Title:	Impact Assessment (IA)
Impact Assessment for a Direction to the Office for Communications (Ofcom) to intervene in spectrum management	**IA No:** BIS0118
	Date: 13/07/2010
	Stage: Final
Lead department or agency:	**Source of intervention:** Domestic
Department for Business, Innovation and Skills (BIS)	**Type of measure:** Statutory Instrument
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Ofcom	

Summary: Intervention and Options

What is the problem under consideration? Why is government intervention necessary?

The UK Government has been considering possible solutions to the complex set of challenges hindering the release and use of additional spectrum that could support the deployment of next generation mobile broadband and ensure that the UK mobile sector remains highly competitive. These challenges have centred around the change in use of 2G spectrum to deliver 3G mobile services.

Government intervention through a Direction to the regulatory body, Ofcom, is deemed necessary to avoid further delay. Acting now will help accelerate the process of releasing existing and new spectrum, and thereby progress towards universal coverage in 3G and next generation mobile services and the transition to next generation high speed broadband services.

Depending on how the market for 3G and next generation mobile and mobile broadband services develop in the future, should the level of competition become weaker as a result of the way in which spectrum is held by mobile operators, further intervention at a later date may be appropriate.

What are the policy objectives and the intended effects?

The UK Government will direct Ofcom to take specific actions with the objective of facilitating the release, liberalisation and more efficient use of existing and newly awarded spectrum in a number of bands, including sub 1GHz spectrum. This Direction will include adoption of the EU GSM Directive and Radio Spectrum decision which require EU Member States to allow 900MHz and 1800MHz spectrum bands respectively to be used to deliver 3G services as well as 2G.

By laying this Direction, the UK Government aims to bring forward the benefits to businesses and consumers associated with universal coverage in 3G and next generation mobile services and the transition to next generation high-speed broadband services. It should also serve to ensure that the degree of competition, and similarly investment, is safeguarded, particularly following the merger of T-Mobile and Orange on 1st March 2010.

What policy options have been considered? Please justify preferred option (further details in Evidence Base)

The following options have been considered by Government:

Option 0: Do nothing - Ofcom left to address the issues through the normal regulatory process

Option 1: Lay a Direction to Ofcom specifying particular interventions on spectrum management

Following the recent consultation and further discussions with Ofcom, the Government has decided to take forward Option 1 which means that Ofcom will be directed to take actions now which may otherwise continue to be delayed

When will the policy be reviewed to establish its impact and the extent to which the policy objectives have been achieved?	It will be reviewed 2013-2015
Are there arrangements in place that will allow a systematic collection of monitoring information for future policy review?	Yes

Ministerial Sign-off For final stage Impact Assessments:

I have read the Impact Assessment and I am satisfied that (a) it represents a fair and reasonable view of the expected costs, benefits and impact of the policy, and (b) the benefits justify the costs.

Signed by the responsible Minister: ..... Date: .....

Summary: Analysis and Evidence

Policy Option 1

Description:

Price Base Year 2010	PV Base Year 2010	Time Period Years 10	Net Benefit (Present Value (PV)) (£m)		
			Low: Optional	**High:** Optional	**Best Estimate:** Net positive

COSTS (£m)	Total Transition (Constant Price)	Years	Average Annual (excl. Transition) (Constant Price)	Total Cost (Present Value)
Low	Not quantified		Not quantified	**Not quantified**
High	Not quantified		Not quantified	**Not quantified**
Best Estimate	0		0	**0**

Description and scale of key monetised costs by 'main affected groups'

As there is a high degree of overlap between Options 0 and 1, with the main difference between the two options concerning the timing of the action, the marginal costs of Option 1 are minimal. This is not counted as a cost because it is part of Ofcom's existing portfolio.

Other key non-monetised costs by 'main affected groups'

BENEFITS (£m)	Total Transition (Constant Price)	Years	Average Annual (excl. Transition) (Constant Price)	Total Benefit (Present Value)
Low	Not quantified		Not quantified	**Not quantified**
High	Not quantified		Not quantified	**Not quantified**
Best Estimate	**Not quantified**		**Not quantified**	**Not quantified**

Description and scale of key monetised benefits by 'main affected groups'

There is a high degree of overlap between Option 0 and 1, with the main difference between the two options concerning the timing of the action. Under Option 1 the timing of additional benefits would be brought forward since a solution would be implemented relatively sooner. This will represent a transitional benefit lasting the period of time between the action being undertaken following Direction and the action being undertaken had Ofcom followed the normal regulatory process.

Other key non-monetised benefits by 'main affected groups'

One-off benefits to businesses and consumers stemming from rapid transition to next generation mobile and mobile broadband, progress towards universal coverage in 3G and next generation mobile and safeguarding competition in the UK mobile sector.

Key assumptions/sensitivities/risks **Discount rate (%)** 3.5

BIS used Ofcom modelling where appropriate to make a qualitative assessment of the costs and benefits associated with the revised Direction. The limitations of this approach are set out in the evidence base.

