



**BT Response to the Ofcom Consultation:
Digital Dividend Review: 550-630 MHz and 790-854 MHz
- Consultation on detailed award design**

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Executive Summary

- 1 BT is generally supportive of the approach that Ofcom is taking in relation to the award of the cleared DDR spectrum. However, we have concerns on a number of areas of detail, particularly in relation to certain technical aspects and in relation to how the spectrum will support competitive provision of mobile broadband services.
- 2 We understand why Ofcom proposes to include channels 61 and 62 as part of the cleared award. However we are unclear as to what limitations the concurrent TV use of these channels will place on the utility of these channels for other services. The continuing TV use of these channels and the proposed use of channel 69 for PMSE applications together serve to reduce the alignment of the cleared spectrum in the UK with respect to the global IMT band of 790-862 MHz, which is also emerging as a non-mandatory harmonized European mobile band for which mobile systems are being standardized. We therefore urge Ofcom to consider this situation carefully to ensure there is as much clarity as possible on the utility of the 790 – 862 MHz band and that particular concerns in relation to the limited amount of harmonized mobile spectrum are addressed.
- 3 We also have a number of concerns on details in relation to the proposed Technical Licence Conditions (TLCs), including guard band requirements, as well as concern with the proposed licence condition requiring protection of DTT receivers because the practical implications of this condition are rather unclear to us at present.
- 4 On the timing and details of the proposed auction method and how it may operate we have provided our views to the extent possible given the outstanding uncertainties on technical and other aspects. We note that further detailed consultations are expected to follow on these matters and we may therefore provide additional views in due course.
- 5 BT remains ready to work with Ofcom and other stakeholders in the further design of this important spectrum award, to address the matters raised in our responses to the detailed questions as well as the ongoing related international work.

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Contents

1. Introduction	4
2. General issues	4
3. Answers to the questions in the consultation document	5
4. Conclusions	13

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1. Introduction

BT welcomes Ofcom's Consultation Document (CD) on the cleared DDR spectrum award. We have studied this and the associated technical reports that have been published alongside and previously. In section 3 of this BT response we have expressed our present views on the specific consultation questions and in Section 2 we have also provided some more general comments.

The DDR awards are clearly very complex: technically; administratively; and politically. We believe that Ofcom's approach to date has been successful in balancing the various interests and in a way that is coherent with the high level spectrum management policies that Ofcom has introduced.

We also recognise that Ofcom needs to work within an international context, where work is also ongoing in relation to the bands in question and the eventual course and outcome of that activity may further influence some of the UK plans. We have therefore taken into account our knowledge of those international spectrum and standards activities in formulating our views on the UK proposals.

2. General issues

2.1 Technical aspects

As may be apparent from our responses to the individual questions, the technical details of the proposed award are an important aspect on which BT has some outstanding concerns. These do include some of the details relating to the establishment of Technical Licensing Conditions and guard band requirements, but also in terms of the need for a clear definition of the rights and obligations that will be attached to the licenses. The proposed licence condition requiring protection of DTT receivers and the utility of channels 61, 62 and channels close to ch. 69 are matters on which we would appreciate further clarity.

2.2 Mobile applications

We welcome Ofcom's consideration of the likely non-mandatory European harmonised mobile sub-band within the consultation. As we have highlighted later in this document the alignment of the cleared UK channels with this mobile sub-band is only partially achieved. The total amount of nationally cleared spectrum that overlaps the European mobile band (which is also identified in the ITU Radio Regulations as a global IMT band) is somewhat limited. We have provided views in response to the questions on particular issues concerning mobile communications in the DDR band.

3. Answers to the questions in the consultation document

Question 1: This executive summary sets out our proposals for the Digital Dividend Cleared Award. Do you agree with these proposals?

BT has a number of comments on detailed aspects of the proposals, which we explain in our responses to the questions below.

Question 2: Do you agree with our proposal to include the interleaved spectrum in channels 61 and 62 in the cleared award?

We consider that the alignment of the UK cleared spectrum and the emerging non-mandatory harmonized European mobile sub-band 790-862 MHz (also identified in the ITU Radio Regulations as an IMT band) is not at all ideal. This is because channels 61, 62 and 69 would not be available for mobile use in all, or substantial parts of, the UK and therefore alignment with the common European mobile band is significantly affected. The inclusion of channel 61/62 in the cleared award would go some way to mitigating this situation, particularly if these channels could be used for mobile systems in significant parts of the UK. However, Ofcom has not, so far as we can establish, provided clear information concerning the anticipated geographic utility of channels 61 and 62 for mobile services. It is therefore hard to judge whether the inclusion of channels 61 and 62 in the cleared award has any real practical benefits or not.

In so far as we can determine, the consultation document also does not set out precise Spectrum Usage Rights for Ch 61/ 62, other than reference to a licence condition about protecting TV receivers. This again makes it hard to know just how constrained the use of ch. 61/62 is likely to be.

If the utility of channels 61 and 62 for non-broadcasting applications is similar to that of other interleaved channels then we are of the opinion that it may be better to award them in that context.

We would welcome sight of the technical study carried out as referred to in §4.37. In fact, given the breadth of such studies in this and past consultations on the DDR spectrum, we are surprised not to see it included in the annexes.

Question 3: Do you agree with our proposal not to allow licence-exempt use of channels 61 and 62 by cognitive devices?

Ofcom's conclusion on this point seems to be based on the fact that whilst cognitive radio devices are being designed to avoid TV and wireless microphones, they may not be designed to avoid other mobile systems. It is unclear to us why operation of mobile systems in the white space of ch. 61/62, awarded as part of the cleared award, is any different to the possibility of mobile systems being deployed in the white space around other channels to be awarded as part of the Interleaved award. That said, if it is actually more just a question of simplifying the situation, with not much adverse effect on cognitive radio requirements, we would not object as such to Ofcom's proposal.

Question 4: Do you have any comments on our assessment of the most likely uses of the cleared spectrum and the amount of spectrum required for these services? Are there any other potential uses that we should consider?

We agree that the most likely uses of this spectrum are correctly identified by Ofcom and that the amounts of spectrum that stakeholders have indicated they may require seem credible.

Question 5: Do you agree that we should proceed with our current timetable, with a view to holding the cleared award in summer 2009?

Yes. BT believes that the earliest possible auction is in the interests of delivering innovative customer propositions and business models into the market place. This opportunity to introduce competition will stimulate all players, existing and new, to deliver increased customer benefits.

Question 6: Do you have any views on the appropriate notice period for temporary PMSE access to channels 63-68, and/or on whether or not extend temporary access to channels 31-40?

In our view it will be critical to adopt a flexible approach to this issue and ultimately the optimum solution may only be evident once the business plans of the new spectrum holders become clearer.

Question 7: What are your views on deferring the start date for rights to use cleared spectrum in London to help meet the need for wireless microphones and other audio links for the London 2012 Olympic Games and Paralympic Games?

This may be appropriate; it is certainly a relevant consideration. However, more information regarding the precise requirements for the games together with clarity as to whether this spectrum would be the most appropriate for use is likely to be more forthcoming once other consultations relating to spectrum requirements for the Olympics have taken place.

Question 8: Do you agree with the use of SURs as the approach for defining consistent TLCs for this award?

Yes, we agree in principle to the aim of developing Spectrum Usage Rights for the technical licensing conditions for this award. These could be appropriate where there may be a variety of services operating in adjacent channels. However, we will be concerned to ensure that all the details of how these are defined and verified are satisfactorily resolved.

We further note that Ofcom has still not demonstrated a practical example of SURs being applied using modelling with additional measurements to verify the whole principle of SURs. We therefore agree with Ofcom's statement in §5.50 that the TLC's based on SURs could be substituted at a later stage for a TLC based on transmit spectrum masks.

Question 9: Do you have any comments on the SUR parameters listed in Tables 5.1 to 5.5 and the assumptions used to derive them?

We note that the power flux density values that are proposed to form part of the technical licence conditions for mobile broadband applications are derived from scaled mobile network parameters in the 2.6 GHz band. We do not feel that these can be set in stone at this stage, pending further work by such bodies as 3GPP and the WiMAX Forum who are developing parameters for the new bands that have been identified for mobile broadband applications following recent decisions in the ITU.

Furthermore, although the approach used to derive the PFD values is well documented in the consultant's report, BT feels that more work is needed to validate some of the assumptions used in the study. These would include, for instance, consideration of only an urban environment, the selected propagation methods and the chosen spectrum mask. More specific questions are raised below.

We note that an urban environment was assumed to give higher PFD values. However we are uncertain of the assumptions behind this statement. Within Rec. ITU-R P.1546 the urban flag is only used to select different height gain models at the receiver. The use of an urban flag is inapplicable in the low terminal height model from ITU-R P.1411-3 selected for mobile to mobile propagation calculations. We also note that a value of 8dB has been used for the log normal shadow fading

parameter of the model whereas the measurements in the source document reference quoted by Transfinite suggest that the value should be 7dB.

Two PFD height adjustments are referred to: the first uses a well known height gain correction in Rec. ITU-R P.1546 to make an adjustment from 10m to 1.5m. The second refers to a conversion from 1.5m to 10m in ITU-R P.1411-3. Since the terminal height is not a parameter of the latter model, the basis for this scaling is unclear.

On page 8 of the consultant's report it is stated that, with a 10m clutter reference height, the PFD will only show minor differences when scaling the receiver height from 10m to 30m. However, calculations using ITU-R Rec. P.1546-3 indicate that the difference could be as high as 10 dB over this range of heights.

In §4.3.2 of the Transfinite consultant's document describing the BS antenna it is not clear if the assumption of "equal gain" also applies to the vertical direction.

In general, ITU-R Rec. P.1546-3 is intended to be used for distances above 1km. A recently approved extension allows calculations to be made below such distance, but it is clearly stated within the recommendation that this should not be treated as a propagation model, as it is purely for convenience to avoid model switching in a simulator at the 1km threshold. We note that in several of the studies the dimension of the test area is such as to require many calculations to be made for distances lower than 1km, where the use of ITU-R Rec. P.1546-3 is not really appropriate.

Question 10: Do you agree with our proposals for managing interference between new services in the DDR cleared spectrum?

BT is concerned at the size of the guard band that Ofcom proposes to set between an uplink mobile broadband channel and DTT channels. The 16 MHz guard band proposed in Table 5.8 appears to be predicated on radiated measurements in the ERA report¹ that were carried out at a separation distance of 5 metres along the centre of the main beam of a fixed DTT receiving antenna to an omnidirectional antenna of a transmitting mobile device. This does not represent a realistic situation. In practice, the DTT antenna will be at roof-top level and the mobile device will not lie in the boresight region of the DTT antenna except when at some distance from it. Hence the radiation pattern of the DTT antenna and the free-space loss relative to the measurement reference point need to be taken into account. The additional benefit obtained using this approach is at least of the order of 13 dB and generally more than this. This is the situation for a person walking with a handheld device at ground level. BT would be pleased to engage in detailed technical discussions with Ofcom to explore this issue further.

The WiMAX equipment used in the Ofcom commissioned ERA measurements has a modified front-end to convert the r.f. stage from 3.5 GHz to ~800 MHz. This raises concerns over the out-of-band emissions and probably does not represent the realistic performance of a WiMAX transmitting device. We understand that the WiMAX Forum is developing technical specifications for these bands but BT feels it is premature to propose guard bands based on devices whose standards have not yet been developed.

We also note the disparity between the ERA measurements and the conclusions of CEPT ECC TG4 where, in their Report B to ECC², it is concluded that a separation guard band of 8 MHz would restrict the interference probability from transmitting IMT mobile devices into DVB-T fixed reception to 1% (based on simulations using the SEAMCAT tool).

We note that in the case of the TDD-FDD guard band Ofcom concludes that based on the 2.6GHz work a 5MHz guard band could be suitable. Ofcom also indicates that half of this guard band could be allocated to each adjacent operator. We would expect that sharper filter roll-off could be achieved at the lower frequencies and hence that 5MHz may be overly cautious. Therefore it would be

¹ "Conducted and radiated measurements to quantify DVB-T, UMTS and WiMAX interference into DTT", Report for UK Ofcom dated May 2008 (<http://www.ofcom.org.uk/consult/condocs/clearedaward/era.pdf>)

² ECC TG4 Report B: "Technical Options for the Use of a Harmonised Sub-band in the Band 470 – 862 MHz for Fixed/Mobile Applications (including uplinks)"

desirable that Ofcom should do detailed analyses specifically for the DDR frequency range to see whether, with a 5MHz guard band, low power “restricted” use should instead be considered, in order to maximise spectrum utilisation efficiency.

Question 11: Do you agree that the most efficient and effective means of preventing interference to the existing DTT services is by the addition of a protection clause to licences in the cleared spectrum? If not, what alternative approach would you suggest?

The inclusion of the protection clause for DTT services within the licences in the cleared award places considerable risks on the licensees as to what exactly it is that they may be committing themselves to in terms of costs and burdensome processes needed to resolve unknown problems that may arise. If Ofcom has for some reason not set the SURs appropriately, the cost of correcting the situation falls to the licensee. Also the approach proposed might give advantages to some bidders over others if different bidders have different knowledge of the technical situation regarding vulnerability of DTT receivers.

The text in section 5.74 also implies that significant geographic areas would require constraints on the use of the cleared spectrum (presumably to be somehow worked out by the new licensee and enforced by Ofcom under the DTT protection licence condition). If our understanding is correct, Ofcom appears to give no real indication as to the expected extent of this constraint.

For these reasons we have some concerns with Ofcom’s proposals. These concerns might be alleviated if it were possible to include a commitment by Ofcom to make grants to promote spectrum efficiency to any licensee that encounters unforeseen costs in order to comply with the licence condition of protecting DTT. In other words, to provide compensation if the SURs awarded by Ofcom used in the technical conditions in the awarded licences prove to be unsuitable.

Question 12: Do you agree that the best way to finalise the protection clause approach and to address the practical implementation issues is through direct engagement with interested stakeholders? With which stakeholders should we engage?

Yes, we agree that there is considerable discussion needed to understand the consequences of the protection clause, and the need to explore ways to reduce the risk to the new licensees would appear to us to be an important objective. The stakeholders may need to include the potential new licensees and those that have an interest in ensuring the proper protection of DTT as well as the Government (e.g. HM Treasury if compensation commitments are to be included in the solution).

Question 13: What do you believe would be the implications of protecting indoor/set top antennas? Should a distinction be drawn between set-top antennas and larger antennas designed for external reception of TV signals that are loft-mounted?

It would be to the disadvantage of all parties if significant interference problems occur to citizens and consumers and this is clearly important to avoid. The practical situation is therefore paramount and committing to protecting only one TV reception scenario or another could be problematic if significant numbers of people were to be affected. That said it is also necessary to define some clear criteria as to what degree of protection is provided in order that the new licensee has clearly defined rights and obligations. Aligning to the present situation of protecting roof top antennas may be appropriate unless there is a substantial trend towards relying on indoor antenna TV reception.

Question 14: Do you agree with our proposals for managing interference between new and existing users?

See our comments in response to Question 10 in relation to the 16 MHz guard band between mobile uplink channels and DTT channels.

It is not entirely clear what the technical restrictions are likely to be in channels close to channel 69. The upper part of the upper sub-band is prime spectrum for mobile uplinks and those companies interested in this spectrum will need to be clear about the operating conditions.

Question 15: Do you agree with the proposed propagation models and databases to be used for compliance assessment?

As explained in previous responses to Ofcom's SUR consultations, BT does not agree with Ofcom's proposal in §5.126 to use Rec. ITU-R P.1546-3 for base station to base station path loss calculations as it tends to overestimate path loss at short separation distances

As stated in the response to Question 9, BT has concerns over using ITU-R P.1546 for distances below 1km. The recommendation is very specific that the method provided at these small distances is not a propagation model, but a procedure to avoid switching to another recommendation, when used in Monte Carlo simulators, should a very low path length be selected. Since many of the example calculations given in the consultant's document require over 50% of the test points to be calculated for distances below 1km, the validity of the resulting SURs is questionable.

Question 16: Do you have any comments on the transmit masks set out in paras 5.128 to 5.130?

We agree that these may be a reasonable starting point. However, we feel that it may be necessary to revisit these once the technical parameters of mobile equipment that is currently being standardised within these frequency bands are defined.

Question 17: Do you agree that where the cleared spectrum is used for the operation of a DTT multiplex, we should replicate the ownership restrictions from the Broadcasting Act regime relating to (a) local authorities, (b) political bodies, (c) religious bodies and (d) bodies exerting undue influence but not replicate restrictions relating to (e) broadcasting bodies and (f) advertising agencies?

Yes, this appears to us to be the best way of managing the transition from current licensing practice to the single converged, and thus more transparent, proposal tabled by Ofcom.

Question 18: Do you agree that we should facilitate interoperability between existing DTT multiplex operators and new operators using cleared spectrum?

We agree that this seems an appropriate position, although we are not entirely clear what interoperability might be envisaged. However The EPG at least should be available to all viewers/users and it may be that there are other facilities which are centrally important to a competitive market which should be featured in such discussions.

Question 19: We welcome views on the relative merits of such an approach to information provision; in particular concerning the type of information that may be helpful and any impacts that publication of information might have both on licence holders and the wider spectrum market.

Ofcom could consult in more detail once allocations, and thus use, are known. The assumption should be predicated on the minimum necessary and it may be appropriate to have controlled and limited access to the information, once it's made available, rather than totally open access.

Question 20: Do you agree that the cleared award should include both 8 MHz lots for DVB-T and MMS TLCs and 5 MHz lots for FDD and TDD TLCs across the band?

Yes, we agree that this is appropriate despite the fact that it potentially complicates the auction.

Question 21: Do you agree that the cleared award requires a mixture of frequency specific and frequency-generic lots to be offered in the auction?

Yes, we agree that for the reasons that Ofcom has identified there should preferably be both types of lots.

Question 22: Do you agree with the proposed outline definition of lots suitable for MMS, DVB-T, TDD and FDD applications?

Yes, we broadly agree with Ofcom's analysis of this issue.

Question 23: Should the flexibility to bid for lots defined on both fixed and variable frequency rasters be preserved in the auction? If not, which are preferred?

Our initial opinion on this matter is that since a variable frequency raster may help maximize the utilization of the spectrum it should preferably be included in the award design.

Question 24: Do you agree with the proposed basis for awarding Channel 38 as a distinct lot in the auction?

Yes we tend to agree with Ofcom's analysis and conclusion on this issue.

Question 25: Do you agree with the proposed structure of frequency rules for allocating different licence types in the auction? Are there any amendments that would improve the efficiency of spectrum allocation via an auction?

Yes, we agree with the structure of frequency rules that Ofcom proposes for the allocation of different licence types.

Question 26: Do you agree with our proposal to proceed on the basis of UK-wide lots?

Yes, BT agrees with this approach. For channels 61 and 62 and for other channels that may be affected by the need to protect DTT receivers in some areas we would like greater clarity as to what constraints may in practice exist on where or how the frequencies can be used throughout the UK.

Question 27: Do you favour including the available cleared spectrum in (a) Guernsey and (b) Jersey in the geographic coverage of the licences to be awarded? If not, what approach do you favour instead?

Provided it does not delay the award it may be appropriate. We have no reason to preclude such a proposal.

Question 28: Do you agree that the combinatorial clock auction is the most suitable auction design for the cleared DDR award?

The general principle of a combinatorial clock auction appears to best meet the balance of market requirements. However, as with previous (similar) auction designs proposed by Ofcom further consultation on the detail of the auction design will be required before a more definitive response can be provided. For example issues such as eligibility points associated with each lot type and the flexibilities and/or constraints in the round to round switching of bids within an overall eligibility envelop need to be clarified and resolved.

Question 29: What potential simplifications, if any, could be made to the proposed lot structure for DVB-T, MMS, TDD and FDD lot categories which would still reflect the most important differences in value between lots?

BT currently has no suggestions as to how the lot structure under consideration by Ofcom could or should be simplified.

Question 30: Do you have any comments on our proposals for the Application and Qualification Stages of the combinatorial clock auction for the cleared DDR award, including our proposals for initial deposits?

The outline proposals regarding the Application and Qualification Stages are largely in line with previous similar awards, though it is noted that the detail of the time for and between each stage is currently undefined. Ofcom makes reference to rules pertaining to members or associates of one bidder group not being qualified to be members or associates of another group. It is recognised that there are good and rational reasons for this; however in the 2.6GHz award Ofcom did introduce the concept of parties being able to “opt out” of all but one bidder group. This feature was intended to enable investors to provide finance to multiple bidder groups, although doing so in a “deaf and blind” manner regarding confidential information, to prevent collusive behaviour and maintain the integrity and robustness of the auction. If there is an intention to introduce a similar rule in this award, Ofcom is urged to consider introducing it earlier in the consultation process to enable proper scrutiny of any such proposal, as well as refining the proposal in light of practical experiences from the 2.6GHz award.

Question 31: Do you consider that it is important to distinguish relative weightings in advance between the eligibility points of the different 1 MHz blocks available in this award? If so should this be restricted to channels 36, 38, 61 and 62 and what do you consider these relative weightings should be?

Early sight of the proposed relative weightings of lots is valuable as it allows stakeholders to consider the balances between the different lots and possible combinations of lots within packages which could be bid for. It is noted that in other awards there has been a need to ensure an effective mechanism to enable bidders to switch between lots without losing eligibility simply as a result of switching. We agree that it is important to distinguish relative weightings in advance and based on our current assessment of the situation we do agree that at least the four channels identified by Ofcom should have different eligibility points compared to others. