



# Coexistence of new services in the 800 MHz band with digital terrestrial television

## Response by Vodafone to the Ofcom consultation

11 August 2011

### 1 Introduction

This consultation is a step by Ofcom towards the implementation of the Ministerial Direction to Ofcom<sup>1</sup> for the auction of licences for the 800 MHz band; it starts the development of the approach to be used in the UK to manage coexistence of new services in the 800 MHz band with digital terrestrial television<sup>2</sup>. The purposes of the auction are described in the Direction:

The Secretary of State gives these directions for the purposes of: ensuring the release of additional electromagnetic spectrum for use by providers of next generation wireless mobile broadband; allowing early deployment and maximising the coverage of those services; creating greater investment certainty for operators  
*[rest of paragraph not applicable to 800 MHz band]*

Ofcom's proposals in the consultation could frustrate the achievement of these objectives; in particular, the proposed tariff mechanism for funding of MitCo will become very complicated once developed, which could lead to delay. It could also discourage coverage of less populated areas.

In this response, Vodafone proposes an alternative funding mechanism based on a single up-front payment. We believe that this will more fully deliver the objectives of the Ministerial Direction.

### 2 Summary of Vodafone's comments

#### The results of studies undertaken or commissioned by Ofcom.

These studies over-estimate the number of households potentially affected, because TV receivers have a wide range of performance whereas the studies are biased towards the worst performing TV receivers.

#### The mitigation measures to prevent this.

Ofcom has identified all of the key mitigation measures. However, it has assessed them separately rather than as elements in an overall solution, which has led to Ofcom over-estimating the number of households that might need a change of TV platform.

#### The proposal for a single body "MitCo" to manage the process.

Vodafone agrees with Ofcom that the 'hybrid approach' is best, with responsibilities shared between MitCo and the licence holders. However, Ofcom's specific proposals are unduly complex and bureaucratic; this is likely to lead to delays in both the licence award and the roll-out of networks.

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<sup>1</sup> SI 2010 No. 3024; The Wireless Telegraphy Act 2006 (Directions to OFCOM) Order 2010

<sup>2</sup> This topic was previously considered in the consultation of June 2008, but Ofcom's thinking has changed substantially in the intervening period.

### The funding arrangements for MitCo.

Ofcom's proposal for a 'tariff' is effectively a tax that will discourage network rollout in less populated areas. Vodafone proposes that MitCo should be funded by up-front payment before network rollout commences. This can be structured to provide incentives for roll-out and to minimise disruption to TV customers.

Ofcom's cost estimates are, on balance, conservative, and provide a sound and prudent basis for the funding of MitCo.

### Provisional proposals for technical licence conditions (TLCs)

These proposals are even more restrictive than those proposed in the parallel Ofcom consultation on technical licence conditions<sup>3</sup>. Vodafone believes that they are not proportionate, and seem not to be in accordance with Commission Decision 2010/267/EU.

## **3 Response to specific questions**

### **1: Do you have any comments on our modelling approach and assessment of numbers of households affected?**

#### The modelling approach

The approach for modelling needs to be developed to provide answers on matters needed for the development of policy. Any modelling requires assumptions to be made, and each of the assumptions is subject to a margin of uncertainty. Ofcom has undertaken modelling work for the release of the digital dividend<sup>4</sup> that is far more sophisticated than any other European regulator has found necessary, and therefore also far more complex. This modelling work is more than adequate to inform the policy decisions that need to be made, given the inevitable uncertainties in predictions of the future.

If Ofcom finds for its future policy development that it needs further modelling work, this would probably be an indication that the policy being contemplated is not robust against the inevitable uncertainties.

#### Assessment of numbers of affected households

Ofcom has concluded that "the numbers presented are towards the upper range of estimates", because "we have used the worst performance contour of the tested DTT receivers as the basis for our analysis". Given that receiver performance has a spread of several tens of dB, this is a very pessimistic assumption indeed, and would result in numbers that are **above** the upper range of expectations. It might be argued that a few of the other assumptions are optimistic, but these are very unlikely to outweigh the pessimism of the assumption for receiver performance.

As Ofcom will be aware, Vodafone is already rolling out an 800MHz network in Germany, following the licence award in May 2010, with many hundreds of base stations already deployed. It is difficult to draw direct comparisons with UK (because of the areas of rollout and the differences in DTT usage), but the very small number of interference cases to date suggests that Ofcom's assessment will turn out to be a significant over-estimate.