Ofcom will carry out an assessment of the 3G and next generation market ahead of the upcoming auction of 800MHz and 2.6GHz so that any potential competition concerns can be addressed in the auction's design.

Impact on admin burden (AB) (£m):			Impact on policy cost savings (£m):	In scope
New AB: N/A	**AB savings:** N/A	**Net:** N/A	**Policy cost savings:**	N/A

Enforcement, Implementation and Wider Impacts

What is the geographic coverage of the policy/option?			United Kingdom		
From what date will the policy be implemented?			September 2010		
Which organisation(s) will enforce the policy?			Ofcom		
What is the annual change in enforcement cost (£m)?			N/K		
Does enforcement comply with Hampton principles?			Yes		
Does implementation go beyond minimum EU requirements?			No		
What is the CO_2 equivalent change in greenhouse gas emissions? (Million tonnes CO_2 equivalent)			**Traded:** N/A	**Non-traded:** N/A	
Does the proposal have an impact on competition?			Yes		
What proportion (%) of Total PV costs/benefits is directly attributable to primary legislation, if applicable?			**Costs:** N/A	**Benefits:** N/A	
Annual cost (£m) per organisation (excl. Transition) (Constant Price)	**Micro** £0m	**< 20** £0m	**Small** £0m	**Medium** £0m	**Large** £0m
Are any of these organisations exempt?	N/A	N/A	N/A	N/A	N/A

Specific Impact Tests: Checklist

Set out in the table below where information on any SITs undertaken as part of the analysis of the policy options can be found in the evidence base. For guidance on how to complete each test, double-click on the link for the guidance provided by the relevant department.

Please note this checklist is not intended to list each and every statutory consideration that departments should take into account when deciding which policy option to follow. It is the responsibility of departments to make sure that their duties are complied with.

Does your policy option/proposal have an impact on…?	**Impact**	**Page ref within IA**
Statutory equality duties[1] Statutory Equality Duties Impact Test guidance	Yes	13
Economic impacts		
Competition Competition Assessment Impact Test guidance	Yes	9
Small firms Small Firms Impact Test guidance	Yes	13
Environmental impacts		
Greenhouse gas assessment Greenhouse Gas Assessment Impact Test guidance	No	13
Wider environmental issues Wider Environmental Issues Impact Test guidance	Yes	13
Social impacts		
Health and well-being Health and Well-being Impact Test guidance	No	13
Human rights Human Rights Impact Test guidance	No	13
Justice system Justice Impact Test guidance	No	13
Rural proofing Rural Proofing Impact Test guidance	Yes	13
Sustainable development Sustainable Development Impact Test guidance	No	13

[1] Race, disability and gender Impact assessments are statutory requirements for relevant policies. Equality statutory requirements will be expanded 2011, once the Equality Bill comes into force. Statutory equality duties part of the Equality Bill apply to GB only. The Toolkit provides advice on statutory equality duties for public authorities with a remit in Northern Ireland.

Evidence Base

References

The following impact assessment builds on the issues set out in the impact assessment which accompanied the Digital Britain Report (June 2009), the Digital Economy Bill (November 2009, revised March 2010) and the consultation on spectrum modernisation (October 2009). Weblinks to the relevant documents are set out below.

No.	Legislation or publication
1	Digital Britain Final Report Impact Assessments (June 2009) http://webarchive.nationalarchives.gov.uk/+/http://www.culture.gov.uk/images/publications/digitalbritain_impactassessment.pdf
2	A Consultation on a Direction to Ofcom to implement the Wireless Radio Spectrum Modernisation Programme (October 2009) http://www.bis.gov.uk/files/file53061.pdf
3	Digital Economy Bill Impact Assessment (November 2009) http://interactive.bis.gov.uk/digitalbritain/wp-content/uploads/2009/11/DEB-Impact-Assessments.pdf
4	Digital Economy Bill Impact Assessment, 2nd Edition (March 2010) http://www.bis.gov.uk/assets/biscore/corporate/docs/d/10-810-digital-economy-bill-impact-assessments

Rationale for Government Intervention

Over the last eighteen months, the UK Government has been considering possible solutions to the complex set of challenges hindering the release and use of additional spectrum that could support the deployment of next generation mobile broadband and ensure that the UK mobile sector remains highly competitive. These challenges have centred around changing the use of 2G spectrum to deliver 3G mobile services (referred to in the industry as '*2G refarming*').

Government action through a Direction to the regulatory body, Ofcom, is deemed necessary to avoid further delay. Appropriate intervention now will accelerate the process of releasing existing and new spectrum, and thereby progress towards universal coverage in 3G and next generation mobile services and the transition to next generation high-speed broadband services. It would also serve to help safeguard competition in the UK mobile sector.

Without government intervention, more time could elapse before an appropriate solution is agreed and implemented. As a result, the benefits to businesses and consumers of a modern effective wireless communications infrastructure would be delayed even further. These benefits would include efficiency gains, increased innovation and investment in mobile networks and services, including mobile broadband, and greater consumer choice.

Depending on how the market for 3G and next generation mobile and mobile broadband services develop in the future, should the level of competition become weaker as a result of the way in which spectrum is held by mobile operators, further intervention at a later date may be appropriate.

No alternatives to regulation are possible because of the nature of bandwidth provision. Bandwidth provision requires a statutory duty by OFCOM to provide auctions for spectrum allocation to the mobile services sector to bid and secure access.

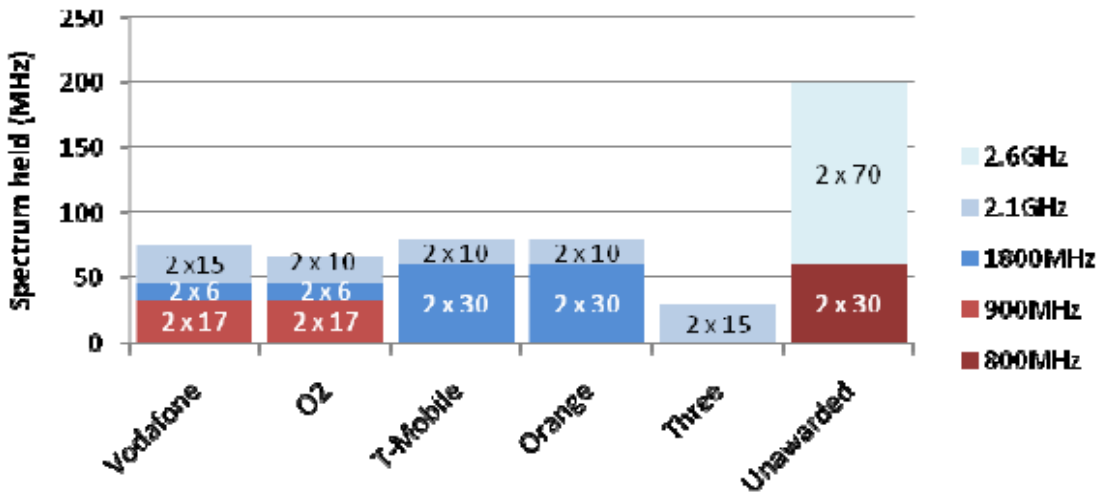
Current spectrum holdings in the UK mobile sector

Until 2000, the UK adopted a command and control approach to spectrum management. This involved the UK Government, or one of its appointed bodies, making decisions on who could use certain bands of spectrum and what it could be used for.

In 1983, the UK Government allocated second generation (2G) mobile spectrum at 900MHz to Vodafone and O2. In 1991, it allocated the majority of 2G mobile spectrum at 1800MHz to T-Mobile and Orange with the rest distributed between Vodafone and O2.

Since 2000, the UK Government has switched to a more market-based approach to spectrum management with three pillars: spectrum liberalisation; spectrum pricing; and spectrum trading. In 2000, the UK Government auctioned third generation (3G) licences at 2.1GHz. This band of spectrum is relatively evenly divided across three mobile network operators (MNOs) – Vodafone, O2, T-Mobile and Orange (Everything Everywhere) – and 3UK which does not have any holdings of 900MHz or 1800MHz. The spectrum held by the main mobile companies in the UK is illustrated in Figure 1 below.

Figure 1: Distribution of paired spectrum across the five main MNOs[2]



Source: Independent Spectrum Broker's initial report, May 2009

Note: 2x15 implies two blocks of 15MHz spectrum

Options

[2] The chart has been reproduced from Independent Spectrum Broker's Interim Report to Government, May 2009 at http://www.culture.gov.uk/images/publications/ISB_final_report.pdf

The Government has been considering two options. These are:

Option 0: Do nothing – Ofcom left to address the issues through the normal regulatory process

Option 1: Lay a Direction to Ofcom

Option 0: Do nothing - Ofcom left to address issues around 2G refarming

Under this option, the Government would leave it to Ofcom to address these issues through the normal regulatory process. Even in the absence of a Direction, Ofcom would still take action on a number of wide ranging issues relating to spectrum management.

For example, it would still be required to liberalise 900MHz under the EU GSM Directive and the 1800MHz in accordance with the draft Radio Spectrum Committee decision. Liberalisation means that specific technology and usage restrictions will be relaxed to allow mobile network operators to use these spectrum bands to deliver 3G services as well as 2G. At the same time, Ofcom would make these licences indefinite and tradable. It would also set revised licence fees to reflect the full economic value.

The regulator would also have to make decisions regarding:

1. The award of 2.6GHz spectrum
2. The award of the 800MHz spectrum
3. Whether to impose access and/or coverage obligations
4. What rules (including possible spectrum caps) would form part of any future auction design

Option 1: Lay a Direction to Ofcom

Under this option, Ofcom would still take many of the actions described in Option 0 above. These include:

- Liberalisation of 900MHz and 1800MHz spectrum in the hands of the incumbent operators so that it can be used to deliver 3G services as well as 2G services
- Making 2G and 3G spectrum licences indefinite and tradable
- Revising annual licence fees to reflect the full market value of the relevant spectrum
- Proceeding with the auction of 800MHz and 2.6GHz spectrum

The main difference between Option 0 and 1 relates to timing. Under Option 0, Ofcom would have to decide how to best to implement the above EC legislation. Given the large number of issues which Ofcom would need to consider, and the widely differing views of various stakeholders, this could entail further consultation and could result in a further delay of between six to nine months before action is taken.

