

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

### **Virgin Media Response to Ofcom Consultation Document**

Virgin Media is pleased to respond to Ofcom's consultation document on the coexistence of new services in the 800 MHz band with digital terrestrial TV.

Within this response Virgin Media key focus is to question why Ofcom is taking a radically different approach to the issue of interference with cable TV services and interference to DTT. As Virgin Media has made clear in its response to Ofcom's earlier consultation on 800MHz issues, Virgin Media is extremely concerned that Ofcom has underestimated the likelihood of interference to cable TV services and in doing so has failed to take proper account of the interests of citizens and consumers. In particular it has failed to take account of the interests of citizens and consumers who take cable TV services. Virgin Media also wishes to raise a number of questions about how Ofcom has dealt with its calculation of the number of households who might be affected by interference to DTT.

Virgin Media's key message however is that Ofcom should pause and revisit all of its testing and modelling both for cable and for DTT to ensure that the true consequences are well understood and that it is clear who will pay for what and who will take what responsibility.

Only if this is done will all industry stakeholders and consumers be confident that Ofcom's obligations and the interests of consumers and citizens have been adequately taken into account.

### **Ofcom's Approach to Dealing with Interference to DTT is to Balance the Interests of Existing Services and New Licensees. This approach should also be taken to Cable TV Interference**

Virgin Media notes that in this consultation document Ofcom says "*many of the issues we consider require us to balance the needs of different groups of stakeholders and consumers. In this instance we want to ensure that mobile services can be used effectively in the 800MHz band but at the same time not restrict the ability of DTT broadcasting to function properly. We must consider the needs of consumers of mobile services alongside the needs of consumers of DTT services.*"

Virgin Media agrees with Ofcom's view that it must balance the needs of different groups of stakeholders. Indeed this is exactly the view that Virgin Media has taken in relation to the issue of interference to cable services. Virgin Media's view is that rather than merely balancing the needs of consumers of DTT services and consumers of mobile services, Ofcom also

needs to take into account and balance the interests of consumers of cable services with the interests of consumers of mobile services.

Ofcom's approach of balancing the needs of DTT customers with mobile customers contrasts with Ofcom's position on cable services whereby Ofcom has said that it thinks the risk of interference is "manageable" provided that Virgin Media unilaterally undertakes a number of actions that Ofcom believes could mitigate the risk of interference. As Virgin Media set out in its previous submission many of these so called mitigations would have a serious impact either on Virgin Media's operations (for example increasing the modulation which is suggested by Ofcom would reduce Virgin Media's overall network capacity by [redacted] thereby reducing the number of channels Virgin Media can carry and therefore the attractiveness of the services which it can offer to its customers. This suggestion along with other suggestions by Ofcom that Virgin Media should "turn up the level of its network" which would require considerable reengineering would have a significant financial impact on Virgin Media. [redacted]

Ofcom's suggestions that Virgin Media should bear all the responsibility of and costs of attempting to mitigate the risk of interference is in clear contrast to the position with DTT where mobile operators are required to take responsibility for and bear the costs of mitigating actions.

Virgin Media believes that this approach of requiring it to take all the responsibility for and bear the cost of all the possible mitigations is not only at odds with the approach that Ofcom should be taking under its statutory duties but is also at odds with the position that has been suggested by the European Commission. Virgin Media notes that the message has been clear from the European Commission that national administrations should deal with issues of interference not only in relation to DTT but also to cable services. As Nellie Kroes has stated "*Remaining obstacles such as interference on air or on cable TV will have to be solved; there is no doubt about that.*"<sup>1</sup>

In addition the Commission's decision which makes the spectrum available provides that "*BEMs shall be applied as an essential requirement of the technical conditions necessary to ensure coexistence between services at national level. However, 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 issues of interference.***" (emphasis added)

There is nothing in the document to restrict the victim services referred to by the Commission to DTT services. Therefore Ofcom should be prepared to take steps to ensure that appropriate steps are taken to avoid issues of interference to cable services.