We therefore expect that the number of potential interference cases to be lower than Ofcom's estimates. Therefore, as MitCo gains experience with network rollout it will be able to reduce the number of households that it will need to assess for each base station deployment. The

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<sup>3</sup> Consultation and information on technical licence conditions for 800 MHz and 2.6 GHz spectrum and related matters; 2<sup>nd</sup> June 2011

<sup>4</sup> Technical analysis of interference from mobile network base stations in the 800 MHz band to digital terrestrial television; Ofcom; 10 June 2011

cost estimates that Ofcom has derived from its analysis therefore provide a safe and prudent basis for the funding of MitCo.

## **2: Do you agree with our high level conclusions on mitigation options?**

Ofcom has identified all of the main mitigation options, but it has undervalued the contribution that can be made by on-channel repeaters and improvements to DTT equipment (a ‘decision tree’ of the order in which mitigation measures are considered would be helpful). These together are likely to reduce substantially the number of platform changes that might be needed.

Ofcom’s analysis has shown that MitCo will have a large enough ‘toolkit’ of mitigation measures to enable it to deliver the interference mitigation that will be needed. However, it is not the role of Ofcom to specify which mitigation measure(s) will be used to address particular situations.

It is important to note that most of the mitigation techniques will only be needed in certain areas of the UK, because DTT receive filters will provide an almost complete solution in areas where channels 58-60 are not used for DTT multiplexes.

### DTT receiver filters

DTT receiver filtering will be the most important ‘first line’ technique for interference mitigation, especially in areas where the top few TV channels are not used.

Ofcom’s analysis has been based on the performance of filters that have been designed using ‘off the shelf’ components. The quantity of filters that Ofcom estimates will be needed would justify the development of custom components with improved performance (in particular, high-Q resonators using acoustic wave technology). These components would improve the performance of the filters for domestic installations, and reduce the cost for communal antenna systems.

### Base station transmit filtering

Ofcom has significantly under-estimated the impact of this option. It has only considered the incremental cost of filters, because it has assumed that a higher quality filter can be readily substituted in the base station. However, this assumption is not generally correct. The size of base stations is reducing, as ever more equipment needs to be fitted into the existing cabin/building. They are also becoming increasingly integrated. The transmit filter is often not a physically separate component, and there is usually no space to fit a larger one. It may therefore not be possible to fit replacement filters in many models of base station.

Please see section 4 of this response for the comments on the “provisional proposals for additional mitigation in certain geographic areas” in Table 6.3 of the consultation. See the Vodafone response to the consultation on TLCs for the comments on the proposals in that consultation.

Ofcom is correct to observe that the emissions below 790MHz will be lower for base stations in the upper blocks. This can be taken into account in Vodafone’s proposal for funding of MitCo (see our response to question 4), and does not need to be specified in licences.

Comment on the Technical Report: It appears that Ofcom’s analysis<sup>5</sup> assumes that the improvement in ACLR is equal to the extra filter attenuation at the centre of the channel; this is not a valid assumption.

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<sup>5</sup> Ofcom technical analysis<sup>4</sup>, paras. 6.50 – 6.64.

### Improvements or adjustments to DTT equipment

Ofcom has found a “wide range of TV receiver behaviour”, and its assessment is “biased towards the worst performing TV receivers”<sup>6</sup>. The range of receiver performance is comparable to the stop-band rejection of the consumer filters that Ofcom has used as a reference. Therefore, replacing a poor receiver with a good one will provide a similar degree of mitigation to a filter. If both are implemented, the benefit is cumulative.

This option will be feasible at least for TV reception systems where the current receiver is a set top box; it would be cheaper than a platform change, and would probably be less disruptive for consumers.

Another case where improvements to the reception system may be particularly beneficial is the adjustment or replacement of indoor distribution amplifiers that have excessive gain or inadequate strong signal handling.

### Re-orientation of DTT aerials

The major benefit of re-orientation of DTT aerials is to receive DTT signals on lower channels from a different transmitter, which will allow a DTT filter to be used – the filter will provide more mitigation than the best case angular discrimination of an antenna. It is therefore likely to be most useful in geographic areas in which channels 59 or 60 are used.