Under Option 1, specific action on these issues would be taken earlier. This would enable the potential benefits to businesses and consumers associated with universal coverage in 3G and next generation mobile services and the transition to next generation high-speed broadband services to be brought forward.

In contrast to previous solutions considered by the UK Government, at the present time, Ofcom would not be directed to introduce quantitative restrictions on holdings of particular frequencies (so-called 'spectrum caps') or impose wholesale or coverage obligations on different spectrum bands,

Prior to the auction of 800MHz and 2.6GHz spectrum, Ofcom will also be required to assess how the market for 3G and next generation mobile and mobile broadband services in the UK is likely to evolve in the next few years. It is intended that the findings of their market assessment will inform the auction's design, with a view to addressing any identified risks of potential competition distortion.

Cost-Benefit Analysis of Options

Methodology, Limitation, Assumptions

Modelling the economic value achievable from the liberalisation and release of existing and new spectrum is a highly technical and resource intensive exercise. The models developed by Ofcom to inform their policy proposals consider a number of different possible scenarios and are underpinned by a number of wide-ranging economic and technological

assumptions including the amount of spectrum released, the number of potential competitors, future demand for communication and media services, including mobile broadband, and the timing of spectrum release.

There are many significant unknowns. These include the precise timing of any auctions under both the baseline and following a Direction, as well as the value of UK spectrum, which means the estimation of a reliable quantification of the potential benefits and costs of bringing forward these specific actions on spectrum management is not possible.

Ofcom has carried out considerable analysis on the economic benefits and costs of applying spectrum liberalisation and trading to the UK mobile sector[3]. Where appropriate, we have used the results of their modelling work, (developed for the purpose of informing their policy proposals), to make a qualitative assessment of the costs and benefits associated with the proposed Direction.

The costs and benefits associated with the release and liberalisation of the relevant bands of spectrum – namely 900MHz and 1800MHz – have been assessed individually. For completeness, we have considered the costs and benefits associated with 2.1GHz licences and the combined auction of 800MHz and 2.6GHz.

The disadvantage of considering these proposals on an individual basis is that it does not provide a true assessment of the expected economic value of the proposed Direction as a whole, as this is not possible. Therefore, this approach is an imperfect assessment and as such the estimates of costs and benefits outlined in this Impact Assessment are intended solely for illustrative purposes.

Cost - Benefit Analysis for 900 MHz and 1800MHz

In accordance with the revised EU GSM Directive and the draft Radio Spectrum Committee decision, 900MHz and 1800MHz spectrum bands would be liberalised in the hands of existing holders. Licences would be made tradable and indefinite and annual licence fees would be revised to reflect the full market value of these spectrum bands.

Considerable work has been done on the economic benefits of a market-based approach to spectrum management including liberalisation and secondary trading. A useful review of the economic literature can be found in a report by Analysys Mason for the European

[3] The weblink to the reports are attached here: http://www.ofcom.org.uk/consult/condocs/800mhz; http://www.ofcom.org.uk/consult/condocs/spectrumlib/; http://www.org.uk/consult/condocs/2ghzrules/statementim/statement/statement.pdf. It should be noted that the circumstances have changed materially since these documents were published. It should not therefore be assumed that the preferred options set out therein would be in the options that Ofcom would pursue if the Government did not intervene. Moreover, Ofcom's proposals for the 2.6GHz level of spectrum have been withdrawn in light of the publication of the Digital Britain Report.

Commission in 2004[4] and a paper by Xavier and Ypsilanti (2006)[5]. In summary, some of the main high-level benefits of spectrum liberalisation and trading include:

- Increased investment and innovation in new technologies and services arising from more efficient use of spectrum
- Efficiency gains arising from greater usage of lower frequencies which enable mobile operators to reduce the number of masts they need to relay services.
- Increased competition between existing and new technologies and users of spectrum brought about by the reduction in restrictions on access and use of spectrum
- Greater consumer choice with users gaining access to a wider range of mobile operators and new more innovative mobile services including mobile broadband at lower cost
- Consumer benefits in the form of faster and better quality mobile services including mobile broadband and improved geographical coverage, particularly in more rural areas
- Greater social inclusion of people and communities in more remote regions
- Increased GDP growth arising from increased competition for spectrum brought about by the removal of restrictions on access to spectrum and greater competitiveness in the mobile sector
- Increased transparency raising awareness of the true value of spectrum and market entry opportunities, and reducing barriers to entry

Relatively few studies have attempted to actually estimate the potential economic value associated with spectrum. Work by Europe Economics estimated that the economic value generated by spectrum applications in the UK could be in the order of £42bn in 2006 of which nearly £38bn was consumer benefits[6].