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<sup>1</sup> Neelie Kroes, Monday 9 May 2011, Strasbourg

### **No Justification for Difference in Approach between Cable TV and DTT.**

In Virgin Media's view Ofcom's failure to balance the interests of new licensees and Virgin Media's existing services cannot withstand regulatory scrutiny. In the case of interference to cable services Ofcom has failed to carry out a balancing act between the new services and cable services. Rather, Ofcom has taken an overly-optimistic, and in Virgin Media's opinion not fully supported view of the Cobham test results, which leads it to a position whereby all of the responsibility for mitigating any interference falls on the cable network operator and where the new licensees of the spectrum bear no responsibility whatsoever.

Virgin Media notes that Ofcom admits in its DTT consultation that its principal duty under the *Communications Act is to further the interests of citizens in relation to communications matters and to further the interests of consumers in relevant markets, where appropriate by promoting competition* (emphasis added). They also note that they are required to secure the optimal use for wireless telegraphy of the electromagnetic spectrum. In its DTT consultation Ofcom states that "*allowing large numbers of households to face interference when there are cost effective and proportionate solutions available to reduce and fix this issue would conflict with this duty.*"

Ofcom appears to have completely disregarded the interests of consumers and citizens altogether in its discussion of interference to cable CPE. At no point does Ofcom acknowledge that interference to cable CPE will cause harm to consumers and citizens, and may cause them to incur higher costs either directly through the need to purchase new cable CPE or indirectly through increased supply costs and also through a reduction in the services that Virgin Media is able to offer to them. Similarly, Ofcom disregards the impact that requiring Virgin Media to bear the costs of all mitigating activities, and indeed the actual costs of interference when it occurs, will have on Virgin Media's ability to compete and its incentives to further invest and innovate in circumstances where its existing investments may be substantially damaged through interference from new licensees.

Given that Ofcom is taking such a dramatically different approach to cable services than it appears to be proposing to take with regard to DTT, it is difficult to see how this can be technologically neutral as between competing TV platforms. Examples of how Ofcom's approach between the two services is fundamentally different are set out below.

Ofcom's consultation states that its modelling shows that absent any mitigation up to **760,000** households could potentially be affected by DTT interference (emphasis added).

Virgin Media notes that ofcoms figure of 760,000 households is as Ofcom itself admits based on making assumptions about key parameters and that in making these assumptions Ofcom has "*generally adopted a worst case approach in our modelling. For example in modelling standard domestic*

*installations, we have used the worst performance contour of the tested DTT receivers as the basis for our analysis. We expect that the numbers presented are more towards the upper end of the range of estimates. The numbers of households affected in reality may be lower than those presented here.”*

Virgin Media notes that Ofcom’s approach of adopting the worst case approach when estimating numbers of customers who may suffer interference to DTT is completely at odds with the approach they have taken in relation to cable services where Ofcom’s approach has effectively been to take a “best case approach” and to take a what in Virgin Media’s mind is an over optimistic view of the testing carried out by Cobham.

Ofcom would request that Ofcom justify why in dealing with issues of interference to DTT, Ofcom has found it justifiable to adopt a worst case scenario approach but did not feel that it was required to take this approach when examining issues of interference to cable services.

A clear distinction between the way Ofcom has approached the issues of DTT and cable services can be seen in Ofcom’s quote above, that in modelling standard domestic installations we have used the worst performance contour of the tested DTT receivers as the basis for our analysis.

In contrast when looking at Virgin Media’s CPE, Ofcom said the following “eight of the nine STBs that CTS tested demonstrated good shielding properties from the simulated LTE user equipment at a distance of one metre.” This is despite the test results actually reading “*However 7 out of the 9 STBs tested could still suffer interference from a LTE UE handset operating at the maximum permissible transmit power of -25dBm at 1 m.*”

Virgin Media notes that as at June 2011 its networks which operate in the 860MHz frequency band number passes [redacted] homes. This is the base number therefore for households that might be affected by interference in the second half of 2013. This is considerably more houses than might potentially be affected then the 760,000 homes that Ofcom considers might be affected absent mitigation by interference to DTT.