This option would be quite disruptive to consumers, because it would require ladder access to the rooftop and access into the house, and it would be quite expensive. It might also result in consumers receiving local TV programmes for a different region.

It would therefore be helpful to stakeholders if Ofcom could provide an estimate of the number of households that receive signals on channels 59 and 60 that can receive an acceptable DTT signal from another transmitter, and the proportion of these that are in the same region for local TV.

### On-channel repeaters (OCRs)

We are pleased to learn that single channel OCRs have been shown to work. However, it is difficult to reconcile this finding with the statement in the consultation document that “the technical efficiency of OCRs is uncertain”:

- A multiple channel OCR can be implemented as a set of single channel OCRs, and there is no reason to doubt that this would work.
- The attenuators would only be needed in a small proportion of the households closest to the base station, which are therefore easy to identify. As the attenuator would be fitted in the same place in a TV reception system as a filter would be, there is no reason to suppose that that this could be any more difficult to manage than filters.
- There is no reason to suppose that multiple OCRs would cause any problems of mutual interference, because the small areas that they are intended to cover would be well separated.

Deployment of an OCR would have less impact on consumers than using filters; there would only need to be interaction with consumers that might require an attenuator, which will be a smaller number than might otherwise require a filter. It therefore seems premature for Ofcom to conclude (even provisionally) that “OCRs will not form a key part of the proposed mitigation measures”.

OCRs are similar in transmit power and purpose to ‘self-help TV relays’. In a statement in June 2007<sup>7</sup> Ofcom decided that self-help relays for DTT would be licensed directly by Ofcom,

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<sup>6</sup> Ofcom Technical analysis<sup>4</sup>, para, 1.12 4

<sup>7</sup> Self-help TV relays and Digital Switchover: Statement following consultation; 14 June 2007

and the same approach would be appropriate for OCRs for interference mitigation<sup>8</sup>. We therefore suggest that the licensing of OCRs should be included in the 800MHz licence.

#### Opposite to DTT polarisation

We agree with Ofcom that this technique is only applicable in certain circumstances – that is, on sites that already have two physically separated antennas per sector (i.e. spatial diversity).

Mobile basestations use two antennas per sector for reception (receive diversity), and for LTE also for transmission (MIMO). These antennas can either be physically separated (spatial diversity) or in the same enclosure but with different polarisation (polarisation diversity). It is not possible to use ‘opposite to DTT polarisation’ when polarisation diversity is used. In most cases, it is very difficult to add new antennas to existing base station masts, so ‘opposite to DTT polarisation’ is only feasible on masts where spatial diversity is used. This is usually on larger lattice masts, which tend to be further away from houses.

It should be noted that the power received by a TV reception antenna from an LTE base station with 2-antenna MIMO transmission will be 3dB below a single co-polar antenna, for the same overall EIRP.

#### Base station power reductions

The potential of the 800MHz spectrum for coverage over long distances and penetration into buildings can only be fulfilled if there is adequate base station transmit power. Even a small reduction in power results in a sizeable reduction in coverage (1dB power reduction equates to 14% less coverage area). It is not practicable to deploy base stations for 800MHz at different locations to other bands, so in practice this will result in a worse customer experience for mobile broadband in any areas where base station powers are required to be reduced.

As Ofcom notes, there is a trade-off between in-block emissions levels and complexity of other mitigation techniques. There may be circumstances in which a reduction in base station power will be the most cost-effective mitigation technique, but we believe that these will be rare.

It is therefore **not** proportionate for Ofcom to mandate **any** base station power reductions through licence conditions.

#### Platform changes

A small number of platform changes may be needed, but we believe that the number will be substantially less than Ofcom’s estimates:

- Ofcom’s assessment has used a cautious approach, biased towards the worst-performing receivers. Therefore, there is an intermediate step of providing a receiver with improved performance (probably a set top box) before needing to consider a platform change.
- The performance of new TV receivers is expected to improve, now that the TV set manufacturers are aware of the licensing of the 800MHz band. A significant proportion of TV sets and set top boxes will have been replaced by the time that 800 MHz networks are deployed.
- Ofcom’s estimates do not take into account the potential benefit of OCRs.
- Ofcom has only considered a single solution for each mitigation measure. However, it may be cost effective to consider a wider range of mitigation measures before proceeding with a platform change. In particular, Ofcom’s cost estimate for a filter for communal aerial system is lower than for a platform change, but it has not considered using such a filter in cases where a platform change would otherwise be needed for a standard domestic installation.