Economic modelling work by Ofcom suggests that liberalisation of 900MHz could deliver some resource cost savings to mobile operators. These savings arise because lower frequencies such as 900MHz are good for achieving wider coverage, requiring fewer base

[4] Analysys Mason (2004) Study on conditions and options in introducing secondary trading of radio spectrum in the European Community.
http://ec.europa.eu/information_society/policy/ecomm/radio_spectrum/_document_storage/studies/secondary_trading/secontrad_final.pdf

[5] Xavier, P. and Ypsilanti, D. (2006) *Policy issues in spectrum trading*. This paper can be found at *http://www.emeraldinsight.com/journals.htm?articleid=1546218&show=abstract*

[6] Europe Economics (2006) *Estimating the economic value of radio spectrum in the UK*
http://stakeholders.ofcom.org.uk/binaries/research/spectrum-research/economic_impact.pdf

stations to cover a particular area. The size of the resource cost savings achieve will be influenced by the degree of access non-holders of 900MHz have to this spectrum[7]. If access continues to be limited then the potential cost savings achievable is reduced since non-holders of 900MHz will have to use other spectrum bands to enhance their networks which will be relatively more costly.

It is possible that there may be some resource cost savings associated with the liberalisation of 1800MHz. However, Ofcom suggest that these may be much smaller as these bands of spectrum do not share the same propagation properties as 900MHz.

The resource cost savings achieved from the liberalisation of 900MHz and 1800Mhz may be passed onto consumers in the form of lower prices or improvements in the speed, quality and geographical coverage of 2G and 3G networks. The potential implications for competition are considered in a later section.

Cost - Benefit Analysis for 2.1GHz

As part of the Direction, Ofcom would be required to make 2.1GHz licences indefinite and tradable. This could bring about similar economic benefits to those described above (e.g. enhancements in 3G networks, and increased innovation and investment in mobile services including mobile broadband). These benefits would arise because this band of spectrum enables mobile operators to deliver services which require greater bandwidth capacity.

Cost - Benefit analysis for 800 MHz and 2.6 GHz

The advantage of a combined auction is that is will make appropriate decision making easier for those companies wishing to acquire spectrum in bands, and at levels that would support the roll-out of new services. We would expect the economic benefits achievable from auctioning these two bands of spectrum jointly should be higher than individual awards since mobile network operators will be able to bid for the quantity and mix of low and high frequency spectrum that they need. The Government anticipates the auction occurring 9 to 12 months after laying the Direction.

The 800 MHz spectrum

[7] Economic modelling work carried out by Ofcom as part of its 2007 consultation on liberalising 900MHz and 1800MHz suggested cost savings in the region of hundreds of millions of pounds based on specific technology and demand assumptions. See Ofcom (2007) *Application of spectrum liberalisation and* trading to the mobile sector. Consultation document http://stakeholders.ofcom.org.uk/binaries/consultations/liberalisation/liberalisation.pdf

Ofcom's statement in July 2009 on releasing 800MHz confirmed its preferred option to include cleared channels 61, 62 and 69 in the award of the digital dividend (represented by channels 63 to 68 inclusive).

The results of modelling work by Ofcom – reproduced in Table 2 below – suggests that the total gross economic value achievable from the release of 800MHz under different demand scenarios could range from £4.1bn to £7.5bn under different demand scenarios. The costs of clearing channels 61, 62 and 69 would range from some £115m to £250m.

Table 2: Total benefits of liberalising all of 800MHz[8]

	Scenario 1[9]	Scenario 2[10]	Scenario 3[11]
Clearing Channels 61-69 inclusive			
Economic value of DTT	2,000	2,000	3,100
Economic value of Mobile Broadband	4,400	4,400	1,300
Economic value of MMS	0	1,400	0
Less costs of clearing channels 61, 62 & 69	*-115*	*-250*	*-250*
Total economic value (£m)	**6,300**	**7,500**	**4,100**

Source: Ofcom (2009) Digital Dividend: Clearing the 800MHz band. Statement

The 2.6 GHz spectrum

Ofcom withdrew their previous proposals on 2.6GHz in 2008 as a result of legal challenges from mobile network operators. Further developments including the publication of the Digital Britain Report by the previous Government which proposed an alternative regulatory solution is one of the main reasons why Ofcom has not brought forward revised proposals.

An imperfect proxy of the economic value which spectrum users place on different frequencies is the amount of money they are to bid for spectrum rights in an auction. To date, a small number of auctions of 800MHz and 2.6GHz have been carried out. For example, a recently concluded auction in Germany raised some €4.4bn (around £3.7bn)[12] for frequencies including 800MHz and 2.6GHz (along with some other spectrum). Further evidence on the revenues raised through spectrum auctions can be found at http://kbspectrum.com/blog/?page_id=348.