Virgin Media also notes that Ofcom has in the case of DTT carried out both lab tests and modelling and field tests. As was made apparent at Ofcom’s workshop on coexistence issues the field tests that were carried out illustrated that Ofcom’s modelling tended to overestimate the interference to DTT.

Given that field tests can show clear differences from lab tests and modelling, Virgin Media is extremely concerned that Ofcom has not attempted to carry out any field tests in relation to cable services in order to test interference in a real life situation. Virgin Media believe this is a clear error in Ofcom’s process in dealing with issues of cable interference. Virgin Media also notes that Ofcom has failed to take account of the position of other administrations that have carried out cable testing (mostly in the lab) including the German, Dutch and Swiss administrations.

Virgin Media notes that Excentis has also carried out a study which examines the likelihood of interference to cable services. A copy of the full report is provided along with this response.

Virgin Media believes it is important to have regard to Excentis' conclusions which are *“Based on the analysis it is **very likely that a significant number of users will experience interference to their services delivered on the affected band over the HFC network.** ... The primary source of interference will most likely be the TS (terminal station). With the deployment of the new services, a transmitter (the TS) will be operating close to the end user network and CPE-equipment for HFC networks. The analysis has shown that for those LTE devices that are actively used (transmitting data) indoor a significant number (10%) will be operating at the highest transmit power allowed (23dBm). If the transmitter is close enough to the victim (in –house cable network or TV, set top box, cable modem) this is likely to result in interference problems. The required distances to avoid interference varies between different models of CPE equipment, but for some models a distance of even more than 6 m is required. About 30% of the TSs used indoor will be transmitting at high (20dBm) power. At small distances (1m) between TS and victim the chance of interference becomes very significant. The exact amount of how likely it is that interference will occur depends on the exact type and positioning of the victim (receiver).*

*If one assumes that the mobile operators will continue using the current industry practices for wireless systems and not deploy base stations with high power (maximum EIRP) at low heights, interference caused by base stations is likely to only occur in cases where the cable access network and CPE equipment are located close to the base station. The exact distance depends also on the exact location of the cable network and equipment, with the height of the “victim” network being the most important parameter. Note that typically mobile operators will use lower power and low mast heights in urban deployments.*

*CEPT report 30 suggests maximum EIRP limits for a base station. Do note that from a technical point of view, the EIRP does not determine the chance of interference, but the power density of a potential victim determines the chance of interference. This power density is influenced by many parameters of which EIRP is only one. Environment, antenna tilt, pattern and height also have a big influence. It would be even better that the EIRP itself is not specified, but the maximum power density caused by the base station at a potential “victim”. This would be from a technical point of view the only unambiguous parameter. As a first step one could limit the maximum EIRP of the base station as a function of the height of the base station.*

*If mobile operators would start deploying micro cells that are located very close to the houses and cable network, even systems with lower EIRP values may cause interference. The reason for this is that in those cases the distances will be much lower.*

*In the case that a multi dwelling unit, house or cable network is close to the antenna of the base station and at a “bad” location (based on antenna pattern and tilt) interference might also occur. Note that the power density received by the victim equipment at a certain location not only depends on the EIRP of the antenna, but also on the type of antenna (the antenna pattern) and its tilt.*

*We finally remark that if interference is caused by the base station it is likely to be constantly present. Moreover the user has no control on the signal of the base station. With regards to the interference caused by the TS, the user will only suffer from interference when the LTE device is actively transmitting.”*

Virgin Media notes that Ofcom has carried out no tests in the UK that address interference from a base station to cable services. Therefore Virgin Media finds it extremely difficult to understand how Ofcom is able to make the statement that interference is manageable given that it has no understanding of how base stations may interfere with cable services. As the Excentis report shows interference from base stations is a real possibility. Virgin Media would urge Ofcom to carry out further testing of interference to cable services both from LTE handsets and from base stations. Such interference testing should be carried out in the field. Ahead of carrying out such testing Virgin Media is unclear how Ofcom can set the maximum power levels for base stations in its accompanying consultation on technical licence conditions for 800MHz.

