



Ofcom's framework for spectrum sharing

EE's response to the consultation

October 2015

Non-confidential version - Confidential redactions are marked
with [X]

Table of contents

Table of contents	2
1. Introduction and executive summary.....	3
2. Ofcom's duties and regulatory principles	4
3. Market-driven improvements in efficient spectrum use.....	6
4. The lack of evidence of demand for further efficient spectrum sharing.....	8
5. The need to undertake an assessment of the costs and benefits of efficient spectrum sharing	9

1. Introduction and executive summary

EE Limited (“EE”) welcomes the opportunity to respond to Ofcom’s framework for spectrum sharing consultation, published on 31 July 2015 (the “Consultation”).

EE’s response makes the following key points:

- Ofcom’s principal spectrum duty is to secure the optimal use of spectrum. Ofcom’s own regulatory principles also state that Ofcom will operate with a bias against intervention and will strive to ensure its interventions will be evidence-based.
- Increased spectrum sharing is only likely to lead to more efficient use of spectrum if the sharing generates higher value use of spectrum.
- There have been a number of successful cases of spectrum sharing that have led to increased efficiency in use of spectrum, including in the mobile sector, where Mobile Network Operators (“MNOs”) effectively share their spectrum with Mobile Virtual Network Operators (“MVNOs”) by providing wholesale mobile services to these providers. This has been largely driven by competition in the UK mobile sector, and also, without the need for intervention (in the form of an access regime) by Ofcom.
- The introduction of market tools such as spectrum trading and leasing has also largely enabled more efficient use of available spectrum within the market and with a minimum of intervention by Ofcom.
- Despite this, Ofcom provides no clear evidence in the Consultation that there is demand for further spectrum sharing and that users are being denied efficient sharing opportunities that would lead to more efficient use of spectrum. It is therefore unclear what problem Ofcom is seeking to address by developing a framework for spectrum sharing.
- Ofcom needs to provide robust evidence that (i) there is demand for efficient spectrum sharing (ii) there are barriers preventing parties from expressing this demand and (iii) that removing these barriers through regulatory intervention would facilitate more efficient use of spectrum than would otherwise result from not intervening.
- If Ofcom is able to establish, on the basis of robust evidence, that these three criteria are met, then in order to balance its spectrum duties with its other considerations (e.g. to promote efficient investment and innovation) Ofcom would need to undertake an assessment of the costs, benefits and risks of sharing on a band-by-band basis before proposing any form of regulatory intervention to encourage greater efficient spectrum sharing.
- EE notes that there are significant risks associated with the interventionist tools that Ofcom is considering whether to adopt in the Consultation, in order to address any supposed (but as yet unproven) barriers to efficient spectrum sharing. We set out some of the risks in more detail in this response.

2. Ofcom's duties and regulatory principles

When considering any framework for spectrum sharing, as a matter of national law Ofcom must have regard to its general statutory duties in section 3 of CA 03, its duties under section 3 of WTA 06 and to the EU regulatory objectives set out in Articles 8 and 9 of the Framework Directive. Further, Ofcom should also comply with its own regulatory principles. We set out below the relevant duties and regulatory principles below.

2.1 Ofcom's duties

Ofcom's principal duties under s.3 of CA 03 are "*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*". In fulfilling this duty, EE considers that a number of Ofcom's other statutory duties are particularly relevant to any consideration of a framework for spectrum sharing. In particular under S.3(2) of CA 03 Ofcom is required to secure "*the optimal use for wireless telegraphy of the electro-magnetic spectrum*" and under S. 3(2) of WTA 06 Ofcom has a duty to have particular regard to the desirability of promoting both the efficient management and use of spectrum and competition in the provision of electronic communications services. Further, under s.3(1) of WTA 06, in carrying out its radio spectrum functions, Ofcom must have regard to both present and future demand for the use of the spectrum for wireless telegraphy.