[8] Ofcom (2009), Digital Dividend: Clearing the 800MHz Band, Statement, 2009. http://stakeholders.ofcom.org.uk/binaries/consultations/800mhz/statement/clearing.pdf

[9] Scenario 1: Strong demand for mobile communication: strong consumer demand for mobile communications and weak demand for other services

[10] Scenario 2: Strong demand for all services: strong demand for the spectrum for all mobile communications, DTT and MMS.

[11] Scenario 3: Strong demand for DTT: strong demand for DTT and relatively weak demand for mobile communications and MMS. (This scenario was used to stress-test the analysis and was not considered especially likely.)

[12] Exchange rate from Financial Times (21st July 2010) of €1=£0.85

One in, One Out

For the One In, One Out Rule, a One Out measure does not need to be sought for this measure as there are no total costs.

Competition Assessment

Structure of the market

In recent months, there has been further consolidation in the UK mobile sector. On 1st March 2010, the European Commission approved the joint venture between T-Mobile and Orange, reducing the number of mobile network operators (MNOs) in the sector from five to four. These are Everything Everywhere (the new name for T-Mobile and Orange), Vodafone, O2 and Hutchison 3G (hereafter 3UK).

Three of the four MNOs – Vodafone, O2 and Everything Everywhere – are able to provide both 2G and 3G mobile telephony services. The fourth MNO, 3UK, is a pure 3G network but in areas in the UK not covered by its own 3G network, it has a national roaming agreement with Everything Everywhere to use its 2G network[13].

On the basis of subscriptions over the first half of 2009, the four main network operators together account for around 80-90% of the retail market. Everything Everywhere would have the largest share of the retail market, followed by O2, Vodafone and then 3UK (see Table 3 below). The Mobile Virtual Network Operators[14] (MVNOs), of which there are around 25, account for the remaining 10-20%.

Table 3: UK retail market share: First half of 2009[15]

[13] Prior to the joint venture, this network sharing agreement was with Orange. Continuation of this arrangement was a condition attached to European Commission's decision to approval the joint venture.

[14] Mobile Virtual Network Operators (MVNOs) are companies which are able to provide mobile phone services but do not have their own network or hold any spectrum. They offer mobile services by using the networks of the main national mobile companies. MVNOs include Virgin Mobile, Tesco Mobile and BT Mobile. For more information see Ofcom (2009) *Mostly Mobile.* Ofcom mobile sector assessment. http://stakeholders.ofcom.org.uk/binaries/consultations/msa/summary/msa.pdf

[15] OFT submission on proposed merger: http://www.oft.gov.uk/shared_oft/mergers_ea02/2010/Orange-T-Mobile-article-9.pdf

Operator/Service providers	Market share (% of subscribers)
Everything Everywhere	30-35
O2	25-30
Vodafone	25-30
3UK	5-10
Virgin Media (MVNO)	0-5
Tesco Mobile (MVNO)	0-5
BT Mobile (MVNO)	0-5
Lycamobile (MVNO)	0-5
Lebara Mobile (MVNO)	0-5
Other MVNOs	0-5
TOTAL	**100%**

Source: OFT submission on proposed merger

Characteristics of the market

The UK mobile sector is regarded as competitive relative to other countries. Evidence presented in Ofcom's second market assessment of the mobile sector shows that the degree of competition in the sector has increased since 3UK entered the market in 2003[16].

One of the factors which can have an important influence on competition in the sector is the availability of spectrum. Mobile network operators (MNOs) ideally need a mixture of low and high speed spectrum frequencies in order to deliver next generation mobile (NGM) services. Lower frequencies such as 800MHz and 900MHz are good for achieving wider coverage, requiring fewer base stations to cover a particular area and delivering in-building penetration while higher frequencies such as 2100MHz and 2600MHz are necessary for providing capacity for large number of end-users in dense (urban) areas. Difficulties acquiring the quantity or mix of relevant spectrum needed to deliver high quality mobile phone and broadband services across larger areas can therefore act as a significant barrier to entry.

[16] Ofcom (2009) Mostly Mobile. Second mobile sector assessment. Consultation Document: http://stakeholders.ofcom.org.uk/binaries/consultations/msa/summary/msa.pdf

For all operators, spectrum below 1GHz is particularly valuable because lower frequencies enable mobile phone signals to cover longer distances and penetrate buildings more effectively than higher frequencies. As a result, operators who hold sub 1GHz may have a significant cost advantage over those which do not.

Competition effects associated with liberalising 900MHz

Ofcom's consultation in February 2009 reported the potential risks to competition of liberalising the 900MHz spectrum in the hands of the incumbent operators, Vodafone and O2. In brief, they argued that Vodafone and O2 would be able to offer a higher quality mobile broadband service with better in-building penetration and greater network coverage than its competitors.

This would stem from the significant advantages of holding low frequency spectrum such as 900MHz over higher frequency spectrum such as 2100MHz. First, network at 900MHz would require 50% fewer base station sites than at 2100MHz implying that Vodafone and O2 would have a significant cost advantage over its competitors when extending network coverage in more rural areas. Second, 900MHz spectrum would also enable Vodafone and O2 to provide better in-building coverage for mobile broadband services.

The consultation concluded that liberalising 900MHz in the hands of the incumbents could weaken competition in the sector for around two to four years until the other incumbent operators could roll out a competitive service using a network at 800MHz. During this period, consumers could face higher prices or receive poorer quality mobile broadband services than would otherwise have been the case.

Since the consultation was published, there have been a number of further developments in the UK mobile sector which together may reduce competition concerns. First, demand for mobile broadband services has continued to grow. Second, there is greater certainty that 800MHz, once released, will be used to support mobile broadband services. Third, there has been further progress on Long Term Evolution mobile services (LTE),[17] to the extent that LTE deployment in the 800MHz would represent a more credible competitive alternative to 3G services in the 900MHz. Fourth, the increasing deploying of femtocells – low cost, low power 2G/3G mobile base stations for indoor residential and business use – may help reduce some of the differences in indoor quality and capacity between 900MHz and 2100MHz networks

The final, and most significant development, has been the merger of T-Mobile and Orange, creating the new commercial entity Everything Everywhere. Through this merger, these two

[17] Long Term Evolution (LTE) is a next generation wireless broadband technology considered by the mobile industry to be a successor to current 3G technology.

operators now have access to a greater number of sites than they did previously. This should help reduce the competitive advantage that Vodafone and O2 could have deploying 3G services through a network at 900MHz. Competition intensity may be further enhanced by 3UK which, as a result of the merger, should also have access to many of these sites.

Competition effects associated with liberalising 1800MHz

In the same way as 900MHz, the proposed liberalisation of 1800MHz in the hands of incumbents has also raised potential competition concerns. These arise because the newly formed joint venture, Everything Everywhere, holds the majority of 1800MHz which it could use to gain an advantage in the deployment of LTE services as take-up increases.

It is not, however, envisaged that liberalisation of 1800MHz in the hands of the incumbents should distort competition. First, 1800MHz is similar to 2100MHz spectrum for providing 3G coverage. Second, with respect to 3G capacity, operators appear able to obtain sufficient capacity by using other spectrum bands or deploying new sites or technologies to meet likely demand. Finally, the divestment by Everything Everywhere of 2x15MHz of 1800MHz to one of the other operators should help reduce any potential advantage, thereby mitigating the risk of competition being distorted.

Competition effects associated with making 2G and 3G licences indefinite

The overall impact on competition of making all 2G and 3G licences indefinite, including 800MHz and 2.6GHz, is unclear. If licences are made indefinite, this may encourage further investment by mobile network operators in their networks, especially 3UK which it is claimed would exit in the market if this did not happen. Under such circumstances, making licences indefinite could serve to safeguard competition by ensuring that there continues to be four players in the market rather than three.

There is however, a risk that competition could be dampened. This is because, in the absence of any definite licence expiry date, mobile operators would be able to hold onto their current holdings of spectrum for as long as they wish to, preventing other incumbent operators, as well new entrants from acquiring the spectrum they need to enter the sector or expand and provide effective competition.

There are two principal reasons why operators may hold onto their spectrum, even if they are not using it. Firstly, they may wish to have it in reserve in case new technologies and uses emerge which increase the value of spectrum, or there is greater certainty about consumer demand for new emerging services. Secondly, they may wish to hold onto it to

deliberately prevent competition from incumbent operators or new entrants. Spectrum is a limited resource and by limiting its availability, hoarding operators can prevent incumbent and new entrants acquiring the quantity and mix of spectrum that they need to compete effectively[18].

The risk to competition of making licences indefinite may be mitigated if there is a high level of secondary trading activity. This will be influenced by a number of factors. These include the amount of information which operators have about the value of different spectrum bands, the extent to which operators choose to hoard spectrum, the size of transaction costs relative to the value of spectrum being exchanged and sold, and the degree to which the value of different spectrum changes over time as a result of ongoing innovation in mobile technologies and services including mobile broadband. The application from 2021 of annual licences charges, known as administrative incentive pricing (AIP), should also serve to reduce the incentive to hold idle spectrum.

Secondary trading of spectrum is still very much in its infancy with markets established in only a small handful of countries to date, most notably the USA, Australia and New Zealand. Early evidence from Australia and New Zealand suggests that the level of activity in spectrum trading has been relatively modest, a finding which can be explained in part by the fact that the markets are still not well developed. Evidence from Australia also shows that the majority of trading has involved spectrum bands below 3.5GHz, reflecting the high value that spectrum users place on lower band frequencies[19].

As noted in this impact assessment, prior to the auction of 800MHz and 2.6GHz spectrum, Ofcom will also be required to assess how the market for 3G and next generation mobile and mobile broadband services in the UK is likely to evolve in the next few years. It is intended that the findings of their market assessment will inform the auction's design, with a view to addressing any identified risks of potential competition distortion.

Moreover, depending on how the UK mobile sector develops in the future, should the level of competition become weaker as a result of the way in which spectrum is held by mobile operators, further intervention at a later date may become appropriate.

