A Telefónica company

O2's Response to Ofcom's Consultation Award of available spectrum: 2500-2690 MHz, 2010-2025 MHz and 2290-2300 MHz of 11 December 2006

Executive Summary

O2 (UK) Limited ["O2"] welcomes this opportunity to comment on Ofcom's consultation on the award of 2500-2690 MHz, 2010-2025 MHz and 2290-2300 MHz (the "Spectrum Bands"). Ofcom is required to act in accordance with its statutory duties and the principles of administrative law. In its consultation document Ofcom has proposed to auction the Spectrum bands. In so doing, Ofcom has relied on a fairly basic premise, that is, that more spectrum licences equate to more competition which is good for output and therefore beneficial to consumers. Ofcom has focussed on satisfying its primary duty to further the interest of consumers, where appropriate, by promoting competition.

The consultation does not sufficiently consider the award in the context of all of Ofcom's statutory duties.

The Spectrum Bands and the 3G core band are equivalent resource inputs to the downstream mobile communications market. It is a matter of law that like cases should be treated alike, further, that companies in the same market and subject to the same regulatory framework should be treated alike.

Accordingly, Ofcom's statutory duties and the principles of administrative law require that the Spectrum Band and 3G core band licences have the same terms and conditions.

In order to avoid breaching its statutory duties by assigning the Spectrum Band licences on disparate terms to the 3G core band licences, Ofcom needs to complete the 3G liberalisation process including, *inter alia*, removing the rollout obligation from O2's licence and specifying that O2's 3G licence will be of an indefinite duration after the expiry of its fixed term in 2021.

We note that Ofcom believes that the terms and conditions of the existing 3G licences are not relevant to the auction and, despite being more burdensome than those proposed for the Spectrum Bands, has adopted the view that the existing 3G MNOs are not being unduly discriminated against.

The main argument advanced by Ofcom for not changing the 3G core band licences, in light of the award of the Spectrum Bands is, effectively, *caveat emptor*. Ofcom believes that the 3G licensees purchased their licences in full knowledge of the terms and therefore accepted the licences as written. This argument is incorrect and contrary to law.

Ofcom's spectrum management policy has changed since the award of the 3G core band licences. Ofcom is required to ensure, on an on-going basis, that licences have the minimum terms necessary and that all licence terms are consistent with its prevailing spectrum management policy, UK and Community law.

In addition to addressing the above issues in greater detail, O2 has provided further extensive comment on Ofcom's proposals for the Spectrum Bands. In summary:

- O2 believes that Ofcom needs to allow a clearer European regulatory picture to emerge, in relation to harmonisation. If the auction is conducted with uncertainty in this area smaller bidders will be disadvantaged as they will be less able to gauge the impact of future decisions in Europe.
- Divergence from the CEPT band plan for 2500-2690MHz is not economically efficient and would not allow the UK to enjoy the welfare benefits of harmonisation (through cheaper devices and equipment). The presence of TDD at the top of the 2500-2690MHz band will render much, or all, of this band unusable by mass market FDD equipment.

- The packaging and auction design is flawed in a situation where TDD channels appear in the top of the band part way through the auction. In the auction round where TDD appears, the value of FDD lots will be significantly diminished for the reason above. FDD bidders will be left exposed if the prevailing price for FDD lots is above their market value in a scenario with a TDD interferer at the top of the band. This “exposure problem” does not apply to TDD bidders and the auction design is, consequently, discriminatory.

For the reasons above, O2 believes that Ofcom’s proposals to allow flexible allocation of TDD in the 2500-2690MHz are flawed and that Ofcom should adhere to the CEPT band plan.

We look forward to taking these matters forward with you in due course.

Yours sincerely

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About this Document

For the remainder of this consultation we shall refer to the three spectrum packages on offer as:

a) Spectrum Bands – all three packages together

b) 2500-2690 MHz – “2.6GHz” or “2600MHz”

c) 2010-2025 MHz – “2010MHz”

d) 2290-2300 MHz – “2300MHz”.

The use of the terms parity/symmetry and disparity /asymmetry are used synonymously throughout this document.

Spectrum licence terms are determined by the prevailing spectrum management policy

Ofcom’s spectrum trading and liberalisation policy has been developing for some time and O2 has always supported this, in principle. There is an expectation that trading and liberalisation will be extended to the existing 3G licences at some unspecified date in the future.

In the RA’s 1996 white paper “Spectrum Management: Into the 21st Century” the RA identified many of the issues that Ofcom is now grappling with in relation to the introduction of trading:

- security of tenure;
- competition issues;
- the interaction between AIP, spectrum auctions and trading.

In its 1998 consultation “Managing Spectrum through the Market” the RA began to explore liberalisation, but appeared to view it as an impediment rather than a pre-requisite for trading, in particular at para 4.5:

> *“The transition from apparatus licensing to property rights would be a complex process to manage. A move to spectrum property rights would considerably complicate the introduction of spectrum trading and appears not to be essential.”*

The RA also discusses licence tenure at §§4.23-4.25 of that document. In particular it discusses converting perpetual licences to fixed term licences to provide sufficient certainty of tenure to allow spectrum trading.

In the 1999 Information Memorandum on the 3G auction, DTI discussed spectrum trading (at s2.2.8) but did not discuss liberalisation.

One thing is evident from the above analysis, Ofcom’s position on spectrum trading, liberalisation, licence duration, in fact most elements of its current policy, have been subject to considerable variation from 1996 to date.

Prevailing spectrum management policy informs a regulator’s decisions as to licence terms, when it enters into an assignment process. Potential licensees are able to bid for licences, but it is Ofcom which sets the terms of a licence – there is no negotiation on terms. Acceptance of terms at assignment is not, as a matter of law, an acceptance of those terms in perpetuity (by either the licensee or Ofcom).

O2 is unaware of any lawful constraint on Ofcom converting O2’s 3G licence to equivalent terms and conditions to those proposed for the Spectrum Bands. As the remainder of this response demonstrates, this is the *minimum* that the law requires.

Ofcom's Statutory Duties, UK and Community Law

Question 1: Do you agree with these proposals for the awards of the three bands or have any other comments on the contents of this document?

Ofcom's consultation, as its title implies, focuses upon the auction of the Spectrum Bands. However, Ofcom has failed to recognise that its decision is likely to be, in effect, a decision to extend the terms of the new licences to the existing 3G MNOs. It is not clear how it could rationally conclude that disparity of licence terms is appropriate given Ofcom's duties in UK and EC Law.

These issues in relation to parity of licences must be dealt with in the same depth and given the same amount of consideration as the decision on the Spectrum Band auction with, of course, an opportunity given for respondents to comment.

Whilst Ofcom may be planning to address some of the issues relating to licence parity in the future, Ofcom's duties and its obligations under UK and EC law require the issues to be addressed within the scope of the current consultation, or more importantly, before the issuance of a regulatory statement on this consultation.

This response demonstrates that:

- There are important issues about licence parity which Ofcom will need to consider (albeit it is not clear how it could rationally conclude that disparity is appropriate);
- Ofcom's current, limited consideration of disparity is inadequate to resolve these issues; and
- Ofcom needs to consider these issues prior to proceeding with the auction, because they are inextricably linked with the decisions to proceed and as to the terms on which to proceed.

Accordingly, given its statutory and EC law duties, it would be both unlawful and irrational for Ofcom to refuse to consider parity issues prior to proceeding with the auction.

<u>Spectrum assignments are equivalent</u>

O2's key concern is that Ofcom does not appear to recognise that the spectrum to be assigned at the auction is equivalent to the UMTS spectrum assigned to the five 3G operators in 2000. The implications of this equivalence have not therefore been properly considered by Ofcom in the Consultation, in the context of assessing the extent to which the proposals fulfil Ofcom's duties and comply with its obligations under UK and EC law.

The Consultation makes proposals in relation to the terms and conditions of new licences. Ofcom has attempted to argue that the licences are not equivalent on the basis that the circumstances surrounding the award of the licences are different. This is clearly misconceived. The licences are equivalent because what is being licensed i.e. the spectrum bands, are equivalent; the existing 3G licences and proposed licensees could compete in the same markets.

Equivalence of spectrum assignments

Ofcom has, in its Consultation, attempted to set out the factors which differentiate spectrum bands (in §§6.58-6.59). Taking these characteristics in turn, O2's view is that the 2600MHz and 2010MHz bands to be auctioned are equivalent to the 3G spectrum. The following table addresses the various attributes raised by Ofcom at §§6.58-6.59 as being areas where the

existing 3G assignments might exhibit significant differences from the Spectrum Bands. The table below demonstrates that, in fact, any differences are not such that they warrant markedly different licence conditions. Where differences do arise they result from Ofcom's own proposals, rather than anything technically intrinsic to the spectrum.

	3G Core Band Spectrum licensed to the five MNOs	**Spectrum to be auctioned by Ofcom**	
Spectrum band	1900-1920MHz (TDD) and 1920-1980MHz / 2110-2170MHz (FDD)	2010-2025MHz	2500-2690MHz Split between paired and unpaired proposed to be dependent on the award process and "clock" bids.
Total capacity	140MHz	15MHz	190MHz
Harmonisation	Internationally allocated to IMT-2000/UMTS systems in Europe under RR 5.388A, with utilisation harmonised through ECC Decision ECC/DEC/(06)01.	Internationally allocated to IMT-2000/UMTS systems in Europe under RR 5.384A, with utilisation harmonised through ECC Decision ECC/DEC/(06)01.	Internationally allocated to IMT-2000/UMTS systems in Europe under RR 5.384A, with utilisation harmonised through ECC Decision ECC/DEC/(05)05.
Technical licence conditions	Technology specific. All licensees elected to use UMTS (UTRA (BS) FDD and UTRA (BS) TDD) systems. Relevant performance standards are TS 125.104 and TS 125.105.	Technology neutral, but proposal based on transmitter spectrum masks has been derived from UTRA specifications TS 125.101, TS 125.102, TS 125.104 and TS 125.105.	Technology neutral, but proposal based on transmitter spectrum masks has been derived from UTRA specifications TS 125.101, TS 125.102, TS 125.104 and TS 125.105.
Maximum power	Maximum permissible EIRP for BS 62dBm/carrier (58dBm/MHz).	Maximum permissible EIRP for BS proposed to be 54dBm/MHz.	Maximum permissible EIRP for BS proposed to be 54dBm/MHz.
Fade margin and building penetration loss	The total fade margin, of which building penetration loss is a component, varies according to the area to be covered. The variation in total fade margin that O2 applies in areas requiring building penetration is [✂..].	Since this spectrum band is only slightly lower in frequency from 2100MHz O2 takes the view that the building penetration losses would be similar to the 3G core band. The variation in applied total fade margin is also expected to be [✂..].	Since this spectrum band is only slightly higher in frequency from 2100MHz O2 takes the view that the building penetration losses would be similar to the 3G core band. The variation in applied total fade margin is also expected to be [✂..].
International constraints	CEPT Recommendation ERC/REC/ 01-01 relates to border co-ordination of UMTS in this band. International co-ordination MoUs for the UK in this band are based on this Recommendation.	CEPT Recommendation ERC/REC/ 01-01 relates to border co-ordination of UMTS in this band. International co-ordination MoUs for the UK have not been developed for this band.	CEPT Recommendation ERC/REC/ 01-01 relates to border co-ordination of UMTS in this band. Ofcom is hoping to establish international MoUs based on this Recommendation.
Neighbouring uses and constraints they impose	Neighbouring uses (DECT, S-UMTS and PMSE) impose some restrictions, at band edges, on carrier centre frequencies.	Neighbouring uses (S-UMTS and PMSE) impose some restrictions, at band edges, on carrier centre frequencies. In addition, there is a potential for interference from and into PMSE.	Neighbouring uses include PMSE, SRDs, MSS, aeronautical radiolocation and radio-navigation, and various passive services. There is a potential for interference from and into PMSE.

Prospective changes in technology which can affect the relative suitability of different bands	These bands are currently not liberalised. Any changes to the technology currently licensed require approval from Ofcom of a licence variation.	A technology neutral approach to this band allows alternative technologies to be deployed within the proposed technical licence conditions.	A technology neutral approach to this band allows alternative technologies to be deployed within the proposed technical licence conditions.
Timing of availability of equipment	Available on the market Supported by all major device and network equipment vendors.	Likely to become available as spectrum is released by NRAs.	Likely to become available as spectrum is released by NRAs. On vendor roadmaps
Cost and suitability of equipment that may be made for a particular band	Standard, harmonised band which gives greatest scale of economy benefits.	Standard, harmonised band which gives greatest scale of economy benefits.	UMTS If Ofcom opts to retain the CEPT band plan then O2 expects vendors to supply devices as assignments are made in Europe. WiMAX At Annex D we provide more detailed analysis of recent announcements on WiMAX deployments as well as recapping Ofcom's own assertions about the high likelihood of timely WiMAX mobile broadband investments in the 2.6GHz band.
Cost of spectrum	£22.5bn or £160m per MHz determined by the auction.	To be determined by the auction.	To be determined by the auction.
Demand for spectrum	There were 13 bidders for 5 licences in the 2000 auction.	To be determined by Ofcom's process and timing of the award.	To be determined by Ofcom's process and timing of the award.

In most material respects the assignments are directly comparable, specifically:

- Volume of spectrum available;
- Level of harmonisation;
- Technical licence conditions (or at least their basis);
- Maximum permissible transmission powers;
- Total fade margin – a measure of propagation;
- International constraints.
- Availability of equipment – in fact, with WiMAX equipment available in the US, 2600MHz is in arguably a more advanced position on both the network infrastructure and devices fronts that UMTS was at the time of the 3G core band auction.

Implications of equivalence

Ofcom has a duty to act consistently under the Communications Act 2003 and a regulator has a public law duty to treat like with like. This is a widely acknowledged long-standing principle of good administration.[1] Ofcom must therefore apply the same regulatory treatment to equivalent spectrum assignments unless it can justify disparate treatment - i.e. there is an assumption of parity.

The duty to treat like cases alike means that the decision to offer the new licences on more favourable terms must be accompanied by a decision to offer similarly favourable terms to the existing 3G licensees, unless there are justifiable reasons for it not to do so. As noted above, the spectrum is equivalent. In those circumstances, a duty to treat like cases alike arises,[2] whether or not the licences are granted at the same time.[3]

Ofcom, in its limited treatment of the issue,[4] has not put forward any rational justification for treating the existing licences differently. In particular:

- The circumstances existing at the time of the award do not justify treating analogous cases differently in the current context and given Ofcom's power to vary licence terms.
- The fact that existing licensees can purchase new spectrum is irrelevant if they are treated less advantageously in relation to some of the spectrum they already hold.
- The price paid for the licences reflected Ofcom's power to vary them and duty to remove unnecessary regulatory burdens. Accordingly, it is not clear how Ofcom can rationally conclude that the price paid in 2000 fixed the terms of the licences in circumstances where it recognises that the terms in question should not now be imposed on equivalent licensees.

Parity vs Disparity: Failure to Assess Impact

Ofcom's primary duties include the duty to further the interests of consumers in the market, where appropriate by promoting competition.[5] Ofcom has commissioned research and engaged with stakeholders to analyse the impact of introducing competition in the market to inform its decisions on the Spectrum Bands auction and assess the extent to which its decision will fulfil its statutory duties.

Ofcom has failed, however, to consider the impact of introducing disparity into the market, namely, competition by operators not subject to the same restrictions as the existing players in the market. Nevertheless, this effect is measurable separately from any decision to auction new spectrum.

