bands;
- There is therefore no spectrum management reason for maintaining the current level of restrictions in UK Broadband's licence.
- Ofcom has considered whether there might be any other policy reasons for continuing with the current restrictions. Ofcom can see no public policy reasons. On the contrary Ofcom's policy favours removal or reduction of licence restrictions where possible. Assessment of the proposed changes in the context of the matters to which Ofcom is required to have regard in law indicate that Ofcom should not continue with the current restrictions.

6.69 There appears to be no sound objective justification for continuing with the current restrictions that limit UK Broadband to fixed applications and that limit the maximum in-band power permitted to +14 dBW/MHz. In addition Ofcom has considered the effects of the proposed variation in the context of Ofcom's statutory duties and considers these to be positive.

Do you agree that the case for making changes requested by UK Broadband to its licence has been made? If not, why would it not be appropriate to vary UK Broadband's Wireless Telegraphy Public Fixed Wireless Access Operator Licence by (i) allowing application neutrality and (ii) increasing the permitted maximum in-band EIRP, and why would it not be appropriate to vary the licence as soon as practicable?

Section 7

Next steps

- 7.1 Ofcom will analyse all responses it receives by the closing date for this consultation of 21 August 2007 and in making its decision on UK Broadband's application for licence variation consider them against its statutory duties.

Annex 1

Responding to this consultation

How to respond

- A1.1 Ofcom invites written views and comments on the issues raised in this document, to be made **by 5pm on 27 August 2007**.
- A1.2 Ofcom strongly prefers to receive responses using the online web form at http://www.ofcom.org.uk/consult/condocs/bb_application/howtorespond/form, as this helps us to process the responses quickly and efficiently. We would also be grateful if you could assist us by completing a response cover sheet (see Annex 3), to indicate whether or not there are confidentiality issues. This response coversheet is incorporated into the online web form questionnaire.
- A1.3 For larger consultation responses - particularly those with supporting charts, tables or other data - please email Joe.sonke@ofcom.org.uk attaching your response in Microsoft Word format, together with a consultation response coversheet.
- A1.4 Responses may alternatively be posted or faxed to the address below, marked with the title of the consultation.
- Joe Sonke
3rd Floor
Riverside House
2A Southwark Bridge Road
London SE1 9HA
Tel: 020 7783 4345
Fax: 020 7783 4303
- A1.5 Note that we do not need a hard copy in addition to an electronic version. Ofcom will acknowledge receipt of responses if they are submitted using the online web form but not otherwise.
- A1.6 It would be helpful if your response could include direct answers to the question asked in this document, which is given in Annex 4. It would also help if you can explain why you hold your views and how Ofcom's proposals would impact on you.

Further information

- A1.7 If you want to discuss the issues and questions raised in this consultation, or need advice on the appropriate form of response, please contact Joe Sonke on 020 7783 4345.

Confidentiality

- A1.8 We believe it is important for everyone interested in an issue to see the views expressed by consultation respondents. We will therefore usually publish all responses on our website, www.ofcom.org.uk, ideally on receipt. If you think your response should be kept confidential, can you please specify what part or whether all of your response should be kept confidential, and specify why. Please also place such parts in a separate annex.

- A1.9 If someone asks us to keep part or all of a response confidential, we will treat this request seriously and will try to respect this. But sometimes we will need to publish all responses, including those that are marked as confidential, in order to meet legal obligations.
- A1.10 Please also note that copyright and all other intellectual property in responses will be assumed to be licensed to Ofcom to use. Ofcom's approach on intellectual property rights is explained further on its website at <http://www.ofcom.org.uk/about/accoun/disclaimer/>

Next steps

- A1.11 Following the end of the consultation period, Ofcom intends to publish a statement later in 2007.
- A1.12 Please note that you can register to receive free mail Updates alerting you to the publications of relevant Ofcom documents. For more details please see: http://www.ofcom.org.uk/static/subscribe/select_list.htm

Ofcom's consultation processes

- A1.13 Ofcom seeks to ensure that responding to a consultation is easy as possible. For more information please see our consultation principles in Annex 2.
- A1.14 If you have any comments or suggestions on how Ofcom conducts its consultations, please call our consultation helpdesk on 020 7981 3003 or e-mail us at consult@ofcom.org.uk . We would particularly welcome thoughts on how Ofcom could more effectively seek the views of those groups or individuals, such as small businesses or particular types of residential consumers, who are less likely to give their opinions through a formal consultation.
- A1.15 If you would like to discuss these issues or Ofcom's consultation processes more generally you can alternatively contact Vicki Nash, Director Scotland, who is Ofcom's consultation champion:

Vicki Nash
Ofcom
Sutherland House
149 St. Vincent Street
Glasgow G2 5NW

Tel: 0141 229 7401
Fax: 0141 229 7433

Email vicki.nash@ofcom.org.uk

Annex 2

Ofcom's consultation principles

A2.1 Ofcom has published the following seven principles that it will follow for each public written consultation:

Before the consultation

A2.2 Where possible, we will hold informal talks with people and organisations before announcing a big consultation to find out whether we are thinking in the right direction. If we do not have enough time to do this, we will hold an open meeting to explain our proposals shortly after announcing the consultation.

During the consultation

A2.3 We will be clear about who we are consulting, why, on what questions and for how long.

A2.4 We will make the consultation document as short and simple as possible with a summary of no more than two pages. We will try to make it as easy as possible to give us a written response. If the consultation is complicated, we may provide a shortened version for smaller organisations or individuals who would otherwise not be able to spare the time to share their views.

A2.5 We will normally allow ten weeks for responses to consultations on issues of general interest.

A2.6 There will be a person within Ofcom who will be in charge of making sure we follow our own guidelines and reach out to the largest number of people and organizations interested in the outcome of our decisions. This individual (who we call the consultation champion) will also be the main person to contact with views on the way we run our consultations.

A2.7 If we are not able to follow one of these principles, we will explain why. This may be because a particular issue is urgent. If we need to reduce the amount of time we have set aside for a consultation, we will let those concerned know beforehand that this is a 'red flag consultation' which needs their urgent attention.

After the consultation

A2.8 We will look at each response carefully and with an open mind. We will give reasons for our decisions and will give an account of how the views of those concerned helped shape those decisions.

Annex 3

Consultation response cover sheet

- A3.1 In the interests of transparency and good regulatory practice, we will publish all consultation responses in full on our website, www.ofcom.org.uk.
- A3.2 We have produced a coversheet for responses (see below) and would be very grateful if you could send one with your response (this is incorporated into the online web form if you respond in this way). This will speed up our processing of responses, and help to maintain confidentiality where appropriate.
- A3.3 The quality of consultation can be enhanced by publishing responses before the consultation period closes. In particular, this can help those individuals and organisations with limited resources or familiarity with the issues to respond in a more informed way. Therefore Ofcom would encourage respondents to complete their coversheet in a way that allows Ofcom to publish their responses upon receipt, rather than waiting until the consultation period has ended.
- A3.4 We strongly prefer to receive responses via the online web form which incorporates the coversheet. If you are responding via email, post or fax you can download an electronic copy of this coversheet in Word or RTF format from the 'Consultations' section of our website at <http://www.ofcom.org.uk/consult/244504/>.
- A3.5 Please put any parts of your response you consider should be kept confidential in a separate annex to your response and include your reasons why this part of your response should not be published. This can include information such as your personal background and experience. If you want your name, address, other contact details, or job title to remain confidential, please provide them in your cover sheet only, so that we don't have to edit your response.

Cover sheet for response to an Ofcom consultation

BASIC DETAILS

Consultation title:

To (Ofcom contact):

Name of respondent:

Representing (self or organisation/s):

Address (if not received by email):

CONFIDENTIALITY

Please tick below what part of your response you consider is confidential, giving your reasons why

Nothing	<input type="checkbox"/>	Name/contact details/job title	<input type="checkbox"/>
Whole response	<input type="checkbox"/>	Organisation	<input type="checkbox"/>
Part of the response	<input type="checkbox"/>	If there is no separate annex, which parts?	

If you want part of your response, your name or your organisation not to be published, can Ofcom still publish a reference to the contents of your response (including, for any confidential parts, a general summary that does not disclose the specific information or enable you to be identified)?

DECLARATION

I confirm that the correspondence supplied with this cover sheet is a formal consultation response that Ofcom can publish. However, in supplying this response, I understand that Ofcom may need to publish all responses, including those which are marked as confidential, in order to meet legal obligations. If I have sent my response by email, Ofcom can disregard any standard e-mail text about not disclosing email contents and attachments.

Ofcom seeks to publish responses on receipt. If your response is non-confidential (in whole or in part), and you would prefer us to publish your response only once the consultation has ended, please tick here.

Name

Signed (if hard copy)

Annex 4

Consultation question

Do you agree that the case for making changes requested by UK Broadband to its licence has been made? If not, why would it not be appropriate to vary UK Broadband's Wireless Telegraphy Public Fixed Wireless Access Operator Licence by (i) allowing application neutrality and (ii) increasing the permitted maximum in-band EIRP, and why would it not be appropriate to vary the licence as soon as practicable?

