Cover sheet for response to an Ofcom consultation

BASIC DETAILS

Consultation title:	**Developing a framework for the long term future of UHF spectrum bands IV and V**
To (Ofcom contact):	**Marco Marini**
Name of respondent:	**Andy Sago**
Representing (self or organisation/s):	**BT plc**
Address (if not received by email):	

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Please tick below what part of your response you consider is confidential, giving your reasons why

Nothing	✓	Name/contact details/job title	
Whole response		Organisation	
Part of the response		If there is no separate annex, which parts?	

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Name Andy Sago Signed (if hard copy)

Bringing it all together

Issue 1

BT Response to the Ofcom Call for Input on

Developing a framework for the long term future of UHF spectrum bands IV and V

Submitted to Ofcom on 15 June 2011

Executive Summary

BT welcomes the opportunity to respond to this call for input on the long term future of UHF spectrum bands IV and V. Our BT Vision TV service is partially delivered over this spectrum, and hence we are keen to ensure long term security for access to the UHF spectrum. We are also researching and investigating potential TV white space opportunities and see these as an important development that will achieve even greater efficiency of use of the spectrum in future.

Ofcom already has plans in train (as stated in the Ofcom Annual Plan 2011-12 and the Ofcom Programme of Work 2011-12) for the auction of spectrum at 800 MHz for mobile broadband, and at 600 MHz for other purposes, most likely to be TV broadcasting. Due consideration should be given to ensuring the long term stability of the UHF spectrum (excluding the 800 MHz band) for the broadcasting service, facilitating the digital terrestrial television (DTT) platform and any additional DTT services that may arise from the auction of spectrum at 600 MHz. DTT needs to be able to develop in order to continue to offer a viable competitive alternative to TV delivery via cable or satellite.

The 600 MHz band will be cleared of existing TV usage at the conclusion of digital switchover. We continue to believe that priority should be given to making the 600 MHz spectrum available at the earliest opportunity, immediately following the conclusion of the auction that includes the 800 MHz spectrum. We do not believe there is any justification for delaying the 600 MHz auction further, and the consultation document and the subsequent Statement and Information Memorandum should be issued as soon as possible. The present exercise examining long term use of the UHF spectrum should not disrupt the timeline for the 600 MHz auction process, as to do so would be detrimental to consumers using DTT services reliant on the future evolution of the terrestrial TV platform.

We anticipate that usage of the interleaved spectrum by TV white space devices (WSDs) will become the norm in the long term, maximising the use of the UHF spectrum bands IV and V, and we urge Ofcom to facilitate the enabling of WSDs, both through the measures set out in the Ofcom Annual Plan and through the eventual making of the necessary regulations.

BT does not see a need to prioritise further mobile spectrum availability in UHF spectrum bands IV and V given the availability of new or existing 800 MHz/900 MHz spectrum and the many other spectrum bands already identified for additional mobile spectrum but not yet licenced, as well as the additional spectrum that is in the process of being released by Government that would be suitable for mobile services in the longer term.

Detailed response to the Call for Input

We note that the Call for Input is seeking initial views from all stakeholders on the five overarching themes listed below in relation to UHF spectrum, and any others interested parties feel that Ofcom should take into account:

- Demand and supply of services that are based on UHF spectrum
- Technological developments that will influence UHF spectrum usage
- International developments
- Potential costs and benefits to citizens and consumers from different uses of UHF spectrum
- Timescales associated with any possible future adjustment to the use of UHF spectrum

These themes have been taken in turn under the headings below.

Demand and supply of services that are based on UHF spectrum

The remaining broadcast DTT spectrum after completion of digital switchover is essential to the DTT platform (Freeview) in the UK, without which it would not be possible to deliver the end user free-to-air and pay TV, radio and interactive services. Freeview is the best connected TV platform in the UK. Coverage (using Ofcom's own figures) for the full six-multiplex reception will reach 90% of the population once digital switchover has been completed in 2012. Over half of the TV sets in the UK are already exclusively connected to Freeview[1]. The UK has a high percentage of DTT viewers (rather than cable or satellite only viewers) compared to many European countries, reflecting our long terrestrial TV heritage as well as the particular topography and relatively compact total area of the UK. A successful DTT service now and in the future is extremely important to create effective competition with cable and satellite.