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<sup>8</sup> As the OCRs are “on-channel”, there would not be any need for frequency planning.

Ofcom's cost estimates for individual platform changes are likely to be high, because they are based on retail prices and do not take into account cost trends.

#### Other bespoke mitigation measures

By their nature, it is difficult to make general comments about bespoke measures.

In some cases, installing additional DTT relays could be cost effective for multiplexes that are transmitted by main stations on channels 59 and 60. DCMS is currently consulting on local television<sup>9</sup>. If the proposals in this consultation document come to fruition, this would open the possibility of co-siting additional DTT relays with the local TV transmitters, using a second interleaved channel to re-transmit the signals from the highest DTT multiplex. For example, Ofcom has estimated that a transmitter covering Manchester using an interleaved channel would serve around 600,000 households using 64-QAM modulation<sup>10</sup>.

#### **3: Do you have any comments, views or evidence that you would wish to be considered in our further work looking at the appropriate level of consumer support?**

If MitCo is established as an independent organisation to manage consumer support and interference mitigation, it would not be appropriate for Ofcom to specify in detail how it goes about its business. Rather, Ofcom should set performance targets for the outcomes that it wishes to see achieved. This will allow MitCo to refine its processes as it gains experience through the network deployments.

We understand that Ofcom is proposing in this consultation that MitCo will be responsible for preventing or remedying cases of interference when an outdoor reception antenna is used (although this does not appear to be explicitly stated in the consultation document). This is appropriate, given that the UK DTT plan is only designed to provide reliable DTT reception when a rooftop antenna is used. However, many TV sets use indoor antennas; some of these may also be subject to interference, and consumers will require assistance to remedy it.

We therefore suggest that MitCo should be responsible for providing all consumer information and advice for indoor and outdoor reception, but that consumers should be responsible for mitigation measures for indoor reception (in most cases, this would consist of a DTT receiver filter, which could be supplied by mail order).

Ofcom should consider sponsoring a voluntary certification scheme, akin to the 'digital tick', for DTT reception equipment with an appropriate level of immunity to interference, and for retailers who supply any necessary DTT reception filters at the time of purchase and provide suitable training to staff.

Some new potential interference cases may arise after network roll-out, for example due to people moving house or new house construction. In these cases, MitCo should provide information and advice, but consumers or aerial installers should be responsible for any mitigation measures that are needed.

It is likely that MitCo will end up providing advice for TV reception problems that are unrelated to the digital dividend, and which would previously have been handled by Ofcom or broadcasters. It would be appropriate for MitCo to be reimbursed for this work.

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<sup>9</sup> A new framework for local TV in the UK; Department for Culture, Media and Sport; July 2011.

<sup>10</sup> Award of licences in the frequency bands 542 to 550 MHz and 758 to 766 MHz covering Cardiff and Manchester; Information Memorandum; 29 October 2008 (Table 2.9).

**4: Do you have any comments or views on how we have assessed the approaches and our preference for the hybrid approach?**

We agree with Ofcom that **a** hybrid approach is best. However, the particular hybrid approach proposed by Ofcom in section 6 (and implicitly assumed in other proposals elsewhere in the consultation) is **not** the optimum way to deliver the implementation of mitigation measures.

MitCo should be funded by a single up-front payment from each licence holder

Vodafone believes that the best funding model is a single up-front payment, defined prior to the auction and payable soon after it. The total of the payments would cover the full anticipated cost of Mitco fulfilling its responsibilities, on the assumption that most of the mitigation would be undertaken by MitCo. As a licence holder deploys its network, it could choose to implement network-based mitigation features, and it would then receive a rebate from MitCo equivalent to its resulting cost saving. This ensures that operators have a direct financial incentive to implement those mitigation measures that are cost-effective.