Annex 5

Impact Assessment

Introduction

- A5.1 The analysis presented in this annex represents an impact assessment, as defined in section 7 of the Communications Act 2003 (the Act).
- A5.2 Consistent with Ofcom's guidelines²⁹ on the use of impact assessments, this analysis:
- Defines the issue being considered and identifies the citizen/ consumer interest;
 - Defines the policy objective;
 - Identifies and assesses the options and identifies the impacts on stakeholders; and
 - Assesses the impact on competition.

The citizen and/or consumer interest

- A5.3 This document consults on Ofcom's consideration of an application from UK Broadband Limited ("UK Broadband") to vary its Wireless Telegraphy Public Fixed Wireless Operator 3.5 GHz³⁰ licence ("UK Broadband's 3.5 GHz licence") to:
- allow technology and application neutrality; and
 - increase the allowed power levels.
- A5.4 UK Broadband's current 3.5 GHz licence allows it to provide fixed wireless access services only. If Ofcom were to grant UK Broadband's request to vary its licence as requested this would allow UK Broadband to use the spectrum to provide a range of new services and adopt new technology. UK Broadband is proposing to use WiMAX technology to deliver fixed, mobile or portable broadband services. In the longer term, UK Broadband is envisaging it could choose different technologies and deployments to respond dynamically to changing circumstances. These new UK Broadband services are expected to deliver benefits for citizens and consumers as they will be services which currently have limited availability or have a different source of service delivery.
- A5.5 As set out by Ofcom previously in its spectrum framework review implementation plan documents, Ofcom's view is that where possible, citizen and consumer interests in relation to the allocation of spectrum are best served through spectrum trading and liberalisation. The granting of UK Broadband's application is consistent with Ofcom's approach to spectrum management in this regard.

²⁹ http://www.ofcom.org.uk/consult/policy_making/guidelines.pdf

³⁰ While this was originally called the "3.4GHz Public Fixed Wireless Access Auction", the majority of the frequency range lies within, or close to, the 3.5 GHz band. To avoid future confusion, Ofcom hereafter refers to this as "the 3.5 GHz band".

Ofcom's policy objective

A5.6 Ofcom has a principal duty 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. Further, in securing this principal duty Ofcom is required to secure the optimal use of the spectrum for wireless telegraphy. Therefore, the objective of the policy is to maximise the likelihood that the spectrum is used optimally, to generate economic benefits and to promote innovation and competition, thus ultimately creating benefits to consumers by reducing restrictions on spectrum use.

Options considered

The status quo

A5.7 Ofcom could decide not to grant the variation and maintain the current licence conditions. This would deny the possibility of using the spectrum for new services and is likely to result in a sub-optimal choice of technological deployments and services (with a consequent reduction of benefits from spectrum use). Maintaining the status quo could only be justified if these forgone benefits were more than outweighed by the need to avoid undesirable outcomes such as impairing competition or creating the risk of an unacceptable level of interference. Ofcom has concluded from the analysis presented in the main text of this consultation document that it does not consider maintaining the status quo would be justifiable, since granting more flexibility in the use of spectrum will on balance be beneficial.

A5.8 In particular, we have assessed in paragraphs 6.14-6.29 the potential for the creation of conditions that will strengthen competition. Furthermore, we have also identified potential additional benefits in our analysis of consumer benefits in paragraphs 6.2-6.10.

Options for a licence variation

A5.9 Ofcom has thus considered various options to permit a more flexible use of spectrum:

- Option 1) Removing the fixed provision constraint and mandating a specific set of applications or technology.
- Option 2) Removing the current constraints allowing for a technology and application neutral use and granting the power increase.
- Option 3) Removing the current constraints allowing for a technology and application neutral use without granting the power increase. Keeping the current power level could reduce the risk of a potential increase in interference to other communications. However, this option would create significant problems for the feasibility of using mobile WiMAX communications, significantly constraining effective spectrum use. For this reason Ofcom considers that the power increase should be permitted if a decision is taken to allow mobile use.

A5.10 Option 3 would create significant problems for the feasibility of using mobile WiMAX communications, significantly constraining effective spectrum use. For this reason Ofcom considers that the power increase should be permitted if a decision is taken to allow mobile use.

A5.11 The comparison of Option 1 and Option 2 involves a decision on whether use of spectrum should be granted on a technology and service neutral basis. The impact of these options are summarised in Table A1 below.