**Evidence from Europe Suggests Interference to Cable CPE is likely to be a real and substantial problem.**

Virgin Media refers to but will not repeat the comments that it made in its earlier submission in relation to the issues of interference. It will however point out that since that submission there has been further evidence from Europe of the fact that interference to cable CPE from services operating in the 800MHz band is likely to be a real and substantial problem.

Virgin Media notes that in the Netherlands MPs were so concerned about the possibility of interference to cable TV services that a motion was passed in parliament. The motion expressed the view that consumers must not be allowed to experience any interference to provided cable services as a consequence of the use of the 800MHz band for electronic communications and requested the Government to take care to ensure that cable operators and potential 800MHz band licence holders negotiate collective agreements before 1 July 2011 in order to avoid the chance of consumers encountering disruption to cable services due to the use of the 800MHz band. The motion also called on the Government to include a condition in 800MHz band licenses such that the minister will be able to impose obligations on license holders for the sake of preventing interference to consumer equipment used for the provision of cable service. A copy of a translation of the motion is attached at Annex 1.

As a result of the motion in parliament the cable operators and a number of mobile operators have entered into agreements which acknowledge that the

customers of cable operators may experience interference due to the use of electronic communications services in the 800Mhz band and that the parties share the view that measures must be taken to ensure that customers of cable operators do not experience disruption to services provided through the coaxial cable due to the use of electronic communications services in the 800MHz band.

The agreement defines interference as when a customer of a cable operator encounters disruption to the television signal which manifests itself as two or more disturbing blocks appearing in the television picture or a completely frozen or lost picture due to loss of synchronization as a result of the use of telecom devices for electronic communications services via the 800Mhz band and where a reasonable distance from the TV set is assumed.

Both sets of operators take on obligations under the agreement. Cable operator's obligations include an obligation to inform customers about the possibility of disruption and the need for properly insulated cables and to promote the distribution of interference tolerance equipment as part of their regular business operations. This is defined to refer to the common replacement pattern of equipment based on the last 10 years. At the same time mobile operators accept obligations to inform their customers about the possibility for disruption and also to advise cable operators in writing and in advance of their intentions to use masts for providing services in the 800MHz band so that cable operators have the ability to inform their customers ahead of time. Mobile operators also have an obligation within their regular business operations to promote the use of Wi-Fi or frequency bands other than 800MHz in order to prevent disruption. Importantly the agreement commits the mobile operators to resolve interference issues when experienced by customers of cable operators and to settle any damages claims as well as to implement solutions.

**Virgin Media suggests that interference issues to cable should be dealt with under MITCO as well.**

Virgin Media notes that Ofcom's proposal for dealing with DTT interference is to set up a body that will deal with issues of interference, MITCO. Virgin Media believes that there is no justification for excluding interference to cable services from being dealt with under this body as well.

Virgin Media suggests that there are a number of ways in which issues relating to interference to cable services could be brought within MITCO. These include the incorporation of information about cable services and ways to avoid interference within the communications that are to be planned by MITCO in relation to DTT interference. In addition if it were the case that provision of information could not resolve the interference to cable services Virgin Media suggests that a upgrade to a newer generation box that would be immune to interference could be funded by MITCO in the same way that MITCO will fund the provision of filters for DTT customers and in the most serious cases will fund a platform change for DTT customers.