A single up-front payment has many significant benefits:

- It is simple to calculate (the information in this consultation document and in the studies published by Ofcom contain sufficient data to do this).
- It makes the calculation of the start-up costs for MitCo less critical, and provides certainty for MitCo in the start-up period.
- Any uncertainties over the costs of mitigation in certain areas of the UK would tend to average out.
- It provides certainty to bidders in the auction.
- It encourages network deployment by licence holders.
- The rebate mechanism aligns the incentives of MitCo and licence holders for implementation of network-based mitigation measures.
- MitCo will have the funding to deploy measures that provide mitigation for all mobile networks when the first operator wishes to roll out in a particular area.
- The work of MitCo would not be disrupted by any disputes over the 'rate card' for mitigation measures, because these would only affect the rebate.

A tariff-based funding mechanism has some serious disadvantages:

- It acts as a tax on base stations, which will discourage deployment in less populated areas.
- The cost of mitigation is concentrated in parts of the UK where channels 58-60 are used. The tariff would need to reflect this (otherwise MitCo would be under-funded if roll-out started in these areas), and would therefore inherently be complicated.
- The complexity of the tariff creates a risk of disputes (for example, if any of the parameters for the calculation of tariff are not precisely defined). These could delay network rollout, because MitCo could not deploy mitigation techniques without funding.
- It will take some time to develop the tariff formula and consult on it (and the less time spent on this, the greater the risk of subsequent disputes).
- Ofcom would also need to calculate the start-up costs for MitCo (i.e the costs incurred before tariff payments start).
  - This would include things like recruitment, premises, placing contracts for filters etc
  - It is dependent on the timescale in which operators can roll out their network.

- It would also be dependent on the timing of the auction, because this affects the time before mobile network deployment can start in areas where DTT transmitter re-engineering is not yet completed.
- MitCo will have fixed overheads, and it is not clear how these will be treated.
- It is unclear how the tariff mechanism would work if operators decide to roll out in different geographic areas. For example, if the operator with block C decided to roll out, then MitCo would only have the funding for mitigating the interference from this network. It would then have the choice of:
  - deploying mitigation suitable for all of the operators' networks without the funding to do so.
  - needing to return to householders with a second (or even third) DTT receiver filter when other networks are deployed in the same area.

The up-front fee should be a fixed amount per 2 X 5 MHz lot

A single, fixed, up-front fee will provide the greatest certainty for both MitCo and licence holders, and therefore for consumers of DTT reception and mobile broadband. The total cost of mitigation does not vary much with the number of licences, so a fee per block will provide greater certainty of funding for MitCo than a fee per licence.

If the licence award process is efficient, the relative size of the fees for different blocks will not affect the outcome of the auction, to either individual bidders or the exchequer.

Operators should receive a rebate from MitCo that reflects the cost savings to MitCo from network-based mitigation implemented by the operator.

MitCo is not itself able to specify options for a licence holder's base station equipment, or implement modifications to the cell site installation. There will therefore need to be a mechanism for MitCo to provide funding to the licence holder to make these changes, when they are cost-effective. The proposed rebate achieves this in an economically efficient manner:

- (i) MitCo offers a rebate to the licence holder, using a 'rate card' or simple formula. The rebate would equate to the saving of its costs through the implementation of a network-based mitigation measure (probably on a per-base station basis).
- (ii) The network operator has an incentive to agree to implement the mitigation measure if its costs are lower than the saving to MitCo.

If several operators implement network-based mitigation, the cost saving is not completely cumulative. A formula to apportion MitCo's savings between licence holders will therefore be required. This can be agreed by MitCo and the licence holders after the auction (it is not needed in order for network deployment to commence, but licence holders would not receive rebates until it had been agreed).

The rebate mechanism obviates the need for more stringent technical licence conditions (as provisionally proposed in paras. 6.57 – 6.64 of the consultation document); licence holders will have the incentive to meet tighter emissions limits when they are cost effective, and Ofcom should not mandate them when they are not cost effective.

Vodafone has a preference for generic lots and equal fees per lot

Vodafone has a broad preference for generic 800 lots. These have a number of advantages, including simplicity and efficiency of auction design. For the lots to be generic, the up-front payment should be equal for each lot, otherwise it will introduce bidder uncertainty in the principal stage about the payment required, and the outcome of the auction could become less efficient.

If, however, Ofcom decides to apply a different fee for certain blocks, then it will need to implement several sub-categories of 800 MHz lot or individual lots, leading to a more complex auction design. It might be desired to relate the fee for a block to the contribution that it makes to the total cost of mitigation (and therefore to the size of the potential rebate). However, there is no need for the ratio to be exact in order to ensure an efficient outcome; a factor of two for the lower two blocks would seem to be adequate, if different fees were used. Different fees would also create a risk of demand distortions in the opening bid rounds; Ofcom should simply remove that risk by reflecting these fee differences in the reserve prices.