Table A1 technology and service neutrality

	Benefits	Costs/negative impacts
Option 1 – Mandate a specific service or technology	<p>Adjacent spectrum users have certainty on UK Broadband's applications.</p> <p>Might facilitate harmonisation of standards.</p> <p>Enables short run launch of mobile WiMAX hand held devices (if mobile WiMAX is the mandated technology).</p>	<p>Requires Ofcom to choose technologies and services.</p> <p>Could result in a sub optimal choice of technology or services.</p> <p>Could delay innovation and lead to lower benefits to consumers.</p> <p>Future uses would be constrained by specific technologies and applications chosen at present.</p> <p>Likely to lead to inefficient use of spectrum and require further regulatory intervention.</p>
Option 2 – Technology and service neutral approach	<p>Flexible use of spectrum will enable deployment of a variety of innovative service and devices without restrictions.</p> <p>Enables short run launch of mobile WiMAX services and hand held devices.</p> <p>Does not impose constraints on future use (both regarding applications and technologies).</p> <p>Likely to result in greater benefits since efficient use will be driven by consumer demand.</p>	<p>Users of adjacent spectrum face uncertainty over the nature of UK Broadband uses.</p>

A5.12 Ofcom considers that the above analysis suggests there are likely to be greater benefits and fewer potential negative impacts from Option 2. For this reason Ofcom considers that Option 2 should be preferred to Option 1.

Timing of removal of restrictions

A5.13 The lifting of the use restrictions (both under Options 2 and 3) could be granted as soon as practicable in 2007, following Ofcom's consideration of responses to this consultation or alternatively delayed by several years. As noted in paragraph 6.9, Ofcom considers that given the intention of UK Broadband to provide innovative services that rely on mobile WiMAX, delaying the licence variation would prevent most of the incremental beneficial impacts to consumers from the licence variation. Such a delay would be likely to result in the reduced provision of mobile broadband services in the UK over the next 2-3 years. This could in turn lead to further delays and lower take-up of similar deployments that rely on different spectrum frequencies and could be launched from 2010/2011 (including similar uses relying on 2.6GHz spectrum).

A5.14 Based on the analysis presented in the main text of this consultation document, Ofcom believes that there are insufficient countervailing risks offsetting the likely

benefits from granting the licence variation. This suggests that the variation should not be delayed beyond 2007.

Impact on stakeholders

Ofcom has considered the impact that Options 1 and 2 are likely to have on stakeholders. These impacts are summarised in Table A2 below.

Table A2 Stakeholder impacts

	Consumers	UK Broadband	Fixed broadband operators	Mobile broadband operators
Option 1 – Mandate a specific service or technology	<p>Might facilitate harmonisation of standards for new devices avoiding confusion and segmentation.</p> <p>Benefits from new services being brought to market .</p> <p>Benefits from stronger competitive pressure on other broadband operators if in the same market.</p>	<p>Grants more flexibility in use for UK Broadband compared to the status quo.</p> <p>Could result in a sub optimal choice of technology or services in the future.</p> <p>Could delay further innovation and lead to lower benefits to consumers.</p> <p>Future uses would be constrained by specific technologies and application chosen at present.</p>	<p>Face no uncertainty over the nature of UK Broadband uses.</p> <p>If in the same market, face more competition on a selected range of services (though impacts could be limited).</p>	<p>Face no uncertainty over the nature UK Broadband uses.</p> <p>If in the same market, face more competition on a selected range of services.</p>
Option 2 – Technology and service neutral approach	<p>Will enable the deployment of a variety of innovative services and devices .</p> <p>Likely to result in greater benefits since efficient use will allow consumer demand to be met in a less constrained fashion.</p> <p>Facilitates conditions for effective competition (for example by allowing product differentiation) if in a market with other operators.</p>	<p>Grants maximum flexibility and capability to respond to technological change and manage demand.</p> <p>The management of the company would thus be free to decide what it needed to do to respond to consumer need, maximise its profitability and benefit its shareholders.</p>	<p>Face uncertainty over the nature UK Broadband uses.</p> <p>If in the same market: face more competition (though impacts could be limited).</p>	<p>Face uncertainty over the nature UK Broadband uses.</p> <p>If in the same market, face more competition.</p>

A5.15 The above table suggests that Option 2 could create better conditions for the development of effective competition and efficient use of spectrum. It would, however, create more uncertainty over the nature of UK Broadband uses.

- A5.16 Ofcom considers that Option 2 is the better alternative in that it could create a better prospect for competition and innovation for the benefit of citizens and consumers.

Competition issues

- A5.17 Ofcom has considered whether the licence variation could negatively impact on competition in downstream markets.
- A5.18 Even assessing the case for negative impacts under the option that permits the maximum flexibility in the use of spectrum - see the analysis of competitive impacts presented in Section 6 - Ofcom does not believe the risk of competition concerns arising from the proposed variation is significant.

The preferred option

- A5.19 Ofcom's preferred option is to allow a technology and service neutral approach to use of the spectrum as soon as practicable in 2007. The main text of this consultation document has discussed extensively this preferred option. Ofcom deems that on balance this is the choice that facilitates the creation of benefits for citizens and consumers, in particular those from innovation and competition in wireless data communications, and is consistent with Ofcom's approach to spectrum management.