Virgin Media notes that Ofcom intends to place a condition in the licences of the 800MHz licensees that they should share information with MITCO in relation to the deployment of the licensees' network in order to predict the number of filters and platform changes that consumers may require. Virgin Media would suggest that MITCO should ensure that this should be extended so that MITCO could also assess whether information about cable interference would need to be provided and to assess whether cable installations might be affected in particular areas and whether there might be a need for replacement of set top boxes if that was required as well as

### **Information Campaign.**

Ofcom suggests that information and advice should be made available to all DTT households that are likely to be affected in advance of new network rollout and for a period thereafter and that at a minimum this should include coordinated information campaigns and the availability of a dedicated call centre and website. The details of how this will be provided have yet to be clarified with Ofcom indicating that they expect to undertake further research.

Virgin Media notes that in its earlier consultation document Ofcom suggested that Virgin Media's users should be advised of the potential interference from LTE handsets. Given that there is likely to be an information campaign for DTT households and given that there is likely to be an overlap between those households who have DTT services and cable services, Virgin Media suggests that it would be sensible for any information campaign funded by MITCO to cover both risks and interference to cable CPE and DTT services. A coordinated campaign addressing both cable and DTT installation will avoid confusion to customers and will also be better able to direct customer queries to the appropriate source of information.

A number of Virgin Media's customers who take a cable service are likely to have secondary DTT installations and therefore will need to receive information about both their DTT installation and their cable installation. This information needs to be provided in a consistent and holistic manner and Virgin Media suggests that all interested parties need to be involved in the formulation of appropriate communications and communications should be funded by a central source (being MITCO).

Virgin Media is concerned that even if the communications formulated by MITCO did not address possible interference to cable services specifically, any communication from MITCO that is received by a customer who also has cable services is likely to drive calls into Virgin Media's call centres as customers with dual installations may have queries and concerns that will arise from any communications sent by MITCO. It is therefore important that customers are not unduly confused. In order to avoid such confusion and therefore Virgin Media believes that MITCO should fund communications for all services that might be affected by new services in the 800MHz band and should involve all relevant parties in the formulation of the relevant communications.

### **Which DTT customers will be entitled to assistance?**

Virgin Media also notes that at Ofcom's workshop on 5 July it was suggested that customers who had a primary cable or satellite installation and a secondary DTT installation might not be eligible for support to mitigate any interference to that DTT installation on the basis that it was not the customer's primary source of TV. This seems slightly at odd with the position put forward by Ofcom in its consultation document where Ofcom appeared to suggest that customers would be entitled to support even if DTT was their secondary installation. Virgin media notes that in its discussion of platform changes (the most extensive form of support) Ofcom suggested that *"The cost of the platform changes will also depend on how many TVs are connected to the service.... Where DTT is the primary form of reception we expect that a household could require up to 2 or 3 TVs to be connected. Where satellite or cable is available on a main set, but not on secondary sets, in most cases either 1 or 2 TVs would need to be connected."*

Virgin Media would urge Ofcom to clarify its position in relation to support for customers with primary cable installations and secondary DTT installations as soon as possible. Virgin Media would suggest that based on Ofcom's reasoning in the consultation document there seems no justifiable reason for excluding customers with primary cable installations from support for their DTT installation. In addition as Virgin Media has also argued throughout this submission customers should also be entitled to support for problems with their cable installation.

### **Platform Changes**

Virgin Media notes that one other key area of Ofcom's mitigation measures that would touch on Virgin Media is platform changes. Where other mitigation measures cannot protect or restore DTT services Ofcom suggests that both free satellite services and the entry level cable subscription services would offer a range of TV channels that is at least as extensive as DTT. Ofcom suggests that the number of possible platform changes that may be necessary is up to 30,000.

Virgin Media notes however that platform changes and the provision of cable TV services to customers will only be effective if those cable TV services themselves are not affected by interference from LTE handsets and or base stations operating in teh. To this end Virgin Media urges Ofcom to ensure that the issues of potential interference to cable TV are appropriately addressed within MITCO as suggested above.

In addition, Virgin Media notes that Ofcom does not provide details of how it envisages platform changes working in that it is not clear whether it will be the customer's choice of platform or whether this will be decided by MitCo. Virgin Media would suggest that greater details need to be provided and would suggest that in order for a program of platform changes to be effective, MITCO will need to work closely with Virgin Media.