These national law duties correspond with Ofcom's duties under Articles 8 and 9 of the Framework Directive to:

- encourage "*efficient use and ensure the effective management of radio frequencies and numbering resources*" (Art. 8(2)(d));
- "*ensure the effective management of radio frequencies for electronic communication services in their territory in accordance with Articles 8 and 8a [of the Framework Directive]*" and "*ensure that spectrum allocation used for electronic communications services [is] based on objective, transparent, non-discriminatory and proportionate criteria*" (Art 9(1)).

It is clear that Ofcom's relevant statutory duties require Ofcom to ensure that spectrum sharing opportunities should only be considered where there is clear evidence that those opportunities will promote both allocative and productive efficiency in the use of spectrum.

2.2 Ofcom's regulatory principles

Ofcom's own regulatory principles¹ state that Ofcom will:

- "operate with a bias against intervention and will strive to ensure its interventions will be evidence-based."
- "intervene where there is a specific statutory duty to work towards a public."

¹ <http://www.ofcom.org.uk/about/what-is-ofcom/statutory-duties-and-regulatory-principles/>

- “strive to ensure its interventions will be evidence-based, proportionate, consistent, accountable and transparent in both deliberation and outcome.”
- “always seek the least intrusive regulatory mechanisms to achieve its policy objectives.”
- “research markets constantly and will aim to remain at the forefront of technological understanding.”

EE considers that on this basis it is incumbent on Ofcom to provide strong evidence that there is demand for efficient spectrum sharing, which in the absence of intervention by Ofcom, is being unmet by the market, before considering any interventionist measures to increase spectrum sharing (i.e. Ofcom should only consider intervention where there is strong evidence that this would better meet Ofcom’s statutory duties). In the absence of such evidence Ofcom should always favour non-interventionist measures and allow the market to determine the optimal use of spectrum. Ofcom should also have regard to the risks associated with an interventionist approach.

3. Market-driven improvements in efficient spectrum use

In the Consultation Ofcom has set out a framework for spectrum sharing which it believes could help facilitate greater sharing. EE considers that spectrum sharing should only be considered desirable where it reflects an efficient use of spectrum, that is, that it is held by the highest value user (i.e. spectrum sharing is a potential means to an end but not an end in itself). EE notes that in general the market should ensure that spectrum is allocated efficiently, and only where there is clear evidence that the market is unable to do so should an interventionist approach be considered. Whilst not fully acknowledged by Ofcom in the Consultation, there is clear evidence that the market has to date driven significant improvements in efficient use of spectrum, through efficient spectrum sharing, trading and leasing, all of which have been achieved with minimal intervention by Ofcom.

EE notes that there have been a number of successful cases of efficient spectrum sharing, which have arguably led to an improvement in the efficient use of spectrum with minimal intervention from Ofcom. In the mobile sector for example, Mobile Network Operators (“MNOs”) effectively share their spectrum with Mobile Virtual Network Operators (“MVNOs”) by providing wholesale mobile services to these providers. This is a highly optimal approach to efficient spectrum sharing, as resources are allocated in real time. This means that trade-offs between service requirements can be done in real time as well (e.g. providing the guaranteed stream needed for voice vs. best effort data, including in times of high demand). Such trade-offs are not possible across separate systems. Ofcom should be mindful of the fact that this has been largely been driven by competition in the UK mobile sector, and also, without the need for intervention by Ofcom (i.e. without the need for a formal access regime).

EE also notes that spectrum auctions, trading and leasing has largely enabled more efficient use of available spectrum within the market and with a minimum of intervention by Ofcom. For example, Ofcom recently announced that it had received and approved applications from Qualcomm UK Spectrum Ltd., Hutchison 3G UK Limited and Vodafone Limited regarding a trade of frequencies held by Qualcomm in the 1452-1492 MHz band.² Furthermore, looking ahead EE expects that the planned release of further spectrum in the 2.3 GHz, 3.4 GHz and 700 MHz spectrum bands in the coming years is likely to lead to more efficient use of spectrum as the spectrum is potentially repurposed from technology applications that are currently using the spectrum to other applications that represent a more efficient use of the spectrum (i.e. higher value use).