Annex 6

Summary of SFR: IP responses

A6.1 This annex sets out a summary of the responses to the questions in the Spectrum Framework Review: Implementation Plan which are relevant to the removal from 3.5 GHz licences of restrictions on providing mobile services. The questions were:

Question 8.3 Do you agree that it may be appropriate to allow a period of time to elapse following an auction before extending liberalisation to auctioned licences, through the removal of restrictions as to type of use and technology? Please comment on this issue either as a general matter, or in relation to particular classes of auctioned licences, such as the 3.5 GHz licences, or both.

Question 8.4 If your answer to question 8.3 is affirmative, do you have a view on the period that might be allowed to elapse before removing restrictions on the 3.5 GHz licences? We would also be interested in your views on whether we need to seek to resolve this issue at any particular time.

A6.2 The full text of the responses not marked confidential can be found on the consultation section of the Ofcom website at <http://www.ofcom.org.uk/consult/condocs/sfrip/sfip/responses/>.

Table A3 SFR:IP Issues Summary

Issue raised	Comment	Ofcom response
Auctioned licences	Any change at the time would be wholly unjustifiable - Nomad	Since the 2003 auction the broadband market and technology have changed significantly, and maintaining the restrictions on service provision and power limits within UK Broadband's licence is unjustifiable, particularly taking account the benefits likely to result from their removal.
	The terms of auctioned licences should not be changed unless the benefits clearly outweighed the effects on investment incentives and competition. – H3G	
	It would be perverse to change from fixed unless those adversely affected were compensated. But went on to say that a fair period for variation would be at the first renewal date, or earlier if compensation was given. - Wales Broadband Stakeholder Group	
In favour	Auctioned spectrum should be liberalised from the start to the greatest extent possible - BT	The removal of licence restrictions is central to Ofcom's approach to spectrum management and Ofcom believes that it will result in a number of economic benefits, including increased scope for innovative use.
	Supported a fully liberalised market - Pipex.	
	Ofcom should consider this in the light of rural broadband requirements. The spectrum would be relatively dormant until mobility was allowed. - Kingston	
Timing	Liberalisation of 3.5 GHz for mobile use should not occur before the end of 2012. - T-Mobile	Delaying the licence variation would prevent most of the incremental beneficial impacts to consumers from the licence variation. There are no significant countervailing risks
	The timing of transition from one spectrum regime to another should take	

	account of technology innovations. Transition could be appropriate around 2007-8, Recommended alignment with other European states. - Siemens	offsetting the likely benefits from granting the licence variation. This suggests that the variation should not be delayed beyond 2007. The impact on the market of the variation of UK Broadband's licence is considered in section 6 of this document. Ofcom is planning for the award early in 2008 of the 2.6 GHz band Ofcom is planning to consult on the liberalisation of the 2G licences in forthcoming months. It is also planning early in 2008 to award licences in the 2.6 GHz band, (which Orange refers to as the 3G expansion band).
	There should be a period of time before auctioned licences were liberated. Network operators were in the best position to advise on the appropriate time period. - Philips	
	It would be inequitable to allow liberalisation to 2G or 3G services prior to such flexibility being provided to incumbents. - O ₂	
	Liberalisation of 3.5 GHz for mobile use should not occur before the end of 2012. - T-Mobile	
	UKB should be allowed to provide 3G services at the same time as 2G liberalisation and the release of further 3G spectrum, which should be in 2008. - Vodafone	
	The period that should elapse before liberalisation should be no shorter than the transition period which applies to mobile services generally and might be linked to the 3G expansion band auction. Ofcom should first undertake a market analysis to identify the likely market consequences. - Orange	
Competition/ discrimination	Saw 3.5 GHz liberalisation as giving UKB a windfall gain while harming the interests of those who might have bid in the auction. It would also be discriminatory in respect of the conditions imposed in 3G and 2G licences. - T-Mobile	Ofcom considers that there do not appear to be a distortion to competition or concerns regarding the existence of potentially inefficient uses of spectrum to justify introducing an additional licence fee. A state aid can only arise where there is a distortion of competition. Further, Ofcom is acting in a manner consistent with what is required by the legal duty not to preserve wireless telegraphy licence conditions that cease to be objectively justifiable or proportionate. Ofcom's view is that the exercise of that duty (which is conferred by EU law) cannot, in any event, constitute a breach of EU state aid rules. These issues are discussed in paragraphs 6.30-6.41 of this document.
	Important that liberalisation did not distort competition, such as conferring a windfall gain. Failure to impose a licence fee to reflect the increased value of the licence would constitute a state aid if it conferred an advantage over other licensees in a comparable position. - Orange	