Given this measurable effect, disparity would undoubtedly have negative consequences for the interests of consumers. It will almost certainly be substantial. We note that, when this

1 See for example Lord Nicholls in *R (G) v Barnet LBC* [2003] UKHL 57, "like cases must be treated alike"; *R v Director General of Electricity Supply ex parte Scottish Power* [1997] EWCA Civ 911; *Waikato Regional Airport Limited and ors v. Attorney General* [2003] UKPC 50 (NZ).

2 *R v Director General of Electricity Supply ex parte Scottish Power* [1997] EWCA Civ 911.

3 C.f. *Waikato Regional Airport Limited and ors v. Attorney General* [2003] UKPC 50 (NZ).

4 See §§6.113 – 6.122 of the Consultation

5 Section 3(1)(b) Communications Act 2003.

issue was considered recently in Denmark, the national regulatory authority (NITA[6]) concluded that parity should be maintained in the same downstream markets.[7]

Any decision to introduce disparity requires further investigation to measure the extent of harmful effects, and Ofcom, in the exercise of its duty to assess the impact of its proposals, will need to inquire into this question. If (as it presently appears) the effect on competition is substantial and adverse, then the only rational course will be to extend the same terms to the existing 3G MNOs.

O2 is not suggesting that the new licences must be offered on the prevailing terms of the existing 3G licences, rather that terms for the new licences and the 3G licences must be the same, if they are to both conform to the appropriate legal test, that is to be the minimum set of terms required to avoid harmful interference, whilst being objectively justifiable, proportionate, non-discriminatory and transparent.

Current Impact Assessment: Omissions

Ofcom will need to inform itself of the implications of a decision on licence parity vs disparity, in particular:

- ***Economic and Market Research***: the proposals set out by Ofcom in relation to the Spectrum Bands licence auctions are informed by a large amount of market research which identifies significant benefit to consumers from the increased competition brought about by the award.[8] Although Ofcom has not made the results of this research available, our perception is that Ofcom has failed to commission any market research on the effect of licence disparity vs parity. Ofcom is an evidence based regulator. It would be inconsistent and irrational not to seek information in relation to the effects of licence disparity, given the need to avoid unfair asymmetry.
- ***Operator information:*** Ofcom has failed to seek any similar information from MNOs.[9]
- ***Scope of Impact Assessment***: it is clear from the scope of the Impact Assessment[10] that, while some issues of licence disparity have been considered (technology neutrality and roll out)[11] other aspects have not (tradability or licence duration). Furthermore, Ofcom itself admits that such analysis is of a summary nature.

It is important to appreciate that the effects of licence parity vs disparity can be distinguished separately from the effects of introducing competition by auctioning the Spectrum Bands. Indeed, O2 commissioned research to show precisely that and the results of this research are produced at Annex A.

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6 National IT and Telecom Agency.

7 O2 has included a review of NITA's evaluation in relation to its recent 3G licence award in Denmark (Annex C). It is noteworthy that DotEcon/Analysys are Ofcom's advisors in relation to the Spectrum Bands and were the advisors to NITA in Denmark.

8 §6.12.

9 Even though it is now over two years since the SFR:IP, Ofcom has yet to engage with O2 and others to quantify the impact of their businesses of a lack of licence parity. O2 has yet to receive a Statutory Information Request on this matter, although Ofcom has been keen to secure information from O2 on many other (more trivial or longer term) matters in recent months.

10 Set out in §A5.8 of the Consultation.

11 See footnotes 12 and 13 below.

Current assessment: Flaws

To the extent that Ofcom's Consultation does consider the effects of licence parity at all, O2 considers the assessment to be flawed. In particular:

- Technology neutrality[12]

  When considering technology neutrality, Ofcom has only given consideration to the benefits of technology and service neutrality on the new licensees and not the effect of withholding those benefits from the 3G licensees.

- Roll out obligations[13]

  Some consideration is given, in the context of roll out, to the risks of potential competition distortion on the 3G licensees as a result of disparity. This is the only time the impact of disparity is dealt with and, in this instance, O2 disagrees with the assessment made for the following reasons:

  i. **Rollout obligations are over- burdensome and do affect scope of roll out**: Ofcom asserts that *"it is also likely that the 3G rollout obligations will have only affected the speed of roll-out not the ultimate extent, therefore reducing the scale of any cost advantage that entrants may enjoy and reducing further the potential for any distortion of competition"*.[14] We supply (further)[15] evidence [✂….]. Ofcom's conclusion in this respect is therefore flawed.

  ii. **Geographically-focussed new entrant distorts tariffs and competition:** Ofcom suggests *"incumbents could respond to a geographically focussed new entrant, including by changing their tariff structure."* This is a classic example of regulation distorting competition and thereby, tariff structures in the market. Ofcom will be acutely aware of the detrimental impact of asymmetric regulation of call termination charges, an effect Ofcom have sought to avoid in the recognition that it is not beneficial in the long term[16].

  iii. **Only a total absence of roll out obligations assures sustainable competition:** New entrants can expect to gain access to national roaming services[17] and therefore maximise their cost advantages whilst minimising their cost exposure (i.e. not maintaining uneconomic infrastructure, by virtue of rollout obligations). This is supplied in our analysis at Annex A.1. Maintaining obligations on MNOs will affect the maintenance of efficient competition[18].

Accordingly, the current, limited assessment of parity does not take into account relevant considerations and to rely on it would breach Ofcom's statutory duty under s7 of the Communications Act 2003 and be irrational. In particular:

- Ofcom must investigate the effect disparity would have on competition, as the impact is measurable and likely to be substantially adverse to the interests of consumers.

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12 § A5.19 of the Consultation.

13 §A5.23 of the Consultation.

14 §A5.23 of the Consultation.

15 [✂……]

16 "Calls to Mobile" – Consultation §§9.63-9.68 13th September 2006

17 It is noteworthy that BT, a company Ofcom quotes as being a potential entrant as a result of this auction, has already negotiated such an access agreement with Vodafone, has mobile numbers and a network code. All BT requires is its own 3G spectrum to become the sixth MNO in the UK market.

18 [✂……]

- Ofcom's conclusions on roll-out obligations are irrational and / or based on errors of fact.

Other statutory duties

Ofcom is obliged to assess parity issues against all of its statutory duties. It could not lawfully focus solely on its primary duties. It seems clear, however, that all of Ofcom's duties would be best fulfilled by creating parity between the existing 3G and the new licensees.

Ofcom has a number of duties under the Communications Act 2003 within the context of which it must reach its decision on applying parity, in particular:

- Its primary duty to further the interests of consumers in relevant markets, where appropriate by promoting competition[19]

  Apart from in relation to roll out, Ofcom has considered the impact on the mobile services market purely by considering the impact of *more* competition. It has not sought to analyse sufficiently the differential impact of competition on disparate terms, in isolation from the effects of market entry *per se*.

  In fact, licence disparity risks distorting the functioning of competition (in the long run) and distorting of the nascent secondary market for spectrum. Annex A discusses this in more detail. There is a critical difference between competition that is *sustainable* on the basis of a symmetric regulatory regime and competition that is *sustained* by inequitable regulation and Ofcom has always recognised that only sustainable efficient competition must be promoted.[20]

  Whilst, therefore, Ofcom believes it might have a well evidenced case for consumer benefit from more mobile spectrum licensees, failure to take into account (by simply not attempting to measure) the harm of introducing inequitable competition, means the consumer benefit may have been overstated. As noted previously, Ofcom must carry out a robust impact analysis to determine the overall effect of licence disparity.

- Ofcom's other duties are also relevant

  We would note that Ofcom has had a tendency to look only to its primary duty and provide only a general assessment on its fulfilment.[21] This is insufficient: the Communications Act sets out a number of duties and requirements all of which Ofcom must have regard to and be transparent in doing so.[22]

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19 s3(1) Communications Act 2003.

20 It is worth noting also that Article 1 of the Access Directive (2002/19/EC) highlights the objective of ensuring sustainable competition.

21 Throughout its analysis of the points raised by MNOs in response to Ofcom's consultation "Spectrum Framework Review : Implementation Plan" (SFRIP), Ofcom repeatedly asserts that its primary duty is of paramount importance and effectively "trumps" any concerns raised in relation to its secondary duties. If this approach is followed to its logical conclusion, this would suggest that all Ofcom's duties, other than its primary duty, are of no value. O2 believes that many of the proposals presented in the consultation on the Spectrum Bands are flawed because of this constant recourse to the primary duty, with no evaluation of whether Ofcom's other duties are achieved or breached as a result.

22 C.f. *R v City of Westminster Housing Benefit Review Board, ex p Mehanne* [2001] WLR 539 at [13] (singling out one factor does not exclude other factors); *R v Secretary of State for the Environment, ex p Torridge District Council* [1997] Env LR 557.

In particular, Ofcom is required to secure:

- ***the optimal use for wireless telegraphy of the electromagnetic spectrum***:[23] Ofcom must therefore assess whether licence disparity, in particular lack of trading and technology neutrality, secures the optimal use of wireless telegraphy spectrum.
- ***the availability throughout the UK of a range of electronic communication services***[24]: Ofcom must assess whether licence disparity, in particular roll out obligations, secures the availability throughout the UK of a range of electronic communication services.
- ***Ofcom must also have regard to***:
    - *Regulatory principles*:[25] Ofcom must assess whether creating licence disparity is *"proportionate, consistent and targeted only at cases where action is needed*". It is not clear how Ofcom can successfully argue that creating licence disparity is consistent.
    - *Spectrum management considerations*[26]: namely the desirability of promoting (i) the efficient management and use of the part of the spectrum available; (ii) the development of innovative services; and (iii) competition in the provision of electronic communications services.[27]
    - *Other factors:* the desirability of promoting competition in the relevant markets;[28](ii) the desirability of encouraging investment and innovation in relevant markets[29]; (iii) the desirability of encouraging the availability of high speed data transfer services throughout the UK;[30] and (iv) in particular, to the interests of consumers in respect of choice, price, quality of service and value for money.[31] [32]

It is difficult to see how Ofcom could rationally conclude that licence disparity would serve these purposes more effectively than licence parity. However, if Ofcom believes this is a possibility, it will need to consider each of them and allow comment on its conclusions. Otherwise, it will breach its statutory duties and the principles of natural justice, and the decision will be tainted by a failure to have regard to relevant considerations and / or irrational.

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23 s3(2)(a) Communications Act 2003.

24 s3(2)(b) Communications Act 2003

25 s3(3)(a) Communications Act 2003

26 S.154 Communications Act 2003

27 It is of note that Ofcom's most recent market review of the UK mobile market found that it is effectively competitive. Therefore, there can be no justification for entry assistance by virtue of asymmetric licensing. Furthermore, Ofcom must consider, most carefully, whether licence disparity will distort a competitive market.

28 s3(4)(b) Communications Act 2003

29 s3(4)(d) Communications Act 2003

30 s3(4)(e) Communications Act 2003

31 s3(5) Communications Act 2003

32 There is a significant risk that the relative attractiveness of the licence terms on offer would incentivise more entrants to the UK market than would be the case if parity were maintained (by virtue of offering the licences on the same terms as those that exist for the current market participants). Competition that is sustained by asymmetric regulation distorts investment incentives, pushes down prices below the (symmetric) competitive level and requires existing operators to respond.

Proposals incompatible with UK and EC law

Licence disparity would also be inconsistent with the non-discrimination requirements of English and EC law.

Ofcom refers to the "*no undue discrimination when imposing terms*" requirement of the Wireless Telegraphy Act but because its analysis on equivalence is flawed (as evidenced above), and its subsequent analysis of the requirements is lacking, Ofcom wrongly concludes the requirement is irrelevant.

In addition, Ofcom fails to consider the requirements of the Authorisation Directive (to which it is required to have regard) which clearly requires that licence conditions be non-discriminatory and objectively justified in relation to the network/service at any time (i.e. not limited to the time and prevailing circumstances at assignment).

Ofcom must conduct a thorough analysis of the compatibility of licence disparity with the requirements and show its reasoning (although it is not clear how it can be successful). Failure to do so would be irrational, in breach of its regulatory principles and duties under the Wireless Telegraphy Act 2006 (WTA) and EC law.

The following sets out the flaws and omissions in Ofcom's analysis.

Requirements of UK and EC law

All rights of use of spectrum must comply with the requirements set out in the WTA[33] namely that, when imposing terms of a wireless telegraphy licence, they

- Do not discriminate unduly against particular persons or against a particular description of persons; and
- Are objectively justified in relation to the networks and services concerned.

Ofcom is also required to consider issues of compatibility with Community law. Ofcom will be familiar with the Competition Appeal Tribunal judgment in *Floe Telecom Limited v Ofcom* in this regard.[34] Ofcom must also ensure its decision complies with the requirements of the Authorisation Directive[35], namely that,

- Conditions for rights of use of spectrum are objectively justified in relation to the network or service concerned, non-discriminatory, proportionate and transparent [emphasis added];[36] and
- When Member States grant rights of use for a limited term, the duration must be appropriate to the service concerned.[37]

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[33] S.9(7) WTA 2006

[34] [2006] CAT 17. In particular: *"This Tribunal, like all courts and tribunals, has a duty to interpret national provisions in conformity with European law as far as possible (Case C-106/89 Marleasing, cited above, Cases C-240-244/98 Oceano Grupo Editorial SA v Roció Murciano Quintero [2000] ECR I-4941). As it is agreed that it is essential for us to consider the scope of the Licence in this appeal it is therefore equally essential to consider the relevant European Directives and for us to interpret, if possible, the provisions of national legislation (the Exemption Regulations) and the Licence in conformity with Community law. The submissions of OFCOM and the interveners in support of OFCOM that we cannot and should not consider issues of compatibility with Community law at all in this appeal are therefore manifestly misconceived…"*

[35] Directive 2002/20/EC.

[36] Article 6(1) of the Authorisation Directive.

[37] Article 5 of the Authorisation Directive.

It is interesting that in the Consultation, Ofcom refers to a requirement to comply with article 7(3) of the Authorisation Directive but makes no reference to the above requirements.

Licence disparity is incompatible with WTA 2006

As noted above, when assigning spectrum, the WTA requires that the terms of licences are

> *"not such as to discriminate unduly against particular persons or against a particular description of persons".*

Ofcom's views are that its proposals are not unduly discriminatory in respect of the existing MNOs. [38] It is worth examining the bases of this statement in more detail:

- Undue Discrimination Test

  Ofcom states 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 a lack of objective justification for the treatment given*."[39]

  Ofcom argues that the circumstances of the 2G/3G operators and the spectrum band holders are different because of the circumstances surrounding their award. O2 has shown that this is not relevant. O2 submits that only the characteristics of the spectrum assignment should be taken into account when determining whether Ofcom is justified in treating licensees differently, not the circumstances of their award.

  By analogy with the Undue Discrimination Guidelines developed by Ofcom in relation to SMP providers (and in the absence of any other relevant case law in relation to the interpretation of "*undue discrimination*" in relation to licence conditions), "*services*" must be provided on the same terms unless there are any objectively justifiable differences in the circumstances of their provision which justify different terms or unjustified differences which cause harm. [40] In this case, the "*services*" are clearly constituted by the "spectrum assignments" in question and the equivalence of the spectrum has been established above.

- No Objectively Justified differences

  Ofcom is proposing to apply different terms in relation to roll out, usage rights, tradability and duration. Ofcom however argues that these differences are not unduly discriminatory for the following reasons:[41]

  (A) The prevailing spectrum management policy at the time of the award was different;

  (B) International obligations are different;

  (C) EU legal context has changed;

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38 §§6.113-6.126.