The latest High Definition (HD) services over DTT will also be available to at least 90% of the population at completion of switchover, and the London Olympics will stimulate more households to upgrade their TVs and to take HD TV services for the first time. Freeview's existing capacity is limited to 4-6 HD channels and some 30-40 Standard Definition (SD) channels. We anticipate that demand will rise for additional services[2], including further HD channels, and the 600 MHz spectrum band will help to satisfy this demand. Due consideration should be given to ensuring the long term stability of the UHF spectrum (not including the 800 MHz band) for the broadcasting service, facilitating the current DTT platform and any additional DTT services that may arise from the auction of spectrum at 600 MHz. Another round of disruption through frequency changes and/or new equipment will not be welcomed by citizens.

We anticipate that usage of the interleaved spectrum by TV white space devices (WSDs) will become the norm in the long term, maximising the use of the UHF spectrum. The technology to be used by WSDs is still under development as it awaits resolution of the exact operating parameters and policies necessary for deployment, but there are numerous proposals for applications and services that would benefit from the use of TVWS spectrum. The availability of interleaved channels can be low in some locations and any long term reduction in available channels could lead to deployed services no longer being viable.

We expect that some respondents to this consultation will argue that there is substantial demand for mobile services which could use some of this spectrum. However, substantial former TV spectrum at 800 MHz is already about to be auctioned, intended for mobile use. BT does not believe that, following that auction, there will continue to be insufficient capacity for mobile services. The released spectrum will generate a large increase in national capacity. When considered together with other spectrum to be auctioned (e.g. 2.6 GHz, 2010-2025 MHz, MOD spectrum from within 2.3-2.4 GHz, 3.4-3.6 GHz and in the longer term other Government spectrum bands) plus technology enhancements and developments (e.g. LTE and its further evolutions) there is no evidence yet that total mobile spectrum capacity will be lacking.

[1] 50.1% of the TV sets in the UK are exclusively connected to Freeview. This excludes sets which could use Freeview but are connected to other systems such as satellite or cable. It also excludes some 16.8% of sets still connected to analogue terrestrial TV prior to changeover. (Source: Ofcom Digital Television report 2010 Q4.)

[2] BT's own research on its Vision service identifies an expectation that customers should be able to receive more channels than those available on Freeview today.

Further, as usage of portable devices has grown it has become clear that data usage is increasingly focused on indoor consumption, and is less suited to being served by traditional macro network builds. Frequencies below 1GHz (the range at the heart of this consultation) are more suited for coverage, rather than capacity, and indoor capacity is therefore best served by higher frequency, low power solutions such as Wi-Fi and femtocells, typically at frequencies above 2GHz. A clear trend is emerging towards such small cell systems.

Technological developments that will influence UHF spectrum usage

With respect to DTT, most customers now have HD ready TVs or HDTVs and are therefore seeking HDTV services. Screen Digest estimates that in 2011, 21 million households have HD ready sets and that over six million are subscribing to pay HD services; others have access to the small number of Freeview HD channels. Freeview services are incapable of being extended substantially without access to further spectrum. This is because there is limited scope to improve the efficiency with which existing spectrum is used. We do anticipate some improvements in transmission capacity as standards for picture and sound compression improve, but this is a gradual rather than order of magnitude improvement. A further step of moving existing SD services from DVB-T/MPEG2 transmission to DVB-T2/MPEG4 is not straightforward and this would, for at least ten years, substantially reduce the number of TV sets which could receive these services without adding a further set top box. This is because many early HD ready TVs and the majority of smaller screen TVs do not have the capability to receive transmissions using the new standards.

There is limited potential for further improvement in the efficiency with which terrestrial TV channels use spectrum in the medium term, for example, transmitting using single frequency rather than multi frequency networks, because of the problems of coordination with the transmissions of other countries, requiring changes to complex international agreements that, by their very nature, take years or decades to implement. This assumes that agreement is actually possible to achieve, and that the limitations of single frequency networks (such as challenges in providing regional content variations) are acceptable in the UK context. It seems more likely that the current multi frequency network arrangement in the UK will persist for the foreseeable future.

Already some TV channels are available over the Internet. However, there are limitations on the number of homes that can be served by full screen SD delivered over broadband, and more particularly by HD services, due to factors such as line length, exchange equipment and the availability of fibre. Where cable and TV over broadband remain unavailable, the only competitive sources of TV transmission will be satellite and terrestrial TV. So Freeview offers an alternative platform to satellite for re-sellers to deliver TV services to more than 90% of UK households, and DTT spectrum could enable a truly competitive market to develop, where the vast majority of households have a choice of at least two providers for pay TV services.

As noted earlier in this response, the technology to be used by WSDs is still under development as it awaits resolution of the exact operating parameters and policies necessary for deployment, but there are numerous proposals for applications and services that would benefit from the use of TVWS spectrum. What is apparent is that the efficiency of spectrum use will be enhanced by the accommodation of TVWS systems and we believe that Ofcom's approach of a database system to control access to the bands will be the best approach.

International developments

The proposals for auction of the 600 MHz band are peculiar to the UK. There are no proposals for harmonisation across Europe of the 600 MHz band for new services (other than its existing use for broadcasting), and a low prospect of such harmonisation occurring in the future. This tends to militate against a successful commercial deployment of mobile broadband at 600 MHz due to insufficient scale, but does permit other UK uses such as further HDTV. The same can be said for other parts of the UHF spectrum, apart from the 800 MHz band which is already harmonised for mobile. Further harmonised spectrum suitable for mobile broadband is expected to be made available through awards in other bands (outside UHF spectrum bands IV and V).

We are aware of suggestions that a second "Digital Dividend" could be found from the UHF spectrum in which mobile services could gain additional spectrum beyond the 790-862 MHz band ("the 800 MHz band") that is already harmonised internationally. Spectrum immediately below 790 MHz may be identified by some as being of particular interest for this purpose, but because of the harmonised paired (FDD) band plan being adopted for 790-862 MHz in the UK and other European countries, additional mobile spectrum below 790 MHz would not be useful as a simple extension of the 800 MHz band. We do not support the identification of any such additional mobile spectrum from within UHF spectrum bands IV and V as it would be disruptive and detrimental to the continued availability of additional terrestrial HDTV services. We would urge Ofcom to focus any international efforts to identify additional spectrum for mobile broadband (for example if Ofcom were to support the proposed future ITU WRC Agenda Item on spectrum for "IMT") on other bands above 2 GHz, including bands that Government may eventually clear as a result of the commitment to release at least 500 MHz of spectrum for civil use over the next ten years.

We are aware that there are international negotiations underway in respect of TVWS usage, and we urge Ofcom to strive to expedite these negotiations, and not to allow the long process of harmonisation for TVWS (if indeed it can be achieved) to hinder the opening up of spectrum to WSDs in the UK.

Potential costs and benefits to citizens and consumers from different uses of UHF spectrum

Previous Ofcom consultations on the 600 MHz and 800 MHz spectrum bands and usage of the interleaved spectrum by WSDs have quantified the costs and benefits to citizens. We are not proposing any different uses of the UHF spectrum to those already identified so we have no additional information to put forward.

We do however highlight the difficult adjacent channel compatibility problems that arise between TV and mobile systems. This has been a concern in relation to the 800MHz auction spectrum where careful attention has been paid to the frequency separation of base stations and mobile stations from TV reception channels, including consideration of necessary guard bands and interference mitigation measures (e.g. use of special filters to solve specific problems).

Timescales associated with any possible future adjustment to the use of UHF spectrum

With the major changes and extended timescales for the digital switchover (which has yet to complete), we do not believe that UK viewers and other stakeholders would relish additional changes to spectrum usage through into the long term. Realignment of TV frequencies (as was done for digital switchover) is disruptive and causes substantial help and support costs in the TV industry,

and potentially for equipment manufacturers. Accordingly we do not seek any changes beyond the planned auctions of 800 MHz and 600 MHz band spectrum.