Definitions	Recommended removing restrictions to allow 'low mobility' (i.e. nomadic use). - Siemens	Licences should be free of unnecessary restrictions on service provision and the variation of UK Broadband's licence should not and need not include definitions of nomadic use or mobility.
	A clear definition of mobility was needed - Pipex	

Annex 7

UK Broadband's Wireless Telegraphy Public Fixed Wireless Access Licence (3.5 GHz)

- including proposed changes if the variation is
made

Wireless Telegraphy Act 2006

Office of Communications (Ofcom)

ORIGINAL TEXT

PUBLIC FIXED WIRELESS ACCESS OPERATOR LICENCE (3.4GHz)

CHANGES TO:

Licence Category: SPECTRUM ACCESS 3.5 GHz

This Licence replaces the licence issued by Ofcom on 1 April 2004 to UK Broadband Limited.

Licence No: **268454**

Date of issue: **16 May 2007**

1. The Office of Communications (Ofcom) grants this licence to

UK Broadband Limited
Company Reg NO: 04713634
(“the Licensee”)
78 Brook Street
3rd Floor
London
W1K 5EF

to establish, install and use radio transmitting and receiving stations and/or radio apparatus as described in the Schedule (the “Radio Equipment”) subject to the term, set out below.

Licence Term

2. This Licence shall continue in force until 17 July 2008 unless earlier revoked by Ofcom in accordance with paragraph 4 below or surrendered by the Licensee.

3. Subject to due payment of the additional fees set out in paragraph 9, the Licensee shall have the option to extend this Licence for either one (1) or two (2) successive periods of five (5) years each by serving written notice to that effect on Ofcom:

(a) in respect of the first five year period, at least twelve (12) months prior to the fifth anniversary of the date of first issue of the Licence (17 July 2003); and

(b) in respect of any second five year period, by serving a further notice at least twelve (12) months prior to the tenth anniversary of the date of first issue of the Licence.

Licence Variation and Revocation

4. Pursuant to Schedule 1(8) of the Wireless Telegraphy Act 2006 (the "Act"), Ofcom may not revoke this Licence under Schedule 1(6) of the Act except:

(a) at the request of, or with the consent of, the Licensee;

(b) in accordance with paragraph 9 of this Licence;

(c) if there has been a breach of any of the terms of this Licence;

(d) if, in connection with the transfer or proposed transfer of rights and obligations arising by virtue of the Licence, there has been a breach of any provision of regulations made by Ofcom under the powers conferred by section 30(1) and section 30(3) of the Act;

(e) if the Licensee is found, to the reasonable satisfaction of Ofcom, to have been involved in any act, or omission of any act, constituting a breach of the rules and procedures as set out in the Wireless Telegraphy Notice issued by the Secretary of State pursuant to regulation 4 of the Wireless Telegraphy (Public Fixed Wireless Access Licences) Regulations 2002 (the "Regulations");

(f) in accordance with Schedule 1 paragraph 8(5) of the Act;

5. Ofcom may only revoke or vary this Licence by notification in writing to the Licensee and in accordance with Schedule 1(7) of the Act.

Changes

6. This Licence is not transferable. The transfer of rights and obligations arising by virtue of this Licence may however be authorised in accordance with regulations made by Ofcom under powers conferred by section 30(1) and section 30(3) of the Act.

7. The Licensee must give prior notice to Ofcom in writing of any proposed change to the Licensee's name and address from that recorded in the Licence.

Fees

8. The licence fee paid in respect of this Licence is £6,955,000 (the “Licence Fee”).
9. The Licensee shall also pay to Ofcom an amount equal to the Licence Fee:
 - (a) in the case of a first five (5) year extension, on or prior to the fifth anniversary of the date of first issue of this Licence; and
 - (b) in the case of a second five (5) year extension, on or prior to the tenth anniversary of the date of first issue of this Licence,

in each case in cash and without set-off or counterclaim; failing which Ofcom may revoke this Licence.
10. The Licensee shall also pay interest to Ofcom on any amount which is due under the terms of this Licence or provided for in any regulations made by Ofcom under sections 12 or 13 of the Act, such interest to be charged from the date that the principal amount falls due until the date of payment, at the then applicable Bank of England base rate.
11. If the Licence is surrendered or revoked, no refund, whether in whole or in part of any amount which is due under the terms of this Licence or provided for in any regulations made by Ofcom under sections 12 or 13 of the Act will be made, except at the absolute discretion of Ofcom in accordance with regulation 5 of the Regulations.

Radio Equipment Use

12. The Licensee shall ensure that the Radio Equipment is established, installed and used only in accordance with the provisions of this Licence. Any proposal to amend any detail specified in this Licence must be agreed with Ofcom in advance and implemented only after this Licence has been varied or reissued accordingly.
13. The Licensee shall ensure that the Radio Equipment is operated in compliance with the terms of this Licence and is used only by persons who have been authorised in writing by the Licensee to do so and that such persons are made aware of, and of the requirement to comply with, the terms of this Licence.

Access and Inspection

14. The Licensee shall permit a person authorised by Ofcom:
 - (a) to have access to the Radio Equipment; and
 - (b) to inspect this Licence and to inspect, examine and test the Radio Equipment,

at any and all reasonable times or, when in the opinion of that person an urgent situation exists, at any time to ensure the Radio Equipment is being used in accordance with the terms of this Licence.

Modification, Restriction and Closedown

15. A person authorised by Ofcom may require any of the radio stations or radio apparatus that comprise the Radio Equipment to be modified or restricted in use, or temporarily or permanently closed down immediately if in the opinion of the person authorised by Ofcom:

- (a) a breach of a term of the Licence has occurred; and/or
- (b) the use of the Radio Equipment is causing or contributing to undue interference to the use of other authorised radio equipment.

16. In the event of a national or local state of emergency being declared, Ofcom may require any of the radio stations or radio apparatus that comprise the Radio Equipment to be modified or restricted in use, or temporarily closed down either immediately or on the expiry of such period as may be specified. Ofcom may only exercise this power after a written notice has been served on the Licensee or a general notice applicable to holders of a named class of Licence has been published.

Geographical Boundaries

17. This Licence authorises the Licensee to establish, install and use the Radio Equipment only in the United Kingdom.

Interpretation

18. In this Licence:

- (a) the establishment, installation and use of the Radio Equipment shall be interpreted as the establishment and use of stations and the installation and use of wireless telegraphy apparatus as specified in section 8(1) of the Act; and
- (b) the expressions “undue interference,” “wireless telegraphy station” and “wireless telegraphy apparatus” shall be construed in accordance with sections 115 & 117 of the Act.

19. The schedule to this Licence forms part of this Licence together with any subsequent schedules which Ofcom may issue as a variation to this Licence at a later date.

20. The Interpretation Act 1978 shall apply to this Licence as it applies to an Act of Parliament.

Issued By Ofcom

Signed by

For the Office of Communications

SCHEDULE 1 TO LICENCE NUMBER:268454

Schedule Date: 16 May 2007

ORIGINAL TEXT

Licence Category: PUBLIC FIXED WIRELESS ACCESS OPERATOR

CHANGES TO:

Licence Category: SPECTRUM ACCESS 3.5 GHz

1. Description of Radio Equipment Licensed

ORIGINAL TEXT

In this Licence, the Radio Equipment means Public Fixed Wireless Access ("PFWA") transceivers including Access Point Transceivers (known as Hub Stations, Central Stations and Base Stations), Customer Premises Equipment (known also as terminal Stations) and Radio Relay Repeaters forming part of the network.

CHANGES TO:

In this Licence, the Radio Equipment means any station for wireless telegraphy or apparatus for wireless telegraphy.

2. Interface Requirements for the Radio Equipment use

Use of the Radio Equipment shall be in accordance with the following Interface Requirement:

IR 2015 for Public Fixed Wireless Access radio systems operating within the 3 to 11 GHz frequency bands.

3. Special Conditions relating to the Operation of the Radio Equipment

(a) During the period that this Licence remains in force and for 6 months thereafter, the Licensee shall compile and maintain accurate records of:

ORIGINAL TEXT

(i) the number and location of each Access Point transceiver installed by the Licensee; and

(ii) the following details relating to the Radio Equipment:

CHANGES TO:

(i) the following details relating to the Radio Equipment where the Radio Equipment is operated from a fixed location:

- a) postal address;
 - b) National Grid reference (to 100 metres resolution);
 - c) antenna height (above ground level) and type, and bearing east of true north;
 - d) radio frequencies used by the Radio Equipment; and
- (ii) a statement of the number of subscribing customers,

and the Licensee must produce these records if requested by a person authorised by Ofcom.

- (b) The Licensee shall inform Ofcom of the address of the premises at which this Licence and the information detailed at sub-paragraph 3(a) of this Schedule shall be kept.
- (c) The Licensee must submit to Ofcom copies of the records detailed in sub-paragraph 3(a) of this Schedule at such intervals as Ofcom shall notify to the Licensee.
- (d) The Licensee must also submit to Ofcom in such manner and at such times as Ofcom requests all information relating to the establishment, installation or use of the Radio Equipment as is reasonably requested for the purpose of verifying compliance with this Licence or for statistical purposes.
- (e) The Licensee must ensure that the Radio Equipment is established and installed only for terrestrial use.