39 §6.116

40 O2 is not aware of any case law that provides a yardstick for the application of undue discrimination by Ofcom (as opposed to by an operator). Support for the above approach is provided by Ofcom itself. The concept of undue discrimination from the communications framework (SMP Guidelines) may be regarded as setting the standard in this regard. In these guidelines Ofcom concludes that "*undue discrimination*" in relation to the provision of services (i.e. an equivalent offering) only occurs where the discrimination; (i) cannot be objectively justified by relevant differences in customers' circumstances; and (ii) causes harm to competition. As will be evidenced below, there is no objective justification for the differences.

41 The justification that the manner of the award is different does not apply to 3G and is therefore not listed here since O2's focus is on 3G parity.

(D) Services offered could compete in different downstream markets to 3G.

(A), (B), and (C) above all relate to circumstances which were relevant at the time of the award. They are not however relevant to the circumstances in which the assigned 3G spectrum and the Spectrum Bands are currently being (or could be) used. They may therefore constitute an objective justification for subjecting the new licensees to the proposed terms but they are not an objective justification for disparity.

By analogy, where an operator enters into an agreement for the provision of services to a third party and the regulatory circumstances change, that operator is not able to argue that it will only apply the new terms in relation to any new contracts for the provision of equivalent services but will not amend the existing contracts on the basis that at the contracts were entered into, the regulatory circumstances were different.[42]

In relation to (D), just because spectrum could be used in another downstream market, as well as the mobile communications market, does not mean it cannot be used in direct competition to O2 in the mobile communications market.

There appear to be no justified differences in circumstances which could apply. It cannot be argued that the circumstances of the licensees themselves are different (e.g. new entrant vs 3G operator) since the potential new licensee could be a 3G operator (there is no proposal to exclude 3G operators from bidding in the auction).

Furthermore as the new licences are tradable, ownership may vary over time and so if disparity were to be maintained purely on the basis that new licensees were in some way different from existing licensees, Ofcom would be creating a barrier to trading. If a wholly comparable party purchased one of the new licences in the secondary market – what would Ofcom do in order to rectify the disparity issue at that point in time? Would it refuse to authorise the trade solely on the basis of maintaining disparity, ie restricting the class of persons which may own a licence for the Spectrum Bands?

Indeed, it is clear that Ofcom is unable to identify any justified differences, because it goes on to argue instead that the differences will cause no harm and therefore are not "undue".

[42] If one considers, for example, the proposed EC regulation of international roaming charges. O2 doubts that Ofcom would entertain a situation whereby the Regulation only applied to new wholesale IOT agreements rather than those already in place.

- Harm

  Ofcom's SMP guidelines require that where there are unjustified differences, harm must be shown.

  Ofcom appears to argue in the Consultation that no harm can occur since the different conditions were accepted at the time of the 3G auction and reflected in the price paid and therefore "*the award of the licence with the conditions proposed would not be unfair to holders of existing licences*". [43]

  There are a number of points to be made in relation to Ofcom's conclusions in this respect:

  (A) Acceptance of terms of a licence does not negate a requirement on a regulator to apply the same terms to equivalent licensees.[44]

  (B) In relation to price paid:

  - Ofcom can only assert no harm if it has measured the harmful economic effects of licence disparity on the MNO and offset it against the present value of the benefits of liberalisation, which it does not appear to have done;
  - The licence terms at the time of the 3G auction reflect licences with terms derived from the prevailing spectrum management policy. Acceptance of these terms does not mean that the terms were fixed absolutely. As a matter of law, licences will need to remain compatible with Ofcom's spectrum management policy on an on-going basis. Where this policy has changed, Ofcom has a duty to consider whether existing regulatory burdens remain necessary and Ofcom has the power to vary the terms. If licence terms were frozen at the time of the 3G auction, why would Ofcom retain the power to vary licences? Why would O2 have the ability to apply for a variation?;
  - Given the level of prices actually paid in the 3G auction, it would be difficult to argue that the prices paid were somehow insufficient to expect parity of licence terms in the future;

  (C) No requirement to show harm

  The concept of "*no discrimination*" in the Authorisation Directive is arguably a less strict test than that required under WTA.

  This is supported by the view of the European Commission's as set out in its 10th Implementation Report on the Framework for Electronic Communications: *"the application of this concept by the United Kingdom authorities imposes a higher standard of proof than required by EU law, since it arguably involves the need to show a material adverse effect on competition."*

  It is therefore submitted, that "*non discrimination*" or "*no discrimination*" is the appropriate test, rather than "*no undue discrimination*".

  In this case, the argumentation set out above in relation to undue discrimination applies, except there is no requirement on Ofcom to assess harm. The fact that Ofcom argues there is no harm because the 3G licensees accepted the conditions and paid the corresponding fees is irrelevant.

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43 §6.120-122.

44 *R v Director General of Electricity Supply ex parte Scottish Power* [1997] EWCA Civ 911

In the light of the above, it is not clear how Ofcom can successfully argue that licence disparity is not unduly discriminatory.

- Objectively justified in relation to the network or service concerned

  Under the WTA, when imposing licence conditions, Ofcom must ensure that it is "*objectively justified in relation to the network or service concerned*". In the Consultation, Ofcom has indeed set out its justifications for the new licence conditions which it is proposing to impose.

  The requirement under the Authorisation Directive is however wider than that set out in the WTA. It is not sufficient that licence conditions were objectively justified at the time they were imposed, of this is no longer the case. They must be objectively justifiable in relation to the network or service concerned at all times. If changes in circumstances or policy mean that licence conditions are no longer objectively justified, then they must be removed.

  Ofcom's analysis at §§6.93-6.110 shows how, in light of the required legal tests, Ofcom justifies the proposed non-technical licence terms for the proposed 2600MHz licences. As a matter of law, these tests are also the tests that apply, on an on-going basis, to the 3G core band licences. It is instructive, therefore, to walk through Ofcom's analysis and review it in relation to the 3G core band licences.

  - Technology neutral and tradable

    Ofcom sets out in the Consultation, the benefits (or otherwise) of these for the 2600MHz band, a substitute, as:

    > *"As set out elsewhere (see in particular the SFR Statement, SFR:IP Interim Statement and Liberalisation Statement) and consistent with its statutory duties, Ofcom's preferred approach is to impose the minimum necessary restrictions in existing wireless telegraphy licences, giving users more freedom to make use of the spectrum and to deploy the most appropriate services and technologies.*
    >
    > *Any restrictions on spectrum use must be justifiable and proportionate. In matters such as the selection of a technology, or service offering, the risks and potential adverse consequences of regulatory error are high. This is not least given the present rate of change in the communications sector and the imperfect nature of the information available to the regulator. Regulator-led decisions on the technology to use, or service to offer, can have large distorting effects on competition and on the efficient use of resources. There is also no need for Ofcom to specify the technology or service to be used provided the essential requirements of interference management are met."*[45]

    It is difficult to see why the above would not apply equally to 3G core band spectrum. Indeed, given the equivalence between the spectrum and the downstream markets in which it can be used, the above appears to provide an overwhelming case for Ofcom to make the 3G licences technology neutral and tradable. Moreover, Ofcom has recognised in a number of previous Statements that this is the case.

    Ofcom's first real attempt to discuss the issue is made in the Spectrum Framework Review : Implementation Plan[46] which made a number of clear

[45] §§6.95-6.96 of the Consultation

[46] Spectrum Framework Review : Implementation Plan §§7.41-7.42

statements to the effect that Ofcom would attempt to make the existing 3G licences tradable and technology neutral:

> *"Ofcom considers that the extensive regulation inherent in the existing regime creates significant obstacles to the efficient use of spectrum, and to the promotion of competition in the interests of citizens and consumers. These obstacles include, in particular, the absolute barriers to entry into the public mobile communications sector, and the restrictions on the ability of spectrum users to change the way in which they use spectrum to reflect changing market or technological conditions. Both of these types of restriction presently arise as a consequence of regulation.*
>
> *For the reasons discussed in Section 3, and in the other documents that it has published on spectrum management, Ofcom considers that it is in the interests of efficient use of the radio spectrum and the promotion of competition to extend spectrum trading and liberalisation to 2G and 3G mobile services. As in other areas, these policies should allow spectrum to flow more readily to the users and applications that are of greatest value to society, thus furthering the optimal use of the spectrum. In addition, trading and liberalisation should facilitate additional competition and innovation, as barriers to entry are reduced and additional opportunities are created for entry and expansion. Ofcom also considers that a more technology-neutral approach to regulation should facilitate the entry and adoption of new technologies, thus promoting innovation and investment as well as reducing distortions to competition."*

However, in its subsequent statement on this consultation Ofcom deferred further debate stating that the *"issues are very complex and important and require further detailed careful consideration before they can be progressed."*[47] It is only in the consultation on the Spectrum Bands that Ofcom sets out its stall in relation to the implementation of trading and liberalisation into the 3G bands:

> *"Ofcom is planning in the near future to embark on consultations in relation to….liberalisation of spectrum that is currently licensed for 2G and 3G use"*[48]
>
> *"Ofcom expects to issue a consultation document in relation to application of trading and liberalisation to the mobile sector, in the early part of 2007."*[49]

O2 believes that the issues in relation to the existing 3G licences are not particularly complex [✂……].

- Licence duration

Ofcom's analysis demonstrates why indefinite duration licences have significant economic efficiency advantages over licences of a fixed duration[50]:

> *"…indefinite term allows licensees appropriate clarity to plan further investments and operations"*

In addition, such licences are more efficient from a spectrum management perspective, which reflects Ofcom's statutory duties[51]:

> *"The use of licences with an indefinite duration removes the requirement for the return of spectrum to the regulator at the end of a fixed term. This creates*

[47] SFR:IP Interim Statement §2.5
[48] §1.35 of the Consultation
[49] §6.72 ibid
[50] ibid §6.106
[51] ibid

additional opportunities for the market to secure the efficient use of the spectrum, particularly in the presence of spectrum trading."

Such an approach reduces the need for regulatory intervention, allowing Ofcom to further reflect its statutory duties in relation to intervening only where necessary[52]:

"Ofcom considers that this approach [sic], where intervention of the regulator only occurs where there is a compelling case and evidence of market failure, is appropriate to the promotion of efficient use of spectrum. The benefits of this approach include a reduction in the costs of making the spectrum available for new uses or users, and a reduced need for the regulator to be involved in such changes."

Let us now apply Ofcom's logic to the existing 3G core band licences, which it will be remembered have a finite duration, which would:

- deny licensees appropriate clarity to plan further investments and operations; and
- remove or reduce the opportunity for the market to secure efficient use of the spectrum, even in the presence of spectrum trading – because towards the end of the finite period the licences are effectively untradable as there is insufficient time within which the new owner could secure a return on investment; and
- maintenance of the existing approach locks the regulator into intervention irrespective of whether or not there has been market failure. As things stand, licences will be returned to Ofcom at the end of 2021, with all the implications that will have on UK mobile consumers. O2 notes, in this regard, that Ofcom is very clear that it has not set any legitimate expectation of converting the existing 3G licences to an indefinite duration subject to a minimum duration to 31st December 2021.

  "Ofcom did not make any proposals for amending the term of licences that have already been awarded by auction, namely the 3G licences…"[53]

  "Ofcom does not believe there is an automatic linkage between the approach generally proposed for new awards and the treatment of licences already auctioned. It proposes to consider case by case the merits of any change to the terms of licences already auctioned."[54]

o Rollout obligations

From Ofcom's analysis[55] of the 2600MHz licences, O2 can only conclude that Ofcom does not believe in rollout obligations as an effective economic tool to ensure efficient use of the spectrum:

"roll-out obligations are unlikely to be required to meet the objective of ensuring that the spectrum is used efficiently. This is because spectrum trading and liberalisation and Administered Incentive Pricing provide or enhance the incentives to use spectrum efficiently with the relevant degree of flexibility for licensees to conduct their business."

Furthermore, in a situation where a regulator has to act in a way that *"take[s] the utmost account of the desirability of making regulations technology*

[52] ibid §6.107
[53] Spectrum Framework Review : Implementation Plan – Interim Statement (28th July 2005) §3.32
[54] Ibid §A.5
[55] §6.108 of the Consultation

neutral"[56] Ofcom concludes in its analysis of the 2600MHz licence conditions that[57]:

"it is difficult and potentially arbitrary to set roll-out obligations when technology neutral licences and potentially varied users are involved……it may be that some uses based on particular coverage areas may in fact be more efficient and deliver greater benefits than other potential uses based on greater coverage areas. There is a risk of distorting the award and potentially de facto excluding some potential users by imposing roll-out obligations."

Indeed, as far back as its 2004 Statement on Spectrum Trading[58] (at 6.22) Ofcom set out its view of such obligations:

"Ofcom believes that, in some cases, an evaluation of the conditions now may reveal that there could be more appropriate ways of achieving the underlying objectives of non-spectrum licence conditions. Indeed, in relation to certain conditions, the development of trading may provide a new incentive which means that certain obligations could be removed from licences. Having considered the responses to the November consultation, Ofcom expects to review any remaining conditions over the next few years to consider whether these conditions remain objectively justifiable and proportionate. This review should facilitate the trading process and may help to reduce market distortions that could arise if licences with non-spectrum licence conditions are thereby made less valuable and more difficult to trade."

It is worth recapping the original rationale for the rollout obligations that reside in O2's 3G core band licence. The basis of the rollout obligation was discussed prior to the issuance of the 3G Information Memorandum, specifically in the DTI's 1997 consultation "Multimedia Communications on the Move" which, at §6.10) stated:

"licences should set a minimum acceptable coverage and roll-out obligation consistent with the efficient use of spectrum and the need for an operator to provide a reasonable level of service to its customers." [emphasis added]

The introduction of trading and liberalisation for the 3G licences would leverage onto the 3G licensees all the economic incentives outlined in Ofcom's own analysis of rollout obligations in relation to 2600MHz. Therefore, the dual rationale for the obligation set by the DTI in 1997 would fall away.

Ofcom states, clearly (see above), that *"efficient use of spectrum"* is better achieved through the presence of trading and AIP and that *"level of service"* is not best defined by civil servants looking into their crystal ball, but is subjective and relates to the technology and business plan of an operator.

O2 can only conclude that in light of the expectations in relation to the extension of trading and liberalisation to the 3G core band licences, that the rollout obligation within its licence will be removed. To do otherwise would be inconsistent with Ofcom's own analysis in the case of the Spectrum Bands.

It is not clear how, in the face of Ofcom's materially changed view of justified non-technical licence conditions, that Ofcom could objectively justify applying different conditions to the same network/service.

[56] Article 8(1) Framework Directive
[57] §6.109 of the Consultation
[58] http://www.ofcom.org.uk/consult/condocs/spec_trad/statement/sts.pdf

Ofcom has recognised that to impose the licence conditions of the existing 3G licensees on the new licensees would be unjustifiable. Ofcom however has failed to identify any relevant difference between existing and prospective licensees which would make the existing 3G conditions justifiable in the current climate.

Scope of consultation and timing

The above analysis shows that there are serious issues in relation to licence parity, which Ofcom will need to consider. To date, its attempts to grapple with these issues have been inadequate.

O2 acknowledge that Ofcom is aware of the concerns about disparity and that Ofcom is making some attempt to deal with them, namely:

- ***Trading and technology neutrality:*** Ofcom expects to consider the issues surrounding alignment of current 2G and 3G licences to the Spectrum Band licences in relation to trading and technology neutrality in the context of a consultation on trading and liberalisation. This consultation is due to be published in the next few months.

