



department for  
**culture, media  
and sport**

### **Seminar 3: Maximising the value of spectrum to support growth and innovation in the market**

#### **Summary**

To make the UK Europe's technology hub will require greater levels of connectivity and higher bandwidths to enable new and existing businesses to innovate and grow and to attract the best global businesses to invest here. Therefore the Government is developing a world-class, modern digital infrastructure and has already made significant progress through investment in broadband and mobile coverage.

This seminar will consider ways to achieve this broad aim, with a particular focus on maximising the value of spectrum and supporting business needs and growth in the market, in areas such as:

- Facilitating access to spectrum for SMEs
- Exploring a series of measures to encourage more spectrum trading
- Ensuring the approach to managing licence exempt spectrum is appropriate

#### **Context**

**1.1** A modern digital communications infrastructure is a key component of sustainable economic growth. Access to fast, reliable, competitively-priced connectivity helps businesses reach new markets, strengthen relationships with their customers and clients and create new products and services.

**1.2** There is a clear evidential link between efficient infrastructure and economic growth, with businesses able to capitalise on the international reach of the Internet to maximise revenues: SMEs utilising the Internet have reported more than double the total export revenue as others.

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- 1.3 According to a recent study, the Internet is also responsible for creating 2.6 jobs for every one made obsolete<sup>1</sup>. Across all sectors of the economy, businesses able to take advantage of high-speed broadband technology and build a strong online presence are growing more than twice as fast as those with no or minimal presence.
- 1.4 Consumers are adopting faster, more widespread data and voice mobile connectivity: mobile data traffic levels have increased by a factor of five between 2009 and 2011; they are predicted to grow by a factor of more than 20 by 2013 and a factor of 35 by 2014<sup>2</sup>. The Government wants to release spectrum to help meet this growing demand, and therefore wants to see the 4G auction (for two bands: 800MHz and 2.6GHz) proceed as soon as possible. It is also why the Government has embarked on a programme to free up publicly held spectrum, with a commitment to release at least 500MHz of spectrum currently in public hands over the next 10 years.

### *Spectrum assignment*

- 1.5 Spectrum is a valuable and limited resource. Under the current legislation, Ofcom is required to make spectrum available on the basis of objective, transparent, non-discriminatory and proportionate criteria. For the most part these conditions are being met through market mechanisms, such as auctions, which are widely regarded as being the most effective means of assignment.
- 1.6 The way in which spectrum assignment and the spectrum market operates has a role to play in allowing the development of new and innovative wireless-based services to drive growth. The existing policy framework is based around assignment on an open, transparent and non-discriminatory basis, liberalisation and trading. Liberalisation of bands (opening up bands that had previously been restricted to a particular service and/or technology) is becoming more prevalent; but this poses policy challenges in balancing the needs of existing users of spectrum against the opportunities for new, potentially higher value users.

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<sup>1</sup> McKinsey Global Institute (May 2011), "*Internet matters: The Net's sweeping impact on jobs, growth and prosperity*"

<sup>2</sup> US Federal Communications Commission

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- 1.7 The use of radio spectrum underpins a wide range of uses. **Figure 1**, below, gives a high-level overview of some of the more familiar uses. However, with increasing demand for spectrum for an ever increasing variety of uses, it is an appropriate time for Government to take stock of the needs of the economy and society at large and to what extent the market will or can be enabled to deliver them.

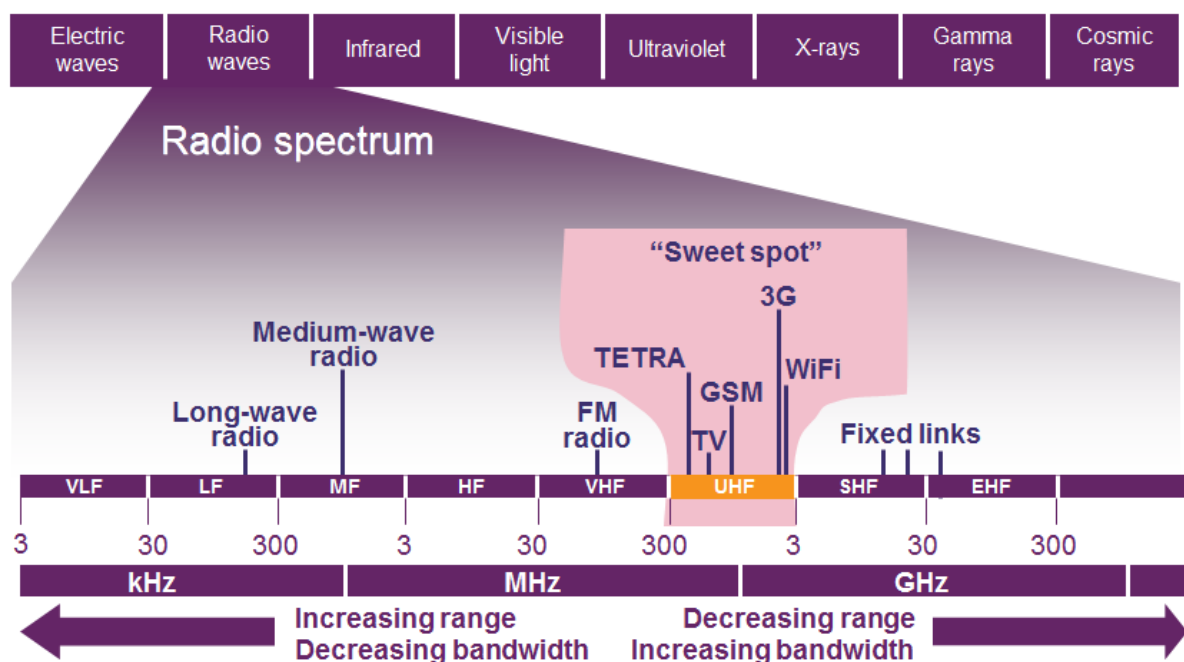


Figure 1 – Uses of Spectrum (source: Ofcom)

- 1.8 There are four broad ways in which spectrum can be made available: assignment made through market mechanisms (usually auction, based on price); administrative allocation (otherwise known as a beauty contest, based on merit); granting licences on allocation with pricing attached to encourage efficient assignment; and making spectrum use licence-exempt.
- 1.9 In the UK, most recent assignments where demand for specific spectrum bands exceeded availability and spectrum was available in large contiguous blocks were achieved through auction. The auction of spectrum will normally result in spectrum being acquired by whoever can make the most efficient and effective use of it, resulting in the greatest value to the economy.

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1.10 In considering the assignment of spectrum Ofcom is required to assess whether wider social benefits, over and above economic ones, might need to be taken into account and if this might suggest that administrative assignment would be a more appropriate route to take, notwithstanding that there are risks associated with that approach.

- *Could Ofcom's duties be clarified in relation to spectrum assignment, and if so how?*

### *Spectrum allocation for SMEs*

1.11 Greater use of administrative assignment may provide scope to address any disadvantage that smaller, innovative players might face in an auction. There may be a range of reasons why smaller businesses cannot participate effectively. For example, if they cannot access capital markets to fund the acquisition of spectrum they may not be in a position to compete with large, well-funded organisations in a purely economic auction. If there are no alternative ways for users to access spectrum, this may stifle innovative ideas and the potential to drive future growth areas. The ability of SMEs to organise themselves collectively to be able to compete with larger entities in an auction may also be constrained. Ofcom has recognised this form of market failure in the past, for example in the case of programme makers and special events users, and there is an existing model to address this problem where spectrum is made available to interested companies by a band manager.

1.12 Ofcom's existing duties include the desirability of encouraging investment and innovation in relevant markets and promoting the economic and other benefits that arise from the use of wireless telegraphy. Under these existing duties, Ofcom considers the requirements of business and how best to meet these demands. However, a specific recognition and consideration of the role of smaller businesses in the provision of economic and socially valuable wireless based services could be justified.

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- *Does Ofcom have the necessary tools to address SME needs, for example by facilitating through a third party ‘band manager’, who would acquire spectrum and enter into leasing arrangements with companies interested in accessing spectrum?*

### *Ofcom’s powers and duties*

1.13 In addition there are categories of non-commercial users, such as the emergency services, which require the use of spectrum to operate, but who may be disadvantaged in an auction in comparison to commercial companies, such as mobile operators. In part this is because there is a greater risk that the wider social value of such services is not reflected effectively in their bids in any auction. In some cases it may be that the Government is best placed to determine the most appropriate approach to a making spectrum available for these uses if appropriate, invoking the powers of the Secretary of State under section 5 of the Communications Act 2003 . A case would need to be made demonstrating a safety- or security-critical requirement that cannot reasonably be met through existing allotments or allocations, that cannot reasonably be met through the market, and that there is no alternative means of providing the service. There are of course trade-offs to be considered if the option of administrative assignment were to be pursued and these would need to be examined in detail on a case-by-case basis.

1.14 Promoting use of spectrum to support economic growth and growing demand might also be achieved if Ofcom were given a power to conduct incentive auctions. An incentive auction is a voluntary, market-based tool to compensate existing spectrum licensees for returning their licences to make spectrum available for innovative new uses like mobile broadband. Ofcom would auction the spectrum that licensees voluntarily return, with licensees retaining a portion of the auction proceeds. In the United States, the Federal Communications Commission is currently seeking authorisation from Congress to carry out such auctions.

- *Would this bring benefits in the UK?*

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### *Trading*

1.15 Assignments by Ofcom are only one way spectrum can be accessed; trading and in future leasing spectrum are also a means to get access. An increasing number of licences have been made tradable by Ofcom, but the level of trades remains low. Although there may be good reasons why companies might acquire spectrum and subsequently not use it but fail to trade it, the relative scarcity of spectrum, particularly at lower frequencies, and the objective of effective and efficient use of spectrum demands are such that some mechanism for addressing prolonged non-use of spectrum should be considered. Some have suggested that trading has not yet taken off because the market is not ready and that it is too soon to make changes to the regulatory framework, while others contend that low levels of trading need to be addressed soon.

1.16 A “use it or lose it” approach has been suggested in the past, where non-use after a period of time would result in the licence being revoked. Drawbacks to this approach include possible distortion on any bidding process and the possibility that inefficient use will result if the licence holder is under an unreasonable time pressure to use it. Although Ofcom has powers under its competition remit to deal with any anticompetitive spectrum hoarding, arguably there needs to be greater clarity over the circumstances in which Ofcom would exercise them.

1.17 *What views do you have of the following possible measures that could be put in place to encourage trading:*

- First, a power for Ofcom to review the use of spectrum five years after it has been assigned, whether through auction or beauty contest, to assess whether the spectrum has been brought into use. At the same time Ofcom would also review any changes in the level of demand for that spectrum and the Secretary of State could request such a review at other times. Based on their assessment, Ofcom would have the discretion, if they deemed it necessary, to invoke a power of compulsory purchase (see below). Although this may introduce some degree of uncertainty to potential acquirers, it is reasonable that some degree of scrutiny is present to ensure efficient use. Article 9 of the Radio Spectrum Policy Programme in Europe requires an inventory of existing uses of spectrum. Although the

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details of how this audit is to be conducted are still to be determined, this may provide an alternative method of establishing use;