4. Site Clearance Requirements

- (a) Except where specified in sub-paragraph 4(b) below, the Licensee must obtain from Ofcom a valid site clearance certificate prior to establishing, installing or using the Radio Equipment.
- (b) Sub-paragraph 4(a) does not apply to:
 - (i) base transceiver stations incorporating transmitters radiating not more than 17 dBW ERP; and/or
 - (ii) aerial systems, which do not extend beyond thirty (30) metres above ground level, or which do not increase the height of an existing building by more than five (5) metres (whichever is the higher).

5. Coordination

The Licensee must operate the Radio Equipment in accordance with any co-ordination procedure notified by Ofcom.

6. Permitted Frequency Bands

The Licensee is authorised to operate the Radio Equipment in the following frequency ranges:

Lower Frequency Block	3480 – 3500 MHz
Upper Frequency Block	3580 – 3600 MHz

7. Maximum Permissible EIRP

The Licensee shall ensure that the Radio Equipment conforms to the following EIRP limits:

ORIGINAL TEXT

Maximum EIRP per MHz +14 dBW/MHz

CHANGES TO:

Maximum EIRP +29 dBW/MHz

Except for mobile terminals, which shall conform to the following EIRP limit:

Maximum EIRP -5 dBW/MHz

In addition to this, the Licensee may be required to take additional measures to ensure that the establishment, installation and use of the Radio Equipment does not cause undue interference to receiving stations and/or radio apparatus operated by a neighbouring licensee.

8. ITU Emission Designation

(a) Upon the date of issue of this Licence, the Licensee shall notify Ofcom in writing of the ITU Emission Designation applicable to the Radio Equipment. The Licensee may change the ITU Emission Designation for the Radio Equipment at any time upon not less than thirty (30) days' prior written notification to Ofcom.

(b) The Licensee shall install, maintain and use the Radio Equipment in accordance with the ITU Emission Designation notified from time to time to Ofcom.

9. Permissible Out of Block Emissions

The Licensee shall ensure that Out of Block Emission from the Radio Equipment shall conform to the following:

Offset from edge of block	Maximum Permitted Radiated Level
0 to 3.5 MHz	- 43 dBW / MHz
Beyond 3.5 MHz	- 56 dBW / MHz

10. Interpretation

In this Schedule:

HIGHLIGHTED TEXT PROPOSED TO BE DELETED

(a) “Access Point Transceiver” means any station that provides connection between the PFWA network and another telecommunications network;

(b) “Base Station” means a radio transmitter with or without a receiver installed to provide a communications service typically used in mobile or broadcasting radio systems;

(c) “Customer Premises Equipment” means any station that provides connection between the PFWA network and an end-user, not including connection to any telecommunications equipment forming part of any other public telecommunications system;

(d) “dBW” means the power level in decibels (logarithmic scale) referenced against 1 Watt (i.e. a value of 0 dBW is 1 W);

(e) “EIRP” means the equivalent isotropically radiated power. This is the product of the power supplied to the antenna and the antenna gain in a given direction relative to an isotropic antenna (absolute or isotropic gain);

(f) “Emission Designation” shall have the meaning given in the ITU Radio Regulations RR 4-2 and Appendix 6 Parts A 7B;

(g) “ERP” means the effective radiated power. This is the power fed to the antenna multiplied by the maximum gain of the antenna with respect to a half-wave dipole;

(h) “IR” means the United Kingdom Radio Interface Requirement published by the Radiocommunications Agency of the Department of Trade and Industry (RA) in accordance with Article 4.1 of Directive 1999/5/EC of the European Parliament and of the Council on Radio Equipment and Telecommunications Terminal Equipment (R&TTE) and mutual recognition of their conformity as implemented in the UK by the Radio Equipment and Telecommunications Equipment Regulations 2000 S.I. 2000/7/730;

(i) “ITU” means International Telecommunications Union;

(j) “Maximum Permitted Radiated Level” (of Out of Block Emissions) is the product of the power supplied to the antenna and the antenna gain in a given direction relative to an isotropic antenna that is outside the Licensee’s Frequency Block;

(k) “Out of Block Emission” means radio frequency emissions generated by the Radio Equipment and radiated into the frequency bands adjacent (in terms of frequency) to the Licensee’s Permitted Frequency Bands;

(l) "PFWA" means Public Fixed Wireless Access: the provision by means of a wireless communication system of wireless communications links over which data may be transmitted and received on demand; and

(j) "Radio Relay Repeater" means any station of the network that forwards a communication to another station of the network.

Mobile & Broadband Unit
Office of Communications

Annex 8

UK Broadband's request and supporting documentation

This document is published separately at:

http://www.ofcom.org.uk/consult/condocs/bb_application/