  It is not clear, given the significance of the issues involved, that, were a Consultation to be issued in the proposed timetable (which is not by any means guaranteed), a decision on the issues would be finalised prior to the auction of the Spectrum Bands.

- ***Alignment of roll out obligations:*** The roll out obligations are due to be fulfilled by the end of 2007. Ofcom has consulted on the issue of compliance with the roll-out obligations. [✂……]. Whilst, in the past, rollout obligations have been removed from licences once met,[59] it is by no means certain that this will be the case for the 3G core band licences. There is no guarantee, at present, therefore, that rollout obligations will be removed from the 3G core band licences prior to the auction of the Spectrum Bands. In any case, the obligation to maintain the network is itself an onerous one and needs to be considered separately.

- ***Duration****:* O2 is not aware of any proposals from Ofcom to consult on altering the limited duration of the existing 3G licences.

Ofcom appears to have assumed that O2's concerns about this period of uncertainty are driven by a desire to *"avoid new competition from new entrants."* In fact, O2's concerns are based on the possible negative effects of the decision on the market. It has three particular concerns.

Possible adverse effects on competition resulting from delay

First, the failure to take a decision on disparity prior to the auction has a real potential to cause an adverse effect on efficient competition. O2 and Oxera's research shows that there is a measurable effect on competition resulting from disparity and the conclusions NITA reached on a similar parity issue suggest that the effect will be substantial.

The new licensees, following a short roll-out period, will be capable of competing with the existing 3G MNOs. Even if Ofcom resolves the parity issues at a later date, the adverse effect of a period of disparity may be significant and potentially lasting. Ofcom is not in a position to guarantee that it will make a decision on parity issues soon after the auction, and

[59] Most notably the 2G licences of Orange, O2, Vodafone and T-Mobile – during the implementation of the Licensing Directive.

accordingly it cannot rely on an assumption that it will deal with parity quickly to justify proceeding with the auction.[60] It is well-known that administrative decisions often exceed their initial timetable for a variety of reasons.

Moreover, an inefficient competitive advantage to the new licensees in the initial period might well have lasting negative effects on the market, even if Ofcom manages to resolve parity issues in the short term.[61]

Ofcom may believe that the consumer benefit of proceeding with the auctions immediately will outweigh any potential harm to consumers and / or existing 3G licensees resulting from a period of disparity.[62] It has, however, so far failed to take into account the possible harm resulting from a period of disparity. Ofcom will need to assess that harm before deciding whether to proceed with the auction. Furthermore, if there is substantial and / or lasting harm, then it may well be that the marginal benefit of proceeding with the auction in the short term is insufficient to justify Ofcom's proposed approach.

This is likely given that Ofcom has already acknowledged that there would be other substantial costs to proceeding with the auction without resolving parity issues. In particular, there is a significant risk that uncertainty will lead to an inefficient allocation of the spectrum, which the secondary market might well be incapable of curing.[63]

Accordingly, even if it proposes to consult on parity issues, Ofcom needs to consider carefully the effect of disparity over an uncertain period following the auctioning of the new spectrum. That effect might well justify delaying the auction until parity issues have been resolved.

Proceeding with the auction without resolving parity issues would be unlawful

Secondly, as noted above, there is a powerful argument that disparity would be in breach of the WTA 2006 and Authorisation Directive, because of its discriminatory effect. The WTA and Authorisation Directive impose an absolute obligation to avoid discrimination. It cannot be qualified by assurances that the issue will be considered in the future, over an uncertain – and possibly expanding - timescale. The fact that Ofcom may well address that discrimination later does not absolve it of responsibility to act in a non-discriminatory fashion. Accordingly, Ofcom needs to consider this issue before proceeding with the auction.

Ofcom cannot assert that no harm would result from the discrimination because of its consultation on liberalisation of the existing licences, as WiMAX operators will be able to compete, on preferential licence terms, in the same market as the existing 3G MNOs

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60 C.f. *Waikato Regional Airport Limited and ors v. Attorney General* [2003] UKPC 50 at [71].

61 If prices are forced below the competitive level, consumer expectation is unlikely to allow them to recover to the level that would have existed without entry assistance.

62 §6.44-6.48.

63 Ofcom may rely on the claim that *"to the extent that there might be any inefficiencies in allocation of spectrum under an early award, it will always be possible for these to be addressed through trading in the secondary markets"* (§6.76). This is a complete reversal of position from Ofcom's earlier position at §3.25 of the SFR:IP Interim Statement and in the "Digital Dividend Review" at §§8.26-8.27 where Ofcom says *"…we cannot rely on the secondary market being entirely efficient and low cost. We have to accept that the market may be somewhat inefficient and the costs of achieving a re-assignment of the spectrum quite high. In these circumstances there could well be a benefit from delaying the initial award if by doing so the cost of reassigning the spectrum through the secondary market could be reduced or avoided, or if a more beneficial outcome could be achieved than would be likely through the secondary market."* Ofcom has failed to give any explanation for its reversal on the effectiveness of secondary markets. In the light of its earlier, reasoned treatment, reliance on them to ameliorate inefficiencies in the market appears plainly irrational.

immediately after the licences are issued. The existing 3G MNOs might also suffer harm from being forced to purchase additional spectrum in order to protect against the possibility of discrimination. In any case, harm is not required under the Authorisation Directive and arguably not under the WTA 2006.

Accordingly, Ofcom needs at least to carry out a full analysis of the discrimination issue before proceeding with the auction.

Failure to consult properly on delay

Finally, we note that, in any event, Ofcom has failed to consult properly on delay.

Ofcom relies on the extent of the benefits to consumers as justifying the decision to proceed with the auction. However, Ofcom has failed to make available the market research which underlies its conclusions on consumer benefit. Accordingly, it is virtually impossible for O2 to respond meaningfully to Ofcom's conclusion that there would be substantial benefits to consumers in proceeding immediately. It is possible that, on examination, those benefits would prove overstated and therefore insufficient to outweigh the advantages of further certainty on parity and possibly other issues.

Ofcom has a duty to provide sufficient information for O2 and the other parties to respond meaningfully to the consultation paper.[64] At least, it should make the research available and then allow a further opportunity for comment.

Ofcom may maintain that opportunity to comment would make no difference, but the courts are slow to reach that conclusion when there has been a failure to observe natural justice.[65]

Ofcom should therefore make the market research available for consultation before proceeding with the auction. That obligation is additional to the requirement that Ofcom consider parity issues before proceeding with the auction.

64 *R v P Borough Council, ex p S* [1999] Fam 188, 220C-G)

65 See, e.g. *R v Chelsea College of Art and Design, ex p Nash* [2000] ELR 686 at [50].

European Developments

Question 6: Do you agree Ofcom should aim to award the bands 2500-2690 MHz, 2010-2025 MHz and 2290-2302 MHz by the end of 2007, while keeping the position on the 2.6 GHz and 2010 MHz bands under review in the light of possible developments in European regulatory fora?

O2 notes that Ofcom considers a release of spectrum by the end of 2007 is achievable based on the proposals set out in the consultation. We agree that the first of the Spectrum Bands, the 2300MHz band, could and should be awarded before the end of 2007. However, we do not consider that either the 2010MHz or the 2.6GHz bands should be awarded by the end of 2007. O2 considers that the award of these bands should only proceed once all the relevant issues have been resolved and, in addition to the issues discussed above, there are several European decisions pending that will not be resolved, in our view, until 2008 at the earliest. The awards should certainly not be forced artificially into a predetermined timeframe.

Ofcom itself notes that there are a number of factors that could impact the timetable of the proposed awards, including possible European harmonisation measures that are currently being worked on. Ofcom then states that it will seek to remove uncertainties where possible, but without causing delay; we interpret this to mean that Ofcom plans to proceed even whilst uncertainties remain over some issues. This is inefficient and unjustified, giving rise to considerable legal and commercial uncertainty. O2 considers that there are some European harmonisation issues that cannot be addressed in this way. Issues associated with the development of a common European approach to the 2.6GHz band are amongst those that we believe cannot be left with uncertainty whilst Ofcom proceeds with an award. Despite the fact that the Commission decided last year not to proceed with the technical implementation measure covering this band that was first proposed to the Radio Spectrum Committee (RSC) in 2005, the recent Commission Communication on flexibility[66] states:

> *"the Commission will … push for a common European approach to the 2.6 GHz band, in order to find a proportionate and consistent solution"*

The Commission has previously cautioned against disregarding harmonisation initiatives, encouraging Member States:

> *"to refrain from proposing/adopting draft technical measures which are inconsistent with harmonisation proposals under preparation".* [67]

The Commission has also stated[68]:

> *"In the bands that are identified for flexible use, common and minimally necessary conditions attached to the rights of use should be set out by the end of 2007 in a Commission Recommendation."*

Two of the bands identified by the Commission for flexible use are the 2010MHz and 2.6GHz bands. As Ofcom acknowledges, the Commission has issued a mandate to CEPT to prepare a technical study on the use of a number of bands for mobile communications under

66 Communication from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions, COM(2007)50 "Rapid access to spectrum for wireless electronic communications services through more flexibility", 12 February 2007.

67 For example, in Radio Spectrum Committee document RSC 06-103 "Notifications under Directive 98/34 in relation to Radio Spectrum Decisions", 20 November 2006.

68 COM(2007)50

least restrictive technical conditions, as part of the implementation of the principles adopted in Europe under the Wireless Access Policy for Electronic Communications Services (WAPECS). CEPT is due to report back to the Commission in July 2007 and, as foreseen by the recent Commission Communication on flexibility, this will lead to a Commission Recommendation by the end of the year. Whilst not in itself being a binding harmonisation measure, this Recommendation will lead in turn, as stated in the Communication, to *"the new approach to spectrum management proposed by the Commission in the context of the review of the framework"*. More significantly, *"minimal technical usage conditions for the bands are to be established through technical implementation measures adopted under the Radio Spectrum Decision[69]"*. It is therefore clear to O2 that the timetable associated with the harmonised adoption of flexibility in European spectrum management will be:

- February 2007 Commission Communication on flexibility
- July 2007 CEPT response to Commission WAPECS mandate
- December 2007 Commission Recommendation on common and minimally necessary conditions attached to the rights of use
- From 2008[70] Binding technical implementation measures establish minimal technical usage conditions for the WAPECS bands

O2 notes Ofcom's statement: *"The UK does not need, as a binding constraint, to wait for an RSC Decision before proceeding to the award of these bands in the UK"*, but that Ofcom *"will take full account of any developments in the European regulatory fora during the course of 2007 in deciding whether to proceed with the release of these bands"*. In the consultation, Ofcom concludes that its current view *"is that the prospective developments in the European position over the coming year are likely to be consistent with an award as proposed in autumn 2007."* We believe that the statements made in the Commission Communication, published after the consultation, are inconsistent with the proposals and that Ofcom should wait until the binding technical implementation measures relating to both the 2010MHz and 2.6GHz bands have been established.

Compatibility with CEPT Decisions

In addition to the need to remove the uncertainty that now exists over harmonisation measures that we believe will be established in 2008, O2 is very concerned that the proposals do not offer sufficient compatibility with the rest of Europe. This will leave the UK isolated and, consequently, UK consumers will be faced with more expensive services and devices. Ofcom has noted that the UK *"can choose to"* implement CEPT Decisions such as the Decision regarding the harmonised utilisation of spectrum in the 2.6 GHz band. O2 is pleased to observe that Ofcom has not said it has decided not to implement this CEPT/ECC Decision[71]. We welcome this approach, which leaves open the option for UK to elect to implement the Decision at a later date, once the responses to the consultation have been taken into account.

One of the central issues relevant to the proposed award of the 2.6GHz band concerns the degree of flexibility in the way the band can be used and the amount of paired spectrum and unpaired spectrum that there should be in the band. Whilst O2 acknowledges that Ofcom considers regulators to be ill-placed to judge the appropriate balance between these alternative uses of spectrum, we believe strongly that this is **not** a decision that can be left to

69 Decision 676/2002/EC.

70 It should be noted that the Commission may introduce binding technical implementation measures at an earlier date for WAPECS bands than 2008, as it has most recently done for the 900/1800MHz bands.

71 ECC/DEC/(05)05.

the award process as proposed, as it has severe implications on some potential bidders that would distort the auction. Our response to Q15 discusses this issue further.

Ofcom claims that its proposals *"should allow the relevant degree of technical compatibility between equipment that is likely to be used in the UK and internationally."* However, whilst Ofcom has acknowledged the need to retain the 120MHz duplex separation between the uplink and downlink parts of the paired spectrum allocation, and taken this into account in designing its award proposals, it has singularly failed to take into account the needs of international users, whose use of terminal equipment designed to the paired channelling arrangements defined in ECC/DEC/(05)05 (the "CEPT plan") would be severely impaired by any use of the downlink band by unpaired systems in the UK, as well as imposing potentially significant additional costs for non-standard equipment on successful paired spectrum bidders. These additional costs would, inevitably, lead to higher prices for UK consumers.

The difficulty arises because **all** CEPT-plan compliant mobile terminal receivers will be blocked by any unpaired (TDD) signals in the downlink frequency range 2620-2690MHz. This effect is caused to a small extent by the top TDD channel in the centre block (2610-2615MHz), where the CEPT-plan compliant mobile terminal receiver filter slope crosses over with the TDD transmitter filter slope, but most significantly is caused by any TDD channel at the top end of the 2.6GHz band because CEPT-plan compliant mobile terminals have receiver front ends that are open to the full downlink frequency range. Ofcom's own consultants have described the situation[72] as follows:

> *"Blocking can occur when an interferer transmits in a channel in the victim's reception band*
> *…*
> *Within the 2.6GHz deployment scenarios considered in this report, interference due to blocking might occur if TDD systems are deployed within the receiver pass band of an FDD system.*
> *…*
> *Mitigation cannot easily be applied to mobiles other than by tailoring the FDD mobile receiver band, which may make the mobile 'non-standard'.*
> *…*
> *Filtering at the TDD base station does not resolve this problem, as the legitimate TDD transmissions cause the blocking.*
> *…*
> *The conclusion of this discussion … is that it is difficult to fully mitigate the effects of TDD systems causing blocking in the FDD downlink band without introducing 'non-standard' FDD mobile equipment with a reduced receive band… which would be more expensive and could affect roaming."*

The implications of this issue are explored further in our response to Q15.

Compatibility with ETSI Standards

O2 notes that Ofcom has tried to simplify the design of the packaging of the 2.6GHz band to make the proposals as easy as possible to understand. However, in doing this, Ofcom has unfortunately precluded one of the more efficient uses of the spectrum. The main proposals divide the spectrum into two main types of lot, which are intended to mirror the CEPT band plan. The first type of lot is described in Ofcom's summary as "a single, unpaired 5MHz

[72] Mason Communications Ltd "2500-2690MHz, 2010-2025MHz and 2290-2302MHz Spectrum Awards – Engineering Study (Phase 2)", November 2006.

channel in the central part of the band from 2570-2620MHz." Ofcom notes that, although these lots are referred to as "unpaired", as they are not paired with other channels *within* the 2.6GHz band, a successful bidder could choose to pair these with other spectrum *outside* the 2.6GHz band, such as the 2010MHz band. O2 would be content if the channels in the central part of the band were indeed made available as *"single, unpaired 5MHz"* channels, available for pairing with other spectrum outside the 2.6GHz band.

However, when Ofcom then considers in detail how best to package the unpaired part of the band it concludes that, because of the high probability for interference between either adjacent paired/unpaired (FDD/TDD) uses or unpaired/unpaired (TDD/TDD) uses, a restricted block of spectrum is needed between each neighbouring licensee in the unpaired block, as well as between the unpaired and paired blocks. This effectively means that the unpaired lots are no longer *"single, unpaired 5MHz channels"*, but are actually dual, unpaired 5+(nx5)MHz channels, which precludes the most efficient realisation of the "external pairing" option that Ofcom, evidently, intended to offer.

O2 notes that work is proceeding in ETSI on the standardisation of the "UMTS external" option[73]. Current proposals to ETSI MSG include the specification of two new externally linked bands:

- 1900-1920MHz paired with 2590-2610MHz or with 2600-2620MHz;
- 2010-2025MHz paired with 2585-2600MHz, if ongoing studies show that a 15MHz duplex separation from the FDD uplink band at 2500-2570MHz is feasible[74], or 2015-2025MHz paired with 2610-2620MHz.

The details of these linked bands will be decided once a conclusion has been reached on the required duplex separation. This standardisation activity is expected to be complete in April 2007. O2 continues to support the development of this option within the family of ETSI UMTS standards.

What is already clear, however, is that the most efficient utilisation of spectrum for external pairing will occur only if Ofcom were to introduce a third main type of lot into its packaging proposals, as follows:

a. The first type of lot would consist of a pair of 5MHz channels with a duplex spacing of 120MHz, as currently proposed by Ofcom;

b. The second type of lot would consist of a dual, unpaired 5+(nx5)MHz channel in the bottom part of the central part of the band, above 2570MHz; and

c. The new, third type of lot would consist of a single, unpaired 5MHz channel in the top part of the central part of the band, below 2620MHz.

This new type of lot would need to be designated as FDD downlink (DL) spectrum, and should be located at the top end of the unpaired block of spectrum, adjacent to the (internally) paired FDD DL blocks, to ensure that no additional guard channel is required. This proposal is more efficient than Ofcom's current proposal as there would be no need for guard channels or reduced utility blocks between externally paired FDD lots or between the highest frequency externally paired FDD lot and the lowest frequency (internally) paired FDD lot.

This issue is explored further in our response to Q9.

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73 See, for example, ETSI MSG #13 Draft Report, January 2007.

74 Current studies indicate that a 20MHz duplex separation is achievable.

Impact of Ultra-Wide Band Devices

Ofcom has described the current status of European discussions regarding Ultra-Wide Band (UWB) devices. In our response to Ofcom's earlier Consultation on UWB[75] O2 noted that whilst, from an economic standpoint, it may be true that increasing noise levels in the 2.6GHz band have zero impact on economic value (for example, auction payments would be depressed to take account of extra base stations), there are (less measurable but by no means insignificant) impacts in terms of the overall detriment to citizens:

- More masts will be needed as a result of Ofcom's own actions: Citizens are sensitive to mast location.
- Revenues to the Exchequer from auctions benefit UK taxpayers. Payments by MNOs to overseas equipment vendors for more base station equipment do not.
- If UWB noise degrades battery life of mobile terminals it dilutes the utility of the 2.6GHz band for mobile uses, when compared to its utility for fixed (powered) applications. This is not a "technology neutral" outcome for Ofcom's spectrum management policy.

Consequently, O2 supported a -85dbm/MHz PSD limit in mobile bands below 3GHz in that consultation.

We are therefore pleased to note that a -85dBm/MHz PSD limit in frequency bands below 3.8GHz (i.e. including all of the Spectrum Bands) was agreed at the RSC in December 2006[76].

Asymmetric impact of uncertainty on smaller bidders

Historically Ofcom has made much of its desire to attract as many bidders as possible to auctions. This is good for efficiency. Critically it has identified (and specifically designed auctions to accommodate) the needs of the smaller, under resourced, "weak" bidder.

Such bidders do not tend to have access to the specialist help or advice that will be required to effectively evaluate certain risks to their business plan (whether absolute or marginal) and the implications on their bidding strategy. Consequently, uncertainty caused by Ofcom's desire to press ahead of Europe might, ironically, scare off the small innovative firms that Ofcom has, so far at least, sought to nurture through its assignment processes.

75 O2 UK Limited response to Ofcom's consultation on Ultra-WideBand, March 2005.

76 RSC document RSC06-90 Final "Draft Commission Decision on allowing the use of the radio spectrum for equipment using ultra-wideband technology in a harmonised manner in the Community", 8 December 2006.

Uses in the Spectrum Bands and Adjacent Spectrum

Question 2: Do you agree with the analysis in section 5 or have any comments on adjacent interference issues?

Ofcom has presented a comprehensive summary of the technical constraints that are created by the existence of other allocations and spectrum uses in so far as they impact on the way that the Spectrum Bands can be made available for award. We note that, in summarising the issues, Ofcom appears to ignore the impact that in-band use also has on adjacent use due to the receiver characteristics of adjacent band equipment. Whilst we recognise the difficulty in specifying the usage rights of the Spectrum Bands to account for this constraint, nonetheless we believe that the receiver characteristics of systems currently deployed in the adjacent bands need to be taken fully into account to ensure that existing services are not burdened with significant requirements to mitigate against potential incoming interference. This is particularly relevant to the adjacent use of spectrum, for all three of the Spectrum Bands, by Programme Making and Special Events (PMSE) equipment, which appears to us to be heavily burdened by the imposition of a requirement for additional filtering that Ofcom implies needs to be self-funded.

O2 notes that Ofcom has stated that, *"when different uses have the same priority ranking in the regulatory framework, then the earlier use generally has rights over the later use"* [emphasis added]. We would like Ofcom to clarify when such rights arise and what are the exceptions to the widely held belief that incumbent services that comply with their licences have rights over incoming (adjacent) services to the extent that the burden of providing any mitigation that may be required is imposed on the incoming service.

With regard to the analysis presented in section 5 of the consultation O2 makes the following comments and observations.

Comments and Observations relating to the 2.6GHz band

- We support the decision to downgrade the status of the radio astronomy sites that operate in the band 2655-2690MHz to category D (no protection). We assume that this decision will be implemented prior to the award of the Spectrum Bands.
- We agree with the proposal not to protect the passive (earth exploration-satellite and space research) service in the band 2655-2690MHz.
- We support the CEPT position on the World Radio Conference 2007 (WRC-07) Agenda Item 1.9 to propose "hard" power flux density limits for satellite systems at a level guaranteed not to cause an interference issue for terrestrial services in Europe from satellite services elsewhere.
- We note Ofcom's "hope" that an MoU based on the limits from CEPT Recommendation ERC/REC 01-01 (which has been modified and approved most recently at the Helsinki meeting of CEPT/ECC Working Group FM in January 2007 and includes both the 2010MHz and 2.6GHz bands) will be established with ComReg "in the near future". We urge Ofcom to ensure that this exercise is completed before the spectrum awards and that a truly representative picture of the potential for interference from the MMDS operators is presented in future documentation. In this regard we note that the "worst case analysis" provided in the technical report is based on the powers, antenna heights and locations derived from the Irish MMDS planning guidelines document. We question the value of this data as the "worst case" picture of potential interference presented in the technical report shows that "UMTS base

station reception will suffer interference across Northern Ireland" and "will cause degradation to networks on the west coast of mainland UK". We do, however, also note Ofcom's qualifying statement:

> *"Actual MMDS network deployment parameters may differ from those defined in the reference ComReg document…"*

We sincerely hope that this proves to be the case, otherwise Ofcom's claims that the 2.6GHz band award will be a "UK-wide" licence will be severely undermined!

- We note that the French administration will be awarding spectrum licences in the 2.6GHz band compliant with the harmonised utilisation of spectrum in the 2.6GHz band given in CEPT/ECC Decision ECC/DEC/(05)05, and that Ofcom is currently working with the ANFR to develop a cross border MoU based on ERC/REC 01-01. Again we urge Ofcom to ensure that this exercise is completed before the spectrum awards.
- We note that PMSE services use the band 2450-2500MHz and that there is the potential for interference both incoming and outgoing from PMSE equipment from and into the bottom of the 2.6GHz band. Without mitigation this impact would affect a number of channels in the 2.6GHz band due to the wide band spectrum mask of the video links used by the PMSE sector. The effect on PMSE is more severe in the case of interference to PMSE equipment from TDD base station transmissions in the lowest 2 channels (2500-2510MHz). Ofcom states:

  > *"Use of a 30dB filter reduces the separation distances considerably to the point where interference between the two uses should not be a major issue, though PMSE airborne use may still be problematical and may need to be restricted in the immediately adjacent channel…"*

  We are unsure if Ofcom is proposing that PMSE users will be required to provide their own mitigation protection for/from new licensees. If this is the case, then this appears to run counter to the widely held belief, shared by O2, that incumbent services such that comply with their licences have rights over incoming (adjacent) services to the extent that any mitigation required is imposed on the incoming service. We request that Ofcom clarify their intentions in this regard.
- We note that a similar effect to that potentially experienced by PMSE users can be expected from TDD base station transmissions in the lowest 2 channels interfering with MSS (Globalstar) terminals.
- We note Ofcom's intention not to place restrictions on transmissions from the 2.6GHz band to take account of the radio astronomy allocation at 2690-2700MHz. However, we are unsure how Ofcom would adjudicate on the relative rights of the new licensees compared to the use of the adjacent band by the radio astronomy service (RAS) if the future plans of the radio astronomy community in this country were to change, given that the RAS has a primary allocation with Category A (i.e. full) protection in that band. The assurance that Ofcom gives prospective licensees that "there are no plans for future research projects in the band" may not be sufficient reassurance for some. Clarifying the process by which Ofcom would assess the responsibility for mitigation of any interference caused by incoming licensees in the 2.6GHz band to future radio astronomy projects would go some way to avoiding the potential difficulty that incoming licensees might face if, following the award, the plans of the radio astronomy community were to change and base stations sited within 100km or more of radio astronomy sites needed to be shut down.

- The same clarification regarding the earth exploration-satellite and space research services is requested, given that they also have primary allocations in the 2690-2700MHz band. How would Ofcom assess the responsibility for mitigation of any interference caused by incoming licensees in the 2.6GHz band to future passive service projects?
- Ofcom's Technical Study notes that there are approximately 38 civil radars in operation in the 2700-3100MHz band, sited mainly at or near airports. The results of Ofcom's studies highlight that there are significant areas where radar signals will exceed the interference threshold of a typical (UMTS) receiver at the top end of the 2.6GHz band. Even in the middle of the FDD downlink band (2645-2650MHz) there are large areas affected. We note that Ofcom then conclude, through a chip loss analysis, that it is the newer, solid state systems that may cause service degradation in channels towards the top end of the band, primarily due to their longer duty cycles. Ofcom then state:

  > *"Although there are relatively few solid state radars in operation within 100MHz of the award band at the moment, as older magnetron and TWT radars are replaced, solid state technology will become more common."*

  With these conclusions in Ofcom's own Technical Study, it seems strange to O2 that Ofcom then conclude in their consultation that the potential for interference *"seems unlikely to be significant".*

Comments and Observations relating to the 2010MHz band

- We support Ofcom's proposal to respect ECC Decision ECC/DEC/(06)01, relating to the guard band necessary at the lower band edge to prevent interference with the Mobile Satellite Service in the adjacent band.
- With regard to the potential interference from the MoD, we request Ofcom to be more specific about the nature of the risk that is "low but cannot be entirely ruled out".
- We note that, currently, use of the band 2025-2110MHz by PMSE, including airborne PMSE, starts at 2030MHz but that a band re-plan cannot be ruled out. As before, we are unsure if Ofcom is proposing that PMSE users will be required to provide their own mitigation protection for/from new licensees. If this is the case, then this appears to run counter to the widely held belief, shared by O2, that incumbent services that comply with their licences have rights over incoming (adjacent) services to the extent such that any mitigation required is imposed on the incoming service. We request that Ofcom clarify their intentions in this regard.
- We support Ofcom's proposal to respect ECC Decision ECC/DEC/(06)01, relating to the guard band necessary at the upper band edge to prevent interference with the space science services in the adjacent band.

Comments and Observations relating to the 2300MHz band

- We do not believe that this band has been "identified on a world wide basis for IMT-2000" as stated in the consultation. We concur with Ofcom's expectations that it is very unlikely the band will become harmonised within Europe.
- With regard to the potential interference from the MoD, we again request Ofcom to be more specific about the nature of the risk that is "low but cannot be entirely ruled out".
- We note that the band 2200-2290MHz is used by PMSE, and we assume that this includes airborne PMSE. Once again, we are unsure if Ofcom is proposing that

PMSE users will be required to provide their own mitigation protection for/from new licensees. If this is the case, then this appears to run counter to the widely held belief, shared by O2, that incumbent services that comply with their licences have rights over incoming (adjacent) services to the extent such that any mitigation required is imposed on the incoming service. We request that Ofcom clarify their intentions in this regard.

Ofcom's decision to auction the Spectrum Bands

Question 3: Do you agree that Ofcom should authorise use of the spectrum bands 2500-2690 MHz, 2010-2025 MHz and 2290-2300 MHz?

The SFR:IP and O2's Response

O2's principle concern, as articulated in our response to the SFR:IP and in subsequent correspondence with Ofcom, is that Ofcom does not plough ahead with its auction for the Spectrum Bands without a conclusion on the liberalisation of 3G licences. We have further developed our views on this issue in our response to Question 1, above. O2 does not agree with Ofcom proposal that, in the absence of parity of terms with the 3G core band licences, Ofcom should authorise the use of the Spectrum Bands. Whilst we welcome certain informal indications about what might happen in relation to existing mobile licences [§6.58, §6.70, §6.72], these noises are not sufficient and a conclusion on the issue of the 3G licences is required.

Ofcom is right to highlight at §1.35 that delays to its proposed award timetable may be induced by (poor outcomes of) consultations on liberalisation of the mobile bands.

O2 wishes to reserve its position on the implications of Ofcom's forthcoming consultation on 2G liberalisation until Ofcom has published that consultation.

No **real** demand for the Spectrum Bands is identified by Ofcom

At §6.32 of the consultation, Ofcom can only quote BT[77] and Nomad as actual potential users of the Spectrum Bands, the rest appear to be manufacturers keen to stimulate a market for their equipment. Without sight of Ofcom's market study it is hard for O2 to assess independently whether Ofcom has made a well informed objectively justified and proportionate decision.

It is surprising that Ofcom has failed to make this information available. Unless the market assessment is made available, Ofcom's decision is insufficiently reasoned and makes it impossible for O2 and other parties to respond meaningfully on the extent to which the proposed new licences would promote the interests of consumers[78].

[77] At this stage O2 wishes to contrast the position Ofcom has adopted in relation to BT (the dominant provider in the fixed market) on any future investment in Next Generation Access, ie that *"it is important that we start to provide clarity on the regulatory regime for next generation access networks in a timely manner, so that any lack of regulatory clarity is not a contributory factor in the timing of future investments"*, with the total lack of regulatory clarity Ofcom is proposing to provide to the MNOs (which operate in a competitive market) in relation to their future investments in new spectrum rather than re-use of their existing assignments. We believe that Ofcom would not wish to open itself to allegations of double standards. Ofcom's general duty to regulate consistently under s3(3) of the Communications Act would appear to be relevant here.

[78] *R v P Borough Council, ex p S* [1999] Fam 188, 220C-G

Question 4: Do you agree that awarding licences by auction would be the appropriate mechanism for authorising use of the spectrum bands 2500-2690 MHz, 2010-2025 MHz and 2290-2300 MHz?

O2 is of the view that auctions are the most appropriate and transparent mechanism for the award of spectrum subject to the elimination of distortions to the bidding that could result from Ofcom's regulation of other related and/or substitutable spectrum.