### **Ofcom's Calculation of Numbers of Households Affected by DTT Interference.**

Virgin Media understands from Ofcom's condoc that Ofcom has modelled all base stations as operating at 59dBm when carrying out its modelling of the number of households affected by interference. However Ofcom itself notes that the higher the power of a mobile base station, the more likely it is to cause interference to DTT and that whilst in practice, base stations in a mobile network, operate at different powers, the majority will operate at close to the maximum permitted power level. This is particularly important because when one looks at the technical licence conditions consultation in paragraph 4.12 Ofcom indicates that it is proposed a maximum power limit of 61dBm/5MHz. This is higher than the level at which Ofcom has carried out its modelling and when it is considered that operators will be able to aggregate blocks of 5MHz, an operator with a block of 10MHz will have a maximum power limit of 64dBm.

Virgin Media would suggest that based on Ofcom's comments that the higher the level of power, the more interference is likely to be caused to DTT, Ofcom might need to revisit the issue of the number of households who may be affected.

Virgin Media also understands that there may be other errors in Ofcom's modelling of the number of DTT households likely to be affected. In particular it understands that Ofcom's figures in relation to communal aerial systems may be woefully underestimated. This is particularly of concern to Virgin Media because of the approximately 5.2 million households in the UK who make use of communal aerial systems, approximately 2/3 of these systems are integrated reception systems and provide the potential for households to access both DTT and satellite/cable signals. Virgin Media would want to be sure that customers who may take DTT and cable through these systems will be adequately dealt with as regards issues of interference.

All of this would suggest that rather than racing to finalise these consultations and auction off the spectrum, Ofcom should pause and revisit all of its testing and modelling both for cable and for DTT to ensure that the true consequences are well understood and that it is clear who will pay for what and who will take what responsibility.

A failure to pause and address all of these issues is likely to lead to massive customer confusion and lead to customers being out of pocket. Whilst Virgin Media has outlined some examples above it also notes that Ofcom has appeared to suggest that Ofcom has no responsibility for addressing communal aerial mitigations below the head end on the basis that this is an EMC issue and is therefore not within Ofcom's remit. Ofcom has also made similar suggestions about cable interference.

This approach however fails to put the issues of citizens and consumers first. Consumers see themselves as consuming a service in total. They do not and

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could not be expected to understand whether it is a wireless telegraphy issue falling to Ofcom or an EMC issue falling to DTI for example. In these circumstances who are consumers supposed to turn to for redress to address issues either below the headend (ie cabling) or for cable services. As Virgin Media has set out below, the responsibility for these issues should be placed in one body and it should be clear to customers who they should look to.

Annex 1.

Motion by Schaart and Verburg for the prevention of interference to cable services due to electronic communications services deployed in the 800 MHz band

The Chamber hears the deliberations,

Whereas, cable and mobile telecom operators can limit the chance of disturbance by implementing a number of precautionary measures and can resolve the remainder of the disturbance issue by establishing appropriate agreements

are of the opinion that consumers must not be allowed to experience any interference to provided cable services as a consequence of the use of the 800 band for electronic communications.

requests the government to take care to ensure that cable operators and potential 800 band license-holders negotiate collective agreements before July 1<sup>st</sup> 2011 in order to avoid the chance of consumers encountering disruption to cable services due to the use of the 800 band,

requests the government to include a stipulation in 800-band licenses such that the minister will be able to impose obligations on license-holders for the sake of preventing interference to consumer equipment used for the provision of cable services,

furthermore requests the government to confirm that these obligations will actually be imposed on license holders in the event that consumers are in danger of encountering interference despite precautions taken by the cable operators and mobile telecom operators as well as the agreements between the two parties regarding how individual cases of interference will be resolved.

and proceeds to the order of the day

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Schaart  
Verburg