- Secondly, a requirement for Ofcom to set out clearly the process to be adopted if any potential user felt they were being unreasonably denied access to spectrum (by draconian terms and conditions or an outright refusal);
- Thirdly, a compulsory purchase scheme to free up spectrum that Ofcom and/or the Government decide must be made available for alternative use to deliver the most value for society. There are circumstances where the potential value delivered by spectrum use is sufficiently higher than the current value that it is important to secure a change of use faster than market transactions would, and also where there are fixed constraints actively preventing market reassignment to the most valuable use. In such circumstances, Ofcom has powers to revoke or amend licences, but there are not at present clear processes or principles for doing so, including whether and what level of compensation or other funding should be made available to secure this efficiently. Such a scheme could also work on a temporary basis for "renting back" spectrum if there is a very high-value short-term use that could be made of it, outweighing the cost of the temporary reduction in the existing service;
- Fourthly, views are sought on any existing regulation acting as a barrier to trading – including trading public sector holdings – that could be removed. These could include barriers to the operation of spectrum brokers, to the ability of third parties to conclude binding commercial agreements concerning levels of interference they will cause each other, or to addressing inadequate receiver standards preventing efficient spectrum use.

### *Licence-exempt spectrum*

1.18 Licence-exempt spectrum is spectrum that may be used freely without the need for a specific licence from the regulator or an authorised spectrum manager. The use of licence-exempt spectrum has led to several ground-breaking products and services, the most familiar of which is arguably Wi-Fi local area networks. These can make significant contributions to the economy; assessments conducted for Ofcom suggest the net present value in the UK might be as high as

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£100 billion over the next 20 years<sup>3</sup>. The value to the European economy is predicted to increase by an average of €776 billion over the next nine years<sup>4</sup>.

**1.19** In their Licence Exemption Framework Review, Ofcom stated that they estimated little additional spectrum would be needed for licence-exempt purpose in the foreseeable future. However, the recent explosion of devices that use Wi-Fi, such as smart phones, tablets and e-books, might suggest a changing picture and also raises the possibility that further innovative use could be stimulated by licence-exempt access to spectrum.

**1.20** Work by Perspective in 2009, for example, estimated that the combined economic value to the US economy of just three licence-exempt applications modelled, (enhanced broadband access in homes through Wi-Fi; Wi-Fi delivering voice services and wireless access to patient records in hospitals; and Radio Frequency Identification Tag (RFID) tracking in clothing retail stores) is likely to be \$16 - 37 billion a year over the coming 15 years. Furthermore, they estimate that these applications will represent only 15 per cent of the total market for licence-exempt devices in 2014. The improvements to Wi-Fi from having access to lower-frequency high-bandwidth spectrum, such as the white spaces, could generate additional economic value of \$3.9 – 7.3 billion a year over the coming 15 years.

**1.21** Extending access to, and the availability of, spectrum for innovative services could also involve more sharing in licensed bands or more flexible rules for currently exempt spectrum. Ofcom are looking at the occupancy level of current exempt bands, and are assessing the changing demand for licence-exempt spectrum and how the management of it can be improved.

- *What would be the impacts of changing the amount of and approach to licence-exempt spectrum in order to improve innovation and growth, and what evidence is there to support this?*

<sup>3</sup> Licence Exempt Framework Review, Ofcom, December 2007

<sup>4</sup> Perspectives on the value of shared spectrum access workshop, SCF Associates Ltd, 16 December 2011, Brussels



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### Next steps:

- The seminar to which this paper relates will be taking place on 12 July.
- Within two weeks of the seminar, a written summary, and video footage of the panel discussions will be published on the DCMS website.
- The papers are available in 'commentable' format online, for respondents to submit their comments on specific questions in the text.

### Responses:

- If you would like to submit to us any comments or papers on the issues raised in this paper or in the seminars, we would ask that you do so by *14 September, 2012*,
- to either:
  - The Communications Review inbox: [communications.review@culture.gsi.gov.uk](mailto:communications.review@culture.gsi.gov.uk) ;  
**or**
  - DCMS Communications Review team  
2-4 Cockspur Street,  
London SW1Y 5DH

### Publication:

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