Question 5: Do you agree that it is likely to be in the interests of citizens and consumers to proceed with the award of the 2.6 GHz and 2010 MHz bands as soon as practicable, rather than to delay the award pending reduction in uncertainty relating to other bands?

First, O2 wishes to draw Ofcom's attention to its legal analysis above. Secondly, we note the "leading" nature of this question and Ofcom's apparent over reliance on its primary duty. O2 believes that a more appropriate question would be:

"Do you agree that it is likely to be consistent with Ofcom's duties to award this spectrum……"

Benefits of an early award are overstated

O2 believes that Ofcom has overstated the benefits of any early award because it has not taken into account the harm caused to the 3G MNOs by licence disparity. Without sufficient analysis in this regard Ofcom's analysis is not sufficiently robust to proceed to a proportionate decision, unless the impact is removed by creating parity.

Benefits of an early award versus costs of delay – the TDD proponents' position

Benefits of early award

Ofcom highlights three main types of benefit that its market research has identified as being achievable through this auction [§1.6 and §6.41]. They are:

i. New entry into the relevant downstream markets: reducing barriers to entry and expansion will lead to an increase in output and reduce prices and this will benefit consumers;

ii. Authorising the use of the Spectrum Bands for technologies such as WiMAX will increase innovation because the 2.6GHz band is potentially the only band available for WiMAX in the UK;

iii. Existing operators will be able to reduce their costs by having more spectrum for UMTS. More spectrum will alleviate capacity bottlenecks and reduce the need for cell splitting. This benefits citizens as well as consumers, the former through fewer mast sites and latter through lower costs (as the highly competitive access and origination market is likely to pass through these cost reductions to consumers).

The effect of more competition and reduced costs on the MNOs, (i) and (iii) above, are believed to be "very material". This suggests to O2 that:

- Ofcom needs to, therefore, thoroughly assess whether the impact of that competition is, in part, a result of asymmetric licence terms; and

- Whether the benefits of (iii) might not be more efficiently realised through the re-use of existing assignments for other technologies.

If this analysis were undertaken then O2 believes that the consumer benefits perceived by Ofcom may be illusory or be substitutes for the consumer benefits claimed by Ofcom for its spectrum trading and liberalisation policy.

We are left, therefore, with the benefits of innovation (ii) which Ofcom admits are subject to "considerable uncertainty". Furthermore, O2 notes the preponderance of WiMAX manufacturers identified in Ofcom's research which, of course, would say that, wouldn't they.

O2 believes that the innovation benefits that could be achieved by the incumbent MNOs will be reduced if there are not the correct investment incentives in place. If Ofcom artificially increases competition by creating preferential terms for new players, it could lead to an increase in the cost of capital for existing MNOs caused by the entry of an operator with preferential licence conditions (see Annex 2.6), potentially disincentivising investment by the existing MNOs and also, therefore, the likelihood of beneficial innovation.

The costs of delay

The costs identified by Ofcom are effectively the lost benefits identified above. It is noticeable that Ofcom is concerned about the possible unavailability of substitute spectrum for WiMAX, highlighting at §6.47 that consumers will be limited to the use of UMTS in the 3G core bands, if there is no 2600MHz auction. O2 wishes to point out that this is, in part, because Ofcom has yet to reach any liberalisation decision on the 3G licences. Again this suggests that the costs of delay can be mitigated through other actions of Ofcom and, in fact, these benefits will be experienced by a greater number of consumers because of the existing customer bases of the MNOs.

<u>The benefits and costs of delay for more information – the FDD proponents' position</u>

The benefits of delay

Ofcom's proposed date (end of 2007 / early 2008) for the auction is fully one year later than advertised in the SFR:IP. Ofcom has been prudent to push back its timetable, such that its thinking in relation to the award of a number of substitute spectrum bands can be more precisely understood.

Ofcom highlights, correctly, that the availability of substitute spectrum through auction is a common value problem. As such, the availability or lack of information will affect potential bidders evenly. O2 believes that a one year delay has assisted in the reduction of this common value uncertainty, although pending decisions in Europe on WAPECS and the use of the Digital Dividend for mobile services will have a considerable impact and as these could be binding Decisions on the UK. Ofcom would be wise to time its award of the Spectrum Bands when there is sufficient certainty in these areas.

What Ofcom has failed to do is to realise (despite the academic paper by Professor Ian Jewitt – one of Ofcom's own advisors) that information relating to 2G liberalisation and 3G liberalisation, ie the utility of spectrum already held by bidders, is a *private value* problem.

Only the 2G/3G MNOs will know:

- [✂….]

[✂…..]

It is likely that other MNOs will be similarly affected. The net result of, at least, a lack of clarity on 3G liberalisation will be to increase uncertainty in the private values (ie errors) of the five most likely potential purchasers of FDD spectrum in the auction of the Spectrum Bands. Such errors will relate to demand (in terms of capacity) and the value, in that uncertainty is likely to increase demand of all five players and consequently given the artificial ceiling set on FDD availability (see below) this will push up prices in the auction. Ironically, given Ofcom's preferred packaging, artificially inflated demand for FDD will restrict the availability of TDD (increasing prices) and affecting the entry of the new, innovative WiMAX players that Ofcom wishes to support.

Professor Jewitt's paper highlights that private value uncertainty increases auction receipts but reduces efficiency – Ofcom's primary objective for auction designs. However, Ofcom argues [at §6.76 bullet 5] *"to the extent that there might be any inefficiencies in allocation under an early award, it will always be possible for these to be addressed through trading in the secondary markets (e.g. if one party acquired more spectrum than they subsequently needed then they could sell this at a later date)."*

There are two problems with this statement:

a. The risks are loaded towards the MNOs (via private value uncertainty), with the WiMAX players only being exposed by virtue of the secondary impact on prices for TDD spectrum in the auction, and, more importantly;

b. This is a complete reversal of Ofcom's previous position that efficiency of primary assignment is of paramount importance, because of the unproven nature of the secondary spectrum market[79].

The costs of delay

The costs of delay are as for the analysis above in relation to the perspective of TDD proponents.

[79] Ofcom's recent consultation "Digital Dividend Review" at §§8.26-8.27 where Ofcom says *"…we cannot rely on the secondary market being entirely efficient and low cost. We have to accept that the market may be somewhat inefficient and the costs of achieving a re-assignment of the spectrum quite high. In these circumstances there could well be a benefit from delaying the initial award if by doing so the cost of reassigning the spectrum through the secondary market could be reduced or avoided, or if a more beneficial outcome could be achieved than would be likely through the secondary market."*

Ofcom's judgement on the balance of the views of the TDD and the FDD constituencies

The costs of delay in the two outcomes above are equivalent, that is the delay in benefits from innovation by WiMAX operators at 2600MHz. However, O2 contends that Ofcom can reduce these losses by liberalisation of 3G core band spectrum.

A key question is, therefore, whether the benefits of delayed award to FDD proponents outweigh the benefits of early award to TDD proponents. In addition, it should be noted that the MNOs are doubly handicapped because of Ofcom's preferred packaging arrangement which allows TDD allocation to match demand, but does not allow (through the absence of clarity on 3G liberalisation) O2, H3G, Orange and T-Mobile, in particular, to increase their options in creating out of band FDD pairings.

As we highlight above, even Ofcom itself recognises that it cannot rely on the secondary spectrum market to resolve any regulatory failure here, and Ofcom has articulated its views on regulatory failure – noting the dis-benefit of one-off irrevocable decisions based on limited information[80].

At §6.76 Ofcom summarises its view on the balance to be struck between improving information for bidders and an early auction, we annotate Ofcom's views below:

- *"There is already a reasonable degree of information available on potential substitute spectrum and Ofcom expects to issue further information over the next year. For example, Ofcom intends to issue consultations on 2G liberalisation and DDR spectrum."*
    - O2 concurs that the delays in Ofcom's plans have allowed more Rumsfeldian "known unknowns" to become known; and
    - [✂….]; but
    - O2 does believe that a 3G liberalisation decision is critically relevant for the reasons of auction efficiency, post-auction competitive equality and minimising distortion of the secondary spectrum market.
- *"The key issue in terms of efficiency of award outcome is for the information to be available equally to all interested parties. To the extent that they have access to the same regulatory information, the potential extent of distortions between bidders in an award as a direct function of the regulator's actions will be limited."*
    - O2 does not agree that distortions will be limited. In particular, 2G and 3G liberalisation issues, which are private value problems for the MNOs, affecting them in their bidding decision and having secondary effects on the supply of TDD and the prices paid by Ofcom's preferred bidders.
- *"It is unrealistic to assume that there will be a point of time in the future when all uncertainties may be removed. Regulatory uncertainty is inherent to regulation of a fast changing sector such as the communications sector and may be modest compared to other sources of uncertainty in an award such as the uncertainty on the levels of demand from users for particular services and their evolution through time."*
    - O2 believes that a reasonable regulator would seek to reduce the uncertainty in relation to decisions which are within its gift. Furthermore, Ofcom's indecision in relation to spectrum appears to be inconsistent with Ofcom's

[80] See the Digital Dividend Review §§6.58-6.51

eagerness to provide regulatory certainty within the fixed market[81]. BT being the double beneficiary of this schizophrenic approach.

- *"Any incremental benefits of delay of the award of the 2.6 GHz and 2010 MHz bands that might be possible through the increase of information over time are likely to be modest and, in themselves, uncertain. In contrast, the analysis described at paragraphs 6.44 to 6.48 above suggests that delaying an award would cause significant costs (in terms of forgone benefits)."*

  Ofcom has neither analysed, sufficiently, the costs to the MNOs of the private value errors nor taken account of the fact that these costs are concentrated within the five players, and cannot therefore come to any reasonable (or reasoned) conclusions about the overall costs of a delay.

[81] In relation to NGA, for example.

Question 7: Do you agree with Ofcom's proposals for licence conditions (technology neutrality, tradability, conditions of tenure and absence of roll-out obligations)?

O2 believes that *all* licences should, *at any time*, only have the minimum terms necessary in accordance with EC law. Consequently, we support Ofcom's decision here, noting that the same logic must apply to existing licences used in the same downstream market.

Competitive impact of asymmetric licence terms

In contrast to Ofcom, O2 has, with Oxera, looked in detail at the potential distortive effects on the functioning of competition of the introduction of licences on asymmetric (preferential) terms, particularly "cherry picking" scenarios which Ofcom appears to believe to be the most likely outcome. At Annex A we have provided greater detail of the analysis from Oxera, we summarise the various effects below.

O2 and Oxera have looked at the implications of differences between licences on a term by term basis, looking broadly at both their competitive implications and the effects this would produce in the spectrum market (where appropriate). Finally we look at the terms "in the round" and show that Ofcom cannot trade-off benefits against harm caused by any decision to liberalise the existing 3G licences, because such benefits and harm express themselves in different ways.

Rollout obligations (see Annex A.1)

The outcome of O2/Oxera's analysis suggests that, in the face of an asymmetrical roll-out obligation, the new entrant without the roll-out obligation will be able to:

- build a network with the same average unit costs as the existing licensees in the areas in which it does build its own network;
- obtain access to the network with a roll-out obligation for those areas it does not cover, at a price below the average unit cost of the existing licensee's network in those areas.

The combination of these two factors means that the new entrant can obtain the same coverage as the existing licensees at a lower total cost, and will therefore have a price advantage over the existing licensees purely as a result of the lack of the roll-out obligation. This advantage will persist, since 2100MHz licence-holders must maintain 80% population coverage until end 2021.

This is incompatible with Ofcom's duty under Section 6(1) of the Communications Act 2003, to ensure that licence conditions are not unduly burdensome, or that their maintenance has not become unduly burdensome.

Our analysis (in Annex A.1.) shows new entrants can expect to gain access to national roaming services[82] and therefore maximise their cost advantages whilst minimising their cost exposure (because, unlike existing licensees, they do not have to maintain uneconomic infrastructure, in order to comply with rollout obligations).

[82] It is noteworthy that BT, a company Ofcom quotes as being a potential entrant as a result of this auction, has already negotiated such an access agreement with Vodafone, has mobile numbers and a network code. All BT requires is its own 3G spectrum to become the sixth MNO in the UK market.

Ofcom does not believe that the existing 3G licences are overburdened by the rollout obligation, or its maintenance going forwards. Ofcom believes that, if anything, the rollout obligation has only affected the timing of investments by the 3G MNOs. O2 does not agree. We supply further evidence at Annex B [✂….]. Ofcom's "summary analysis" is therefore incorrect and insufficient.

[✂…….]

Licence Duration (See Annex A.2)

The use of AIP after a minimum duration gives the 2600MHz licence-holders an option to retain their licence, which the incumbent MNOs do not possess (their licences may be re-auctioned).

While O2 has always had the risk of losing its licence in 2021, the 2600MHz licence-holders will not face this risk. In principle, other things being equal, this simply makes the 2600MHz licences relatively more valuable.

Apart from the increase in valuation for an indefinite duration licence (which will be factored into the 3G expansion band auctions), there is a separate effect on an MNO's forward-looking costs.

This effect occurs as O2 approaches the end of its licence duration (before the licence is re-auctioned), when its capital expenditure programme starts to be affected by the uncertainty about whether it will retain the licence. For example, investments made in 2015 with a ten-year asset life must be written off (with a certain probability) by 2021. The forward-looking cost of network maintenance and upgrades therefore increases since these investments must be recovered over a shorter timeframe.

The increased investment cost will place O2 at a competitive disadvantage, relative to a rival (entrant) MNO that is more assured of its spectrum over the long term.

Finally, continuing uncertainty as to the future of the 3G core band licences [✂…..]. This is unlikely to be viewed as efficient management of the spectrum, by any yardstick.

Tradability (See Annex A.3)

The effect of tradability is to create two classes of licence: reversible and irreversible licences. Assuming that these licences were auctioned at the same time, the reversible licence would be expected to achieve a higher price. The difference in valuation is the exit option—the price that can be achieved in the secondary market if an operator decides to sell its licence.

The gains from the tradability option are realised only if the licence is sold (which is unlikely since it would probably lead to withdrawal from the market or stranding of the associated network assets). Any gains are not expected to yield a competitive advantage since they do not affect forward-looking costs.

Restriction of exit options from the market

Below we comment on the benefits that trading will bring in reducing the risk profile inherent in the current mobile communications market. The current situation makes exit by one or more of the players only possible through consolidation or by returning a 3G licence to Ofcom. This is because:

- Sale of a player to a current non-participant in the UK market is not exit and is so not relevant;
- The sale of the 3G licence on a standalone basis is not permitted, although the sale of a (subsidiary) company incorporating the licence is permitted.

The restriction of exit options arises because the 3G licence contains an obligation to achieve and maintain (ie an instantaneous obligation from the end of 2007) coverage to 80% of the UK population, therefore such spectrum can only be sold (on a standalone basis) to one of the other four national players, rather than any operator that might emerge from the 2600MHz auction, because only the four 2G/3G operators can satisfy the rollout obligation instantaneously on transfer.

Change of Use (See Annex A.4)

Adverse effects arise from the ability of a new licensee to take advantage of new technologies to deliver the same services as the MNOs at a lower cost. A more efficient technology can confer a persistent cost advantage on a new licensee, which cannot be matched by incumbents under the conditions of current 2100MHz licences. As the new licensee with a cost advantage will drive down the market price, incumbents' profits will be reduced while the new licensee would enjoy some price-setting power and positive profits. This implies that asymmetric technological neutrality can reduce the value of incumbents' licences and cause competitive harm. If all licensees were granted technology neutrality, the cost asymmetry would be removed, as would the excess profits for the new licensee. The analysis has therefore shown that technological neutrality on its own has little value, but can be highly valuable if granted selectively.

Analysis of licence differences in the round (See Annex A.5)

The asymmetries identified cannot necessarily be traded off one against another. For example, the benefit of tradability reduces the sunk cost associated with market entry, and so raises the amount an operator might bid for a licence. The absence of roll-out obligations has a different economic effect—it reduces a new licence-holder's forward-looking costs and confers a competitive advantage. Thus, for example, offering the 2600MHz licences without tradability would not offset the harm caused by offering them with technological neutrality, since it would not restore the disparity in forward-looking costs between a new licensee and incumbent operators.

Cost of capital and risk (See Annex A.6)

There is a risk that, as a direct result of the asymmetric licence terms, the costs of capital faced by the incumbents may rise in relation to the costs of capital faced by an entrant.

Three reasons have been identified indicating why O2's cost of capital might increase due to asymmetric licence conditions:

- the potential rebalancing of call versus access revenues, due to the entrant's cost advantage leading to a shift in O2's customer base;

- the potential increase in O2's operational gearing, due to the lower market share accompanied by the 80% roll-out obligation (which substantially reduces O2's ability to reduce its fixed costs if this is commercially desirable);
- the potential increase in O2's debt premium, due to increased volatility in profits following entry by an MNO with a more flexible licence.

These effects may lead to an asymmetry in the cost of capital faced by O2 and an entrant, derived from licence asymmetries.

Conclusions on licence asymmetries

In the light of the conclusions that the asymmetries would lead to differences in forward-looking costs, the potential effects of those differences have been analysed using the main economic models of how competition operates in markets with a few operators ('oligopolistic markets'). This analysis set out to examine whether it was possible to distinguish between the adverse effects of entry (which could have been anticipated at the time of the original auctions and incorporated into the bid price) and entry with preferential licence terms (which would have been considered highly unlikely at the time of the original auctions).

In each of the models of competition examined, the analysis has shown that an adverse effect on incumbents' profits resulting from asymmetric entry can be clearly distinguished from the effects resulting from entry of an operator with equivalent licence terms (and therefore the same forward-looking costs).

In conclusion, there is a risk to the equitable functioning of competition caused by asymmetric licence terms operating in a downstream market, this is effectively intervention by Ofcom in a downstream market that Ofcom itself has found to be effectively competitive. There is no market failure within the mobile market, so the basis for such intervention is highly questionable.

Ofcom will be aware of its recent consultation "Digital Dividend Review" where it addresses the significant risks of intervention[83]:

> *"a major problem faced by regulators and other policy makers is the difficulty of assessing the effects of intervention. The more difficult this is, and the more uncertainty there is, the greater the risk that the assessment will prove mistaken – and the greater the risk of unintended consequences. Unintended consequences may, on occasion, be beneficial, but in general they are to be avoided, as overall they are more likely to damage the efficient use of resources.*
>
> *This is true in relation to assessing the potential benefits of intervention as well as the potential costs. The case for any intervention will depend on taking a view about the future benefits to be derived from a particular use of spectrum. The greater the uncertainty about the future, the greater the uncertainty about those benefits.*
>
> *We think that uncertainty points to caution about intervening in spectrum…."*

O2 believes that Ofcom must ensure that unintended consequences do not arise from its decision in relation to these Spectrum Bands.

[83] §§6.47-6.49 of the Digital Dividend Review

Continuing entry assistance for H3G

Finally, in its response to the SFR:IP, O2 was also rather bemused that Ofcom should consider allowing new entry into the market for mobile communications services, a market that Ofcom considers to have specifically engineered to[84]:

> *"…promote competition in 3G services….and this structure seems to be operating successfully in achieving its objective".*

Ofcom is still exercising unjustified entry assistance for H3G, through the imposition of continuation notices of provisions from the historical licences of O2 and Vodafone, as well as through an unjustified asymmetric voice call termination regime. It is hard to see how Ofcom can regulate in a consistent manner if it persists in entry assistance for H3G whilst introducing more competition to this carefully nurtured new entrant. Ofcom's duty under s(3)3 Communications Act would appear to be relevant in this regard.

84 SFR:IP §9.33

Question 8: Do you have views on whether or not there should be a "safeguard" cap on the amount of spectrum that any one bidder could win in an award for the 2.6 GHz bands and, if so, do you have a view on whether 90 MHz would be an appropriate size for a safeguard cap?

Ofcom's analysis at §§6.149-6.154 of the consultation arrives at a proposal to set a relatively high (although arbitrary) cap on the final individual holdings of spectrum from this award. O2 has three broad comments to make:

- Any decision to set a cap will disproportionately affect purchasers seeking to offer FDD rather than TDD based bi-directional services. Operators of TDD solutions can achieve the same utility as FDD operators with half the spectrum, albeit providing half the capacity in any direction. FDD bidders can only purchase their spectrum in units of 10MHz (2x5MHz), whilst TDD bidders can bid in units of 5MHz. Thus, if the cap were set too low, FDD bidders would have to shade below such a cap to a greater degree than TDD bidders.
- The competition reasons for imposing a cap appear to be completely contrary to the competition reasons used to determine that BT should not be restricted in its ability to acquire spectrum in this auction [§6.146]. Ofcom's analysis here appears wholly inconsistent and unsatisfactory. If Ofcom is concerned about foreclosure of innovation or competition then surely the powers it describes at [§6.146] are equally applicable.
- Ofcom is seeking to create a market for spectrum in which we might see various actors emerge, including market makers and spectrum managers. To place arbitrary limits on holdings of one particular type of spectrum would appear to limit market mechanisms. It is unclear whether the cap would immediately be dropped after the auction or whether this cap would endure as the spectrum began to be traded on the secondary market.

Given Ofcom's view as to the increasingly substitutable nature of spectrum, Ofcom would need to be consistent and set a maximum holding *across the market of substitutes* in order not to disadvantage new entrants with respect to operators, such as H3G and Vodafone, which already have substantial holdings (65MHz and 60MHz each, respectively) of 2GHz spectrum.

O2 believes that such a decision to restrict the bidding behaviour of Vodafone and H3G would need to take place within the context of the regulatory framework for electronic communications and include, *inter alia*, a market review. O2 believes that a cap is not necessary and has not been objectively justified, especially in the context of the substitutability of the spectrum on offer in this award.

Packaging

Question 9: Do you agree with Ofcom's proposal to package spectrum as lots of 2 x 5 MHz for paired use and 5 MHz lots for unpaired spectrum and to allow the aggregation of lots by bidders?

As a general rule, O2 is supportive of proposals that maintain packaging consistent with other Member States in order to maximise the possibilities for economies of scale in compatible equipment.

Ofcom's spectrum policy, see above, does not treat substitute spectrum equally and so compounds the error in diverging from the CEPT band plan.

Packaging and spectrum policy allow TDD supply to flex with demand but does not allow FDD to increase its supply through out of band pairing

Ofcom's proposed packaging allows TDD spectrum in the 2600MHz centre band of the CEPT band plan to be augmented by TDD channels created by the sacrifice of FDD pairings at the top of the band. This is described in some detail by Ofcom in the consultation at §§7.31-7.42.

This appears to O2 to unduly favour the demands of TDD proponents, allowing their auction prices to be lowered by increasing the availability of their chosen mode of spectrum. In contrast the maximum amount of FDD spectrum is limited to:

- The FDD spectrum in the CEPT plan (minus any spectrum lost to TDD); plus
- Potential out of band pairings with 2010-2025MHz[85] and 2290-2300MHz[86].

Ofcom, highlights the demand for out of band pairings as being a key driver in deciding to award 2010MHz and 2600MHz together[87], although it believes that the likelihood of such pairings is low.

Notwithstanding the scepticism of Ofcom's consultants,[88] Ofcom has decided to jointly award the 2010-2025MHz and 2600MHz spectrum in order to both allow TDD proponents to switch between substitutes and facilitate out of band pairing for FDD proponents, should this be desired.

In light of the potential for bidders to construct an out of band pairing in the auction, there is no valid reason why Ofcom's spectrum policy should preclude such a pairing (or at least increase the uncertainty over the pairing or devalue such a pairing) for TDD core band spectrum already licensed to O2, H3G, Orange and T-Mobile. This policy would appear to be highly discriminatory and spectrally (as well as economically) inefficient – breaching a number of Ofcom's duties.

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85 As previously noted, work is proceeding in ETSI on the standardisation of the "UMTS external" option. The details of these linked bands will be decided once a conclusion has been reached on the required duplex separation, which is the subject of ongoing study. This standardisation activity is expected to be complete in April 2007. O2 continues to support the development of this option within the family of ETSI UMTS standards.

86 Noting that this would be a non-standard UK specific pairing.

87 §2.16 and §§7.18-7.19.

88 Which, incidentally, appear happy to accept the crystal ball gazing of WiMAX proponents, but not those of MNOs and FDD proponents.

Out of band pairings of 2600MHz with the TDD spectrum already awarded to the MNOs

O2, H3G, Orange and T-Mobile each have 5MHz of unpaired TDD spectrum in their core band assignments awarded at the 3G auction in 2000. These blocks have a finite life, can only be used for UMTS, cannot be traded and are subject to the rollout obligation.

In contrast, 2010-2025MHz, a direct substitute, will not be subject to such restrictions. Bidders will be able to pair uplinks in 2010MHz with downlinks from 2600MHz and have their pairings licensed on the same basis.

Ludicrously, Ofcom is proposing that in order to achieve such pairings with their existing substitute spectrum O2, H3G, Orange and T-Mobile would have to make do with:

- An uplink that expired in 2021 thus reducing the utilisable life of any pairing for FDD to this finite life, rather than the indefinite life granted to the downlink; and
- no clarity as to whether an MNO could change the use of its 5MHz to be the uplink of an FDD pair (subject to interference considerations) – as a matter of policy; and
- no clarity as to whether any deployment of the uplink could now be made, in light of the need to provide a service (and maintain that service) to 80% of the UK population by the end of this calendar year.

By operating an asymmetric licensing regime in respect to the 5MHz blocks held by O2, H3G, Orange and T-Mobile, Ofcom is reducing the utility and hence the valuation an MNO would place on such a pairing, relative to any valuation an MNO (or others) might place on a 2010MHz/2600MHz pairing. This might force these MNOs to purchase 2010MHz (a duplicate for their current holdings) in order to de-risk such an investment. This appears to O2 to be a wholly inefficient outcome, something Ofcom should seek to avoid rather than dismiss as being “unlikely to arise” based on a dubious market study. Although Ofcom’s spectrum policy purports to allow the market to decide the best use for spectrum, it does not appear to be adhering to this policy in relation to potential out of band pairings with existing spectrum holdings of the MNOs.

Question 10: Do you agree with Ofcom's proposed approach to allowing the respective amounts of paired to unpaired spectrum for the band 2500-2690 MHz to be varied (maintaining the 120 MHz duplex spacing and allowing additional unpaired spectrum, if needed, at the top end of the band)?

O2 believes that Ofcom has a difficult balance to strike between:

- Maximising the assignment efficiency of the award; and
- Minimising the transaction costs of the process; and
- Ensuring that all parties are treated equivalently by the award design; and
- Encouraging participation by using the most simple and transparent process possible.

Above we highlight how the proposed design, or at least the design in conjunction with asymmetric licence terms on the existing core band TDD spectrum, will tilt the availability of resources towards the TDD proponents and provide no method for FDD proponents to increase their supply of their favoured type of spectrum beyond the CEPT band plan. This is particularly discriminatory against O2, H3G, T-Mobile and Orange which would have to purchase 2010-2025MHz to achieve a core band – expansion band pairing that was technically equivalent to something they could do with their existing assignments, if correctly liberalised.

Below we highlight some further complications caused by the design in relation to a sudden loss of substitutability of spectrum part-way through the auction (see Q15), this may lead to highly inefficient outcomes.

Historically, Ofcom has placed great weight behind the simplicity of auctions, tending to favour sealed bid processes. The proposed packaging adopts the other extreme, with a highly complex process with three price and demand functions. It is not clear to O2 that Ofcom has sufficient evidence of potential demand differences between TDD and FDD flavours to warrant such an extravagance.

O2 believes, therefore, that the merits of bullets three and four above should outweigh those of one and two – and lead us to conclude that the packaging should not allow for extra TDD channels to be created at the expense of FDD pairings, as identified in the CEPT band plan.

Question 11: Do you agree with Ofcom's proposals for a 5 MHz restricted block between FDD and TDD neighbours and between TDD and TDD neighbours and with a modified out-of-band base station mask for second adjacent 5 MHz blocks?

O2 agrees with Ofcom's technical consultants[89] that operation of FDD and TDD systems at full power in adjacent channels is not feasible, and that co-existence at 10MHz or 15MHz offsets is also not feasible in the worst case, without mitigation. A number of mitigation techniques have been considered in the engineering study including site engineering, filtering and some techniques that are specific to TDD systems (power control and synchronisation) and we are content that, with suitable mitigation techniques applied at base stations or with site co-ordination, most potential problems can be overcome. However, we remain unsure if and how Ofcom intends to mandate these mitigation techniques to ensure interference between adjacent licensees is minimised – will Ofcom require a Code of Practice to be developed or will it leave it to market forces? We note that these mitigation techniques will be required regardless of the approach taken on technical licence conditions (see below).

As Ofcom's consultants conclude:

> *"TDD/FDD base station co-location can potentially be achieved for frequency separations of 15MHz or more with suitable mitigation. With frequency separations less than this, co-location can be achieved with the co-ordination of services between operators.*
> *…*
> *Detailed site co-ordination between adjacent TDD systems will… be required at less than 15MHz offset"*

We are also content that Ofcom's proposals for restricting the power levels permitted in the adjacent block and modifying the standard out-of-band emission masks would protect the adjacent and second adjacent channels at FDD/TDD and TDD/TDD boundaries. We note that the additional restrictions above standard values are applied to base stations only, to ensure that standard mobile terminals can be deployed, thus maximising the economy of scales benefits from the use of standard European terminals.

Question 12: Do you agree with Ofcom's proposals to award the 2010 MHz band as a single 15 MHz lot?

O2 believes the more material issue is whether other core band spectrum should be converted to the same terms as this piece of spectrum, which is in the same band.

Question 13: Do you agree with Ofcom's proposals to award the 2290 MHz band as a single 10 MHz lot?

O2 believes that this is correct, and that this auction should precede the main award.

[89] Mason Communications Ltd "2500-2690MHz, 2010-2025MHz and 2290-2302MHz Spectrum Awards – Engineering Study (Phase 2)", November 2006.

Auction Design

Question 14: Do you agree with Ofcom's proposals to combine the award of the 2.6 GHz and 2010 MHz bands and to hold the award of the 2290 MHz band separately and in advance?

This approach would appear to be sensible in light of the analysis presented.

Question 15: Do you agree with Ofcom's proposals for a two-stage auction design for the 2.6 GHz and 2010 MHz bands?

The proper analysis of an auction design needs to consider two things:

- The objectives of the auction itself; and
- Whether these can be expressed efficiently in an auction design.

At §6.4 Ofcom sets out its objectives for the award as:

a) The efficient management and use of the radio spectrum;

b) The economic and other benefits that may arise from use of the spectrum;

c) The development of innovative services; and

d) Competition in the provision of electronic communications services.

The use of an auction can be efficient if appropriately designed and, subject to the resolution of the issues of licence parity, would make the spectrum available for use to those that valued it most. Such a process would also secure (d), by definition.

However, O2 believes that the current auction design is deficient in at least five respects:

a) The ability to increase the size of the TDD block creates the potential for additional TDD/FDD boundaries, and sterilises spectrum to an extent that would not exist were the CEPT band plan to be maintained;

   - In the limit, where all 38 channels are used for TDD, and each of the 19 lots is sold to a different bidder – 19 blocks will be used as guard channels, ie 50% of the spectrum will be of reduced utility. Adherence to the CEPT plan (assuming each of the TDD blocks is sold to a different user.) would reduce this sterilisation to 13%.

b) Competition is not maintained, because of the unfair advantages provided to bidders for TDD spectrum in the auction (see Q5);

c) By limiting the unpaired lot size to 5 + 5MHz a large number of reduced utility channels may be required between TDD users. This appears to be particularly spectrally inefficient in the presence of a large number of TDD bidders;

   - By increasing the minimum package size for TDD to, say, 5+10MHz would reduce the measure in the case where all 38 channels are sold for TDD to 32%.

d) The proposal precludes the most efficient usage of the unpaired block, which would allow bidders to opt for an "externally paired FDD lot" within the unpaired block. These lots, designated as FDD downlink spectrum, should be located at the top end of the unpaired block of spectrum, adjacent to the (internally) paired FDD DL blocks. If Ofcom were to allow up to 35MHz of the centre block as externally paired FDD spectrum (to be paired with the 1900-1920MHz and 2010-2025MHz bands), the potential sterilisation could be reduced to the minimum possible 2 blocks, or 5%, as

there would be no need for guard channels or reduced utility blocks between externally paired FDD lots or between the highest frequency externally paired FDD lot and the lowest frequency (internally) paired FDD lot.

e) Whilst a clock-proxy auction is very efficient and removes strategic bidding problems to a large degree, it is complicated to implement – Ofcom has opted for a clock-BAFO (best and final offers) auction. Below we highlight the implications of this accommodation in relation to divergence from the CEPT band plan.

Points a) and b) above are remedied by sticking to the CEPT band plan. Point c) is addressed by selling the unpaired spectrum in larger lots.

O2 does not believe that Ofcom has sufficiently analysed the auction design in relation to its efficient spectrum usage, which O2 notes is one of Ofcom duties.

FDD lots are not of equal utility and this is exacerbated when the band plan diverges from CEPT

The issues associated with adjacent channel interference have been considered in detail by Ofcom and its consultants. The studies conducted by Ofcom's consultants have highlighted that adjacent channel interference issues (at the FDD UL/TDD boundary) can be mitigated to a large extent, when separated by 10MHz, through site co-ordination and the use of additional FDD base station transmitter filters (Technical Report §5.1). Nevertheless, this needs to be taken into account at the FDD UL/TDD boundary, making the FDD lots of unequal utility because the higher frequency lots would need more mitigation than the lower frequency lots. The possibility of increasing the size of the centre, unpaired block does not increase the number of FDD UL/TDD boundaries, but the consequential introduction of additional TDD spectrum at the top end of the 2.6GHz band introduces not only a second FDD DL/TDD boundary but a co-channel interferer to CEPT-plan compliant terminals.

O2 believes that the presence of TDD users in and adjacent to the top end of the band (the CEPT FDD DL part) will place additional, very significant, constraints on FDD users, that will not be present in other Member States where the CEPT band plan is fully adhered to. The prospect of having high power TDD base station equipment at the top end of the band blocking CEPT-plan compliant mobile stations, by effectively operating co-channel, is a very significant factor and this has not been taken into account by Ofcom. Ofcom's consultants admit (Technical Report §5.2.1) that *"it is difficult to fully mitigate the effects of TDD systems causing blocking in the FDD downlink band without introducing 'non-standard' FDD mobile equipment with a reduced receive band."* There will also be an effect from TDD operation in the centre block (the FDD duplex gap), and we note Ofcom's consultants uncertainty in regard to the size of guard band (or other mechanisms) needed to mitigate this effect fully (Technical Report §5.2.3).

This effectively means that FDD equipment mass produced in line with the CEPT Decision will not be useable in the UK. Consequently, operators with a preference for low unit cost CPE, or wish to offer a roaming service to continental users, will wish to avoid ending up with the top end of the 2.6GHz band used for TDD following the auction. For operators with an international footprint this spectrum would, effectively, become worthless if the TDD part of the 2.6GHz band is extended into the top (FDD DL) part.

This problem is compounded because the bidder does not know when this devaluation of its target lot is going to take place. When the clock part of the auction begins bidders are bidding against a band plan which does not have TDD at the top, maintaining the value of the upper FDD segment in the bidders eyes. As bidding continues the auction may suddenly alter the band plan – thereby significantly devaluing the upper FDD lots.

Ofcom's recent discussion document on the auction design for L-Band,[90] highlights how, in that case, categories of lots cannot be determined because

> *"there are significant differences between available lots and it is not possible to identify subsets of lots that are sufficiently close substitutes to be treated as categories"*

O2 believes that:

a) Out-of-band interference means that the upper pairs of 2500-2690MHz are not sufficiently substitutable for the lower pairs for them to constitute the same category of lot, even if Ofcom sticks to the CEPT band plan; and

b) The ability for TDD to suddenly appear at the top of the 2600MHz band dramatically weakens the underlying assumption of substitutability within the FDD lots and, in fact, means that bidders' valuations may be invalidated part way through the auction.

The academic literature[91] is very clear that clock-proxy auctions only work well when they are concerned with substitutes. The lack of substitutability and the ability of that substitutability to diminish under certain conditions, creates a massive exposure problem for FDD bidders. This does not apply to TDD bidders and is, consequently, discriminatory.

O2 believes that Ofcom must therefore revisit its auction design and re-consult on this matter, as it has for L-Band.

Question 16: Do you agree with Ofcom proposals to award the 2290 MHz band through a second price sealed bid auction?

O2 does not favour sealed bid auctions (from an efficiency perspective), but if Ofcom believes there is little value in this spectrum a second price sealed bid auction may be a proportionate use of Ofcom's resources.

[90] http://www.ofcom.org.uk/consult/condocs/1452design/1452design.pdf §2.12

[91] For example, "*The Clock-Proxy Auction : A Practical Combinatorial Auction Design*"; Ausubel, Crampton and Milgrom 2004

Spectrum Usage Rights

Question 17: Do you have a preference for either of the two approaches to specifying technical licence conditions?

As a prospective licensee that expects to use an interference resilient technology, O2 has a preference for the transmitter spectrum mask approach.

The Spectrum Usage Rights (SUR) parameters provided in the consultation are calculated based on "typical" network deployments for "typical" technologies that Ofcom expect to be used by licensees. The final SUR parameters selected by Ofcom for inclusion in the technical licence conditions will, in our view, have to be based on the least interference resilient technology that a prospective licensee wishes to use. We would expect respondents that anticipate using a less interference resilient technology than the example technology selected by Ofcom to illustrate the SUR options in the Spectrum Bands to seek a relaxation in the SUR parameters to ensure that they are able to deploy their preferred technology. This leads to a conflict with Ofcom's principles of technology neutrality. On the other hand, a selection of SUR parameters that yields less in-band interference from neighbouring licensees, because it is based on more interference resilient technologies, will lead to prospective licensees such as O2 being able to plan our networks to lower acceptable received power levels, widening the range of options for deployment, and ultimately reducing network deployment costs.

The difficulty of trying to find a technology neutral approach to SUR parameter definition is highlighted in §§9.97-100 of the consultation, where Ofcom itself offers two alternative approaches to the definition of SUR parameters for the 2300MHz band, namely parameters based on an assumption that TDD services will be used, and one that assumes PMSE use of the band. Tables 26 and 27 offer two different sets of in-band and out-of-band Power Flux Density limits – but it is not clear which one will be used. In particular, it is not clear whether Ofcom will require the successful licensee to declare their intended application or technology before having their licences issued, or whether it will arbitrarily choose one of the options offered.

Question 18: Do you have any comments on the transmitter spectrum masks defined below?

As noted above, we are content that Ofcom's proposals for restricting the power levels permitted in the adjacent block and modifying the standard out-of-band emission masks would protect the adjacent and second adjacent channels at FDD/TDD and TDD/TDD boundaries. We again note that these additional restrictions above standard values are applied to base stations only, to ensure that standard mobile terminals can be deployed, thus maximising the economy of scale benefits from the use of standard European terminals.

Question 19: Do you have any comments on the SUR parameters defined below?

See above.

Question 20: Do you have any comments on the SUR methodology and assumptions detailed in this annex?

We make no comment on the SUR methodology and assumptions defined in Annex 11, other than noting, as discussed above, that a technology neutral award based on SURs

needs to be predicated on technology assumptions. Depending on those assumptions, prospective licensees will either safeguard their use of the spectrum (if they plan to use the least interference resilient technology) or will increase network deployment costs if they have to pay to safeguard their neighbours' use of less resilient technologies (if they plan to use a more interference resilient technology).

Question 21: Do you have any comments on the use of the Visualyse tool as described, on the assumptions or the propagation model proposed in this annex?

We make no comment on the use of the Visualyse tool.

Question 22: Do you have any comments on the assumptions detailed in this annex?

See above.

ANNEX A Excerpts from Oxera's Study for O2 on the Competitive Impacts of Competition on Asymmetric Licence terms and Conditions

[✂……..]

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ANNEX B [✂…..]

ANNEX C Auction of Danish 3G licence Evaluation Report – NITA January 2006

In January 2006, NITA published an evaluation report on its auctioning of a 3G core band licence, which is a direct substitute for the existing 3G licences in the Danish market. O2 notes that Ofcom is proposing to auction 2010MHz spectrum which is a direct substitute for that owned by O2 and that Ofcom considers 2600MHz a substitute for the 3G core band spectrum. Therefore the two cases are comparable.

NITA discloses its legal advice at footnote 2 on p.6 of the report, where it says *"legal considerations do not require that a new licence holder should be treated as the existing 3G licence holders*", however all substitute assignments should be subject to the same tests as defined in the Authorisation Directive.

At §11 of the report NITA outlines its approach to determining the licence terms and conditions for the new 3G licence:

> *"a general policy is that the licence should impose only the minimum restrictions necessary to promote policy objectives. The 3G lcience features a series of licence terms relating to technology restrictions, licence duration, coverage obligations and licence payment. The approach taken to establishing the licence terms for the new 3G licences was to consider the terms set for the existing 3G licences and assess whether it was appropriate to make any changes. DotEcon and Analysys undertook an extensive analysis of the scope for changing aspects of each of these terms…"*

Two particular conclusions of DotEcon and Analysys are of interest, firstly in relation to licence duration:

> *"The licence duration was reduced from 20 years, as specified in the licences auctioned in 2001, to just under 16 years in order to synchronise the expiry date with the expiry of the existing 3G licences (31 October 2021). A common expiry date desirable from a frequency management perspective as it should help maximise the future economic benefits that could be derived from the use of the spectrum. Synchronisation also avoids potential competition issues in the downstream market, which theoretically could result from the new licensee being the only party that might be left in the market after other licences have expired. Additionally, the market analysis undertaken by DotEcon and Analysys indicated that the shorter duration should not fundamentally affect interest in acquiring the spectrum."*

Secondly in relation to rollout obligations:

> *"The coverage obligations were maintained to be the same as the obligations in the existing 3G licences, but staggered to reflect the later licence award, i.e. 30% population coverage by 19 February 2009 and 80% population coverage by 19 February 2013. The market assessment undertaken by DotEcon and Analysys did not identify any benefits to competition from removing the thresholds or changing the timescale. Network rollout by a serious operator would more likely be driven by commercial pressure."*

NITA summarises it's position on licence terms and conditions as:

> *"…terms were generally based on the same terms as the 2001 licences, thereby ensuring equitable and fair treatment of the new licensee in respect to the existing 3G operators. The principal adjustment to the licence terms was to the licence duration,*

> *which was shortened so the new licence would expire at the same date as the existing 3G licences. This should facilitate future spectrum management and help to ensure that future long-term benefits derived from the use of this spectrum (post 2021) are maximised."* [emphasis added]

In relation to licence duration, NITA appears to disagree with Ofcom in that NITA's concern is that it, at the time of the auction, ensures that it does not create a spectrum management headache for itself in the future by aligning the termination dates of all 3G licences in the market. By contrast Ofcom has proposed that at least three classes of mobile spectrum licences will be prevalent in the UK market[92]:

- the new model indefinite licences at 2600MHz
- the finite duration licences of the five MNOs at 2100MHz; and
- the indefinite licences of four MNOs for GSM services, which are (theoretically) subject to less security of tenure than the licences above.

In light of NITA's comments in its evaluation report, O2 believes that Ofcom needs to re-evaluate its proposals for the Spectrum Bands in relation to their compatibility with its statutory duties and inparticular its duties as a spectrum manager[93].

In relation to coverage obligations, DotEcon/Analysys' advice to NITA and Ofcom's position as described at §6.137 of the consultation appear to address this issue from different perspectives.

In relation to NITA's award, O2 understands that DotEcon/Analysys suggest that competition in the mobile market would not be further enhanced by allowing entry by the new player in asymmetric terms – so fairness (see final quote above) would dictate that such a player should be subject to the same burdens as the incumbents. O2 agrees with this analysis, as Oxera's work has shown that competition would be distorted and harmed by entry on asymmetric terms (ie not enhanced).

[92] §6.113(a)
[93] s(2)(a) of the Communications Act 2003, for example.

ANNEX D WiMAX solutions are market ready and will compete with 3G

At §6.38 of the consultation, Ofcom provides a snapshot of the rapidly developing WiMAX solutions market:

"In response to these technology developments, several stakeholders have recently announced their commitment to new technologies designed to be used in the 2.6 GHz band. Some examples of corresponding press releases came from:

a) operators in large mature markets

- *in July and September 2006, US operator Clearwire reported large investments from Motorola and Intel to develop WiMAX offerings; and*
- *US operator Sprint Nextel stated its commitment to invest significantly in the development of a WiMAX network using the 2.6 GHz band, in partnership with Motorola, Intel and Samsung, by the end of 2008; and*

b) important manufacturers active in markets worldwide

- *in October 2006, Nokia reported the planned commercial availability, for the 2.6 GHz band, of WiMAX base stations at the end of 2007 and of WiMAX-capable mobile devices in 2008; and*
- *in October 2006, Nortel announced the introduction of a WiMAX equipment portfolio based on specific developments of WiMAX technologies."*

Since Ofcom published its consultation, announcements at 3GSM have quantified the scale of this investment.

- Sprint Nextel's investment in mobile WiMAX at 2.5GHz will be over US$1.1bn in 2007 alone;
- Motorola will offer both single- and multi-mode devices, as well as playing a major role in Sprint Nextel infrastructure rollout, it showcased its first handset and data card solutions at 3GSM. These will be in full production in 2008;
- Nokia has been named a key infrastructure and consumer electronic device supplier to Spring Nextel;
- Samsung will be a primary infrastructure provider for Sprint Nextel and will also deliver dual-mode devices.
- LG Electronics intends to develop an infotainment device.
- Perhaps most importantly, Intel will deliver WiMAX solutions for Centrino Mobile Technology and next generation computing devices.

Ofcom's hasty decision to bring 2.6GHz to market in the UK is in part because *"in the UK the 2.6 GHz band is potentially the only band where mobile WiMAX could be used with certainty in the UK for the foreseeable future"*[94]

Ofcom must, therefore, itself see a high likelihood that mobile broadband solutions using WiMAX will be able to compete directly with the 3G MNOs in 2007/8 – otherwise, why the rush to bring this spectrum to market?

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[94] §6.41(b) of the Consultation.