#### Period of operation of MitCo

The provisions for the establishment of MitCo also need to address its winding up, once its task is accomplished. The date proposed by Ofcom for the 800MHz coverage obligation (the end of 2017) would also be suitable for this purpose; any further network deployment after that date would be local, and could be managed by each operator on a case-by-case basis.

See section 7 of this response for comments on the future work of Ofcom as set out in para. 6.47.

#### **5: Do you agree with the options, the assessment approach and our initial conclusions? What are your views on cost risks and how to deal with them?**

The assessment approach has overlooked one very important risk – the risk of delay. Ofcom has already identified that “the more complex the tariff mechanism is, the more challenging it is likely to be and make accurate”. A trend in this direction is already evident in this consultation, and this would be likely to continue if Ofcom chooses to develop the tariff model further.

We would therefore encourage Ofcom to consider Vodafone’s proposal for MitCo to be funded by up-front payments by the licence holders. A single payment reduces cost risk, because many of the uncertainties will average out over the UK. This proposal is described in our response to question 4.

We agree with Ofcom that licensees should not be responsible for cost uncertainties that are beyond their control (para. 6.50).

It is unclear from this consultation which party (licence holder or MitCo) Ofcom believes will be ultimately responsible for ensuring that the commitments for interference mitigation are fulfilled. It is therefore important to consider carefully the governance model for MitCo, so that the following objectives can be achieved most efficiently:

- consumers need to continue to receive television services
- the model should encourage network deployment by licence holders, especially in less populated areas
- The pace of deployment should not be held back by the inability of Mitco to fulfil its responsibilities

It is important that Ofcom addresses this in the next consultation.

## **4 The Ministerial Direction**

In this section, we consider how well the proposals in the consultation and the alternatives in this response fulfil the purposes set out in the Ministerial Direction.

#### Ensuring the release of additional electromagnetic spectrum for use by providers of next generation wireless mobile broadband

The proposals in this consultation do not directly bear on this purpose.

### Allowing early deployment

A tariff mechanism will inevitably be complex and take time to develop, which could delay the auction. The complexity is also likely to lead to ambiguities, which could delay network deployment while they are resolved (base stations cannot be turned on until the mitigation measures are in place). See our response to question 5. On the other hand, Ofcom has already undertaken all of the analysis needed to determine a single up-front payment.

It is important that MitCo does not delay network roll-out due to inability to deploy mitigation measures in a timely manner. This needs to be reflected in its terms of reference, governance and funding.

### Maximising the coverage

The proposed tariff mechanism for funding of MitCo acts as a tax on base stations, which will discourage deployment in less populated areas. It will particularly discourage deployment in areas where TV channels 58-60 will be used, because the tariff would be substantially higher in those areas.

On the other hand, a single up-front payment with a rebate will encourage deployment and coverage.

### Creating greater investment certainty for operators

A single up-front payment creates greater certainty to operators than a tariff that depends on future decisions on roll-out.

Ofcom will find that the tariff will depend on the number of licence holders that roll out in a particular area, and the investment needed by one operator would therefore depend on the roll-out plans of others.

## **5 Comments on the proposed technical licence conditions**

Section 6 of the consultation document contains provisional proposals for technical licence conditions for base stations. These are in addition to the conditions defined in the parallel consultation on technical licence conditions for this band. There is no specific question on this aspect of the consultation document and it is not addressed in the executive summary; some stakeholders may therefore not be aware of the relevance of this consultation to their business.

Section 3 of the consultation document addresses the legal framework, but does not mention Commission Decision 2010/267/EU on the 800MHz band<sup>11</sup>. This is a significant omission, because this Decision sets out obligations of Member States in relation to technical licence conditions.

Paragraphs 6.62 and 6.63 both refer to restrictions that Ofcom is provisionally considering applying “in certain geographic areas”. These restrictions could have serious consequences for network deployment in the affected areas, and could even preclude the deployment of certain types of base stations or products from certain vendors.