Other economic considerations

As noted above, in contrast to previously proposed solutions, the current Direction does not include proposals to introduce quantitative restrictions on holdings of sub 1GHz spectrum

[18] Xavier, P. and Ypsilanti, D. (2006) *Policy issues in spectrum trading*.
[19] Xavier and Ypsilanti (2006).

(so-called spectrum caps) or impose wholesale or coverage obligations on the different spectrum bands. The potential economic effects including on competition in the longer-term are unclear.

For example, the absence of spectrum caps could serve to distort competition because certain bands of spectrum remains concentrated in the hands of just one or two operators providing them with a potential cost or technical advantage over their competitors.

With regards 800MHz, allowing all operators to bid freely for the newly released spectrum may serve to increase competition for new spectrum. However, there is a risk that 3UK could get squeezed out for new sub 1GHz spectrum. This may hamper its ability to invest in new network and could restrict further expansion in the market; it is even possible that 3UK exits the sector altogether. This would weaken competition by reducing the number of players in the sector.

In the absence of wholesale obligations, there may be less competitive pressure on downstream markets. Further in the absence of coverage conditions, the Government may make less, or slower, progress towards extending super-fast mobile broadband services across the UK. This would raise equity concerns in some areas – particularly the more rural and remote regions of the UK.

Prior to the auction of 800Mhz and 2.6GHz taking place Ofcom will be required to assess how the market for 3G and next generation mobile and mobile broadband services in the UK is likely to evolve in the next few years. It is intended that the findings of Ofcom's assessment of 3G and next generation mobile services will help inform the auction's design with a view to mitigating any identified risks of potential competition distortion.

Other specific tests

Other environment/ rural proofing

It is possible that the Direction may have a positive impact on the environment. If more operators are able to acquire and use lower frequencies to deliver next generation mobile services and mobile broadband, fewer masts may be needed reducing the detrimental effect masts may have on the aesthetic value of the landscape. This Direction may also help improve the coverage of 3G mobile and mobile broadband networks in more rural areas.

Race, disability and gender equality

After an initial screening it has been deemed that no significant impact is anticipated on the statutory impact tests for race, disability and gender equality.

Small Firms Test

The Direction will mainly affect the main national mobile operators – Everything Everywhere, Vodafone, O2 and 3UK. Small firms may benefit if the Direction leads to 3G mobile and mobile broadband networks and services which are of better quality and offer greater coverage.

Other tests

Other specific impact tests have been considered including the Justice System, Human Rights, Legal Aid, Health and Well-Being, Rural Proofing, Sustainable Development, Carbon Assessment and Greenhouse Gas Assessment. Again, after initial screening, it has been deemed that no significant impact is anticipated.

Post Implementation Review (PIR) Plan

A PIR should be undertaken, usually three to five years after implementation of the policy, but exceptionally a longer period may be more appropriate. A PIR should examine the extent to which the implemented regulations have achieved their objectives, assess their costs and benefits and identify whether they are having any unintended consequences. Please set out the PIR Plan as detailed below. If there is no plan to do a PIR please provide reasons below.

Basis of the review: [The basis of the review could be statutory (forming part of the legislation), it could be to review existing policy or there could be a political commitment to review];

Under the Digital Economy Act, Ofcom now has a duty to produce a report every three years on the UK communications infrastructure.

Prior to the auction of 800Mhz and 2.6GHz taking place Ofcom will be required to assess how the market for 3G and next generation mobile and mobile broadband services in the UK is likely to evolve in the next few years.

Review objective: [Is it intended as a proportionate check that regulation is operating as expected to tackle the problem of concern?; or as a wider exploration of the policy approach taken?; or as a link from policy objective to outcome?]

It is intended that the findings of Ofcom's assessment of 3G and next generation mobile services will help inform the auction's design with a view to mitigating any identified risks of potential competition distortion.

Review approach and rationale: [e.g. describe here the review approach (in-depth evaluation, scope review of monitoring data, scan of stakeholder views, etc.) and the rationale that made choosing such an approach]

Ofcom already carried out market assessments and, under the Digital Economy Act 2010, now has a duty to provide a report every three years on the UK's communications infrastructure.

Baseline: [The current (baseline) position against which the change introduced by the legislation can be measured]

That these measures are implemented next year (based on the assumption that Ofcom would have to consult which could take six to nine months.

Success criteria: [Criteria showing achievement of the policy objectives as set out in the final impact assessment; criteria for modifying or replacing the policy if it does not achieve its objectives]

That the objectives are realised (e.g. the auction of 800MHz and 2.6GHz is able to take place sooner than would otherwise have been the case.

Monitoring information arrangements: [Provide further details of the planned/existing arrangements in place that will allow a systematic collection systematic collection of monitoring information for future policy review]

Ongoing use of Ofcom surveys and market assessments that monitor the UK mobile sector. Competition assessment ahead of upcoming auction of 800MHz and 2.6GHz

Reasons for not planning a PIR: [If there is no plan to do a PIR please provide reasons here]

N/.A