In nearly all of these cases it is the market rather than regulatory intervention that is driving efficiency improvements in spectrum use. EE considers that where it is efficient to do so, and there is demand, the market will ensure that further efficient spectrum sharing can take place. Only where Ofcom is able to

² <http://stakeholders.ofcom.org.uk/consultations/mobile-trading-regs-apr-15/statement-trade-frequencies/>

demonstrate with clear evidence that the market is not facilitating efficient spectrum sharing should they consider any regulatory intervention.

4. The lack of evidence of demand for further efficient spectrum sharing

In the Consultation Ofcom has suggested that greater spectrum sharing may help to ensure efficient use of spectrum, and that the market may provide weak incentives for spectrum sharing (i.e. there may be barriers to sharing). Despite this Ofcom has provided no evidence in the Consultation that there is unmet demand for further spectrum sharing, and that meeting any potential unmet demand for spectrum sharing would lead to more efficient use of spectrum.

Instead, Ofcom implicitly assumes that there is strong demand for spectrum sharing. For example, Ofcom state that the framework includes “*tools and enablers that could have potential to facilitate or enable further sharing*”³, yet Ofcom has not provided evidence that there is demand for further sharing, or that there is likely to be a need for sharing in the future.

Furthermore Ofcom also appears to imply that further spectrum sharing by definition would lead to increased spectral efficiency. In the Consultation Ofcom states that “*There are limited incentives for sharing either in financial or regulatory terms*”⁴ and “*Some might argue that in the absence of an explicit regulatory requirement on licensees to look favourably on requests to share, comparatively low value sharing opportunities are unlikely to be considered*”.⁵ Whilst EE agrees that there may be limited financial incentives for spectrum sharing at present, EE considers this to be a market signal that “protected” spectrum (i.e. spectrum that is managed by a single operator) has a higher value use than shared spectrum. Regardless, EE notes that Ofcom needs to be clear that its duty is not to facilitate spectrum sharing per se but rather to promote efficient use of spectrum, and therefore it should only consider regulatory intervention where there is clear evidence there is unmet demand for efficient spectrum sharing and that regulatory intervention is required.

EE considers that in the highly competitive mobile sector, if there was demand for further spectrum sharing and that spectrum represented a higher net value use, then operators would clearly have an incentive to share spectrum (taking account of the risk of interference with the services it provides using the spectrum). This is clear from the example provided above, in relation to MVNOs, where despite being in direct competition with MVNOs at the retail level, MNOs still have an incentive to share their spectrum through a managed wholesale service. [3<].

³ Ofcom, The Consultation, Para 1.9

⁴ Ofcom, The Consultation, Page 15

⁵ Ofcom, The Consultation, Para 4.14

5. The need to undertake an assessment of the costs and benefits of efficient spectrum sharing

If Ofcom is able to establish, on the basis of robust evidence, that there is unmet demand for efficient spectrum sharing, then in order to balance its spectrum duties with its other statutory duties (e.g. to promote efficient investment and innovation) Ofcom would need to undertake an assessment of the costs, benefits and risks before considering taking forward any of the proposals in the Consultation. We set out below why we consider that the benefits of sharing mobile spectrum are at present, and in the foreseeable future, likely to be limited, as well as setting out some of the risks associated with implementing some of the interventionist tools that Ofcom has referred to in the Consultation.

5.1 Limited benefits of sharing mobile spectrum

EE considers that any assessment of the costs, benefits and risks of efficient spectrum sharing should be undertaken on a band by band basis, since some bands may be more suitable for spectrum sharing than others. For example, it may be technically feasible to manage efficient spectrum sharing [3<]. However, in contrast, MNO's [3<] require "clean" spectrum and greater flexibility around deployment in order to support mobility, service reliability and to promote innovation in a wide area of mobile access applications. MNOs are therefore likely to have a very high option value for spectrum, and sharing spectrum is likely to represent a lower value use of the spectrum (i.e. less efficient use of the spectrum).