Vodafone’s proposals for a rebate mechanism in the funding of MitCo obviates the need for including these stringent technical conditions in licences; licence holders will have the incentive to meet tighter emissions limits when they are cost effective, and Ofcom should not mandate them when they are not cost effective. See our response to question 4.

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<sup>11</sup> Commission Decision of 6 May 2010 on harmonised technical conditions of use in the 790-862 MHz frequency band for terrestrial systems capable of providing electronic communications services in the European Union(2010/267/EU)

## Emissions below 790MHz

Article 2 of the Commission Decision states:

When they designate or make available the 800 MHz band for [mobile] networks ... Member States shall do so ... ***in compliance with the parameters*** set out in the Annex to this Decision. *[our emphasis]*

The provisional proposals in Table 6.3 for out-of-block emissions are substantially more stringent than the most stringent option in this Annex (Case A in Table 4), and are therefore not in accordance with the Decision<sup>12</sup>.

However, even if Ofcom was permitted to implement the proposed emissions limits, it would still not be proportionate to do so. The technical report associated with this consultation provides estimates of the number of households affected by interference with filtering at DTT receiver and with filtering at DTT receiver and BS transmitter. Paragraph 5.45 of the consultation document provides an estimate of around £11 million for the cost of the filtering at the BS transmitter, although this appears to be a substantial under-estimate (see the response to question 2).

Cost of enhanced base station filtering	
Number of households affected by interference with Filtering at DTT receiver	47329
Number of households affected by interference with Filtering at DTT receiver & BS transmitter	30617
Number of households that benefit from Filtering BS transmitter	16712
Estimated cost of enhanced base station filtering	£11 million
Cost of enhanced base station filtering, per household that benefits	£658

This cost is nearly double Ofcom's estimate of £350 for the average cost per household of a platform change (para. 5.80), and appears to be a substantial estimate of the true cost.

## In-block emission levels

The potential of the 800MHz spectrum for coverage over long distances and penetration into buildings can only be fulfilled if there is adequate base station transmit power (1dB power reduction equates to 14% less coverage area). As Ofcom notes, there is a trade-off between in-block emissions levels and other mitigation techniques, so it is not proportionate for Ofcom to mandate one of these through licence conditions.

Whether the cost of the mitigation techniques is significant in the context of the overall funding of MitCo depends on the sizes of the power reduction and geographic area being contemplated. It is not possible to comment on this without more information.

<sup>12</sup> We note that the introduction to the annex states that "it should be understood that the derived BEMs do not always provide the required level of protection of victim services and additional mitigation techniques would need to be applied in a proportionate manner at national level in order to resolve any remaining cases of interference." However, it is clear from the context and from the use of the word 'parameters' (i.e. numeric values) in Article 2 that "additional mitigation techniques" means 'other mitigation techniques in addition to the BEM (for which there are three cases specified)'.

## **6 Representations on the impact assessment**

The statement in paragraph 2.19 is not sufficient by itself to meet the requirements of Section 7 (7) a) and b) of the Communications Act 2003, and the document as a whole does not meet the requirement of Section 7 (4) of that Act.

The whole of this consultation response constitutes representations on the impact assessment. In this section we highlight some specific matters relating to the adequacy of this assessment.

### Technical licence conditions

The consultation document states that “we provisionally consider that it may be proportionate to include licence conditions imposing further restrictions in certain geographic areas ... on the out of block emission levels” (para. 6.62). and a similar statement is made for in-block licence conditions (para. 6.63) However, there is no direct impact assessment on either point, and the data in the consultation document does not support these conclusions, even without taking into account the substantial under-estimate of the cost of implementing the conditions in base stations and network deployment.

If Ofcom does decide to proceed with these proposals, it will need to define them in some detail and provide a quantitative impact assessment in a future consultation.

### Funding of MitCo

Ofcom has not undertaken an impact assessment of different funding models for MitCo before proceeding with a particular type of tariff mechanism.

### Non-cash costs to consumers

A fundamental consideration in the assessment of mitigation measures is the impact to consumers, for which Ofcom uses the term “non-cash costs” in this consultation (e.g. para. 5.23).

Paragraph 6.32 might be understood as suggesting that Ofcom might be considering making payments to consumers for loss of service. We requested clarification from Ofcom, and we interpret Ofcom’s response<sup>1</sup> (and the absence of any impact assessment on this topic in this consultation) as indicating that this was not Ofcom’s intention. This is only one of several causes of loss of service to consumers (including planned maintenance of transmitters), and should not be treated any differently.

## **7 Next steps**

This consultation has not addressed all of the issues, and some of the proposals are still at an early stage of development. We therefore agree with Ofcom (para. 1.14) that there is a need for further consultation on coexistence issues. The large number of these policy and technical issues means that the next consultation will need to be for a period of eight or ten weeks. If Ofcom is to bring closure on these issues in a single consultation, it will need to keep its proposals simple – and we therefore urge Ofcom not to proceed with the tariff concept for the funding of MitCo.

The Ofcom consultation on the award of 800 MHz spectrum<sup>13</sup> proposed that the 800 MHz band should be packaged in six lots of 2 X 5 MHz. On the other hand, this consultation considers three blocks of 2 X 10MHz. It will obviously be necessary for Ofcom to define licence conditions (both technical and non-technical) that are consistent with the proposed lots.

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<sup>13</sup> Consultation on assessment of future mobile competition and proposals for the award of 800 MHz and 2.6 GHz spectrum and related issues; 22 March 2011

Below, we comment on the future activities described in para. 6.47 of the consultation document:

“The functions and duties of MitCo and how it is created (this may require the involvement of Government)”

- It is important that the functions of MitCo are defined in a way that encourages partnership with the licence holders. If Ofcom finds itself contemplating that MitCo might need statutory responsibilities, or Ofcom might need new ones, that will be an indication that its policy proposals are failing to achieve this objective.

“How viewers might best be communicated with and helped on an ongoing basis”

- See our response to question 3 for our comments on help and support.

“The form and parameters of the tariff mechanism”

- See our response to question 4.

“How licensees interact with MitCo regarding provision of information and coordinated timing of network rollout and activation with provision of consumer based mitigation measures”

- It is important **both** that base stations are not brought into services until mitigation measures have been implemented **and** that network rollout is not delayed by the speed of this implementation.
- It is important that the procedures for implementation of mitigation measures do not lead to commercially sensitive information about network rollout being disclosed to other licence holders.

“The circumstances under which a ‘backstop power’ to impose restrictions on network roll out or site deployment in specific cases might be exercised”

- The standard conditions of Ofcom WT Act licences<sup>14</sup> appear to include all of the backstop powers that might be required:

#### **Modification, Restriction and Closedown**

14. A person authorised by Ofcom may require the Radio Equipment or any part thereof, to be modified or restricted in use, or temporarily or permanently closed down immediately if in the opinion of the person authorised by Ofcom:

(b) the use of the Radio Equipment is, or may be, causing or contributing to undue interference to the use of other authorised radio equipment.

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<sup>14</sup> This example is taken from the template licence in Annex 1 of: Statement on variation of 2100 MHz Third Generation Mobile Wireless Telegraphy Act Licences; Ofcom; 20 June 2011

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**<sup>i</sup> Ofcom clarification on non-cash costs**

**Vodafone asked this question following the stakeholder meeting:**

The following sentences appear in para. 6.32 of the consultation document:

"Costs might, for example, include non-cash costs to consumers of dealing with the effects of interference such as the value of any temporary loss of TV services. A tariff that reflects these costs would encourage new licensees to make decisions about their network roll out that reflects these effects."

If the tariff includes an amount relating to "non-cash costs to consumers", this can only be regarded as a cost if it is paid to consumers - i.e. if the scheme for mitigating interference includes compensation to viewers. Therefore, these sentences imply that Ofcom is considering such compensation. However, there is no evidence of such costs being considered elsewhere in the consultation document, such as Table 5.7. I therefore suspect that the first of the sentences quoted above may have been inadvertently left in the consultation document from an earlier draft.

I would be grateful if you could clarify the intention of Ofcom on this matter...

**Ofcom provided the following response to stakeholders:**

The reference to non-cash costs was only intended to be an example of the types of costs that might be appropriate to be reflected in a tariff mechanism should we ultimately decide to use one. It should not be interpreted as indicating, one way or the other, a position Ofcom might adopt. We would be grateful for any comments stakeholders may have as to which costs should be reflected in a potential tariff system. It should also be noted that the consultation does not make any firm proposals as to the level of consumer support; this is explained in para 6.15.