5.2 Risks associated with regulatory intervention

EE considers that whilst Ofcom needs to first demonstrate that in the absence of regulatory intervention, there is likely to be unmet demand for efficient spectrum, as well as assessing the costs and benefits of spectrum sharing, we still wish to highlight some of the potential risks associated with the interventionist tools that Ofcom sets out in the Consultation. We set these risks out below, noting that this list should not be considered exhaustive.

First, in the Consultation Ofcom has suggested that there may be a need to place a regulatory requirement on spectrum licence holders to look "*favourably on requests to share*"⁶. Notwithstanding that Ofcom's statutory duties require Ofcom to ensure optimal use of spectrum, and therefore only look favourably on requests to share if there is clear evidence that this will facilitate more efficient use of spectrum, this statement increases the risks of investment in spectrum

⁶ Ofcom, The Consultation, Para 4.14

and in the network and services which it is used to deliver, in particular for mobile services.

EE along with other MNOs needs to be able to maintain commercial flexibility to deploy network assets over an optimal timeframe, taking into account business priorities and investment planning. Requirements to share mobile spectrum would significantly reduce flexibility to deploy network assets over an optimal timeframe, which in turn impairs our ability to deliver the highly valued mobile services we provide using that spectrum, as well as the ability to innovate in the way we use these spectrum assets. The threat of regulatory intervention is likely to increase the risks of investment in these services, which may for example delay the rollout of new services or new communications capabilities such as 5G in the UK.

Second, EE has concerns around Ofcom's suggestion in the Consultation that incentive auction and overlay auctions could be used for future spectrum releases to facilitate further spectrum sharing.⁷ Whilst further details on the design of such auctions would be needed in order to be able to comment in detail, any auction which requires the spectrum being auctioned to be shared could make spectrum unattractive for potential bidders that require "clean" spectrum. This would increase the risk of unsold spectrum, which would not only potentially result in inefficient use of spectrum, but could also exacerbate any potential shortages in scarce spectrum resources.

Third, in the Consultation Ofcom does not appear to have considered how it intends to monitor any sharing arrangements to ensure that, in the event that it mandated spectrum sharing, all users of the shared spectrum continue over time to use the spectrum in a way that did not interfere with the services of the users of the spectrum. For example, in the Consultation Ofcom suggests that Tiered access, which would involve a hierarchy of rights for different categories of user in a given frequency band, could be used to facilitate greater sharing. However whilst Ofcom has recognised that there are initial challenges in balancing the impact on the incumbent and the usage constraints on any additional user, there is also a risk that in the absence of an effective monitoring and enforcement system, users of shared spectrum may over time have limited incentive to ensure compliance with the conditions of the tiered sharing arrangement. In the event that Ofcom imposed or permitted a tiering arrangement, EE considers that Ofcom needs to consider how it would monitor and enforce the adherence over time to the rights within the tiering arrangement and the costs associated with this.

Relatedly, EE also notes that Ofcom's monitoring, compliance and enforcement team already faces significant challenges and demands on resources in fulfilling its duty to respond to reports by spectrum holders of harmful interference affecting frequencies used for their networks. Ofcom needs to consider the added burden that may be placed on this team when considering the costs and benefits of Tiered access or other spectrum sharing arrangements.

⁷ Ofcom, The Consultation, Para 5.19

Finally, in the Consultation Ofcom has suggested that more information on spectrum use could be made available to facilitate greater spectrum sharing.⁸ Whilst EE would require more detail on the specific information that Ofcom is referring to, it is clear from the examples that Ofcom does provide, that at least some of the information is likely to be commercially sensitive and therefore highly confidential (Ofcom has to some extent recognised this in the Consultation⁹). Furthermore Ofcom needs to be mindful of the fact that some of the information it believes may be useful, will either not be available (e.g. it may not be information that is currently captured) or it may be very onerous to obtain. Ofcom needs to ensure that it consults with stakeholders on any detailed information requirements to ensure that the requirements are feasible and proportionate.

⁸ Ofcom, The Consultation, Para 5.4-5.8

⁹ Ofcom, The Consultation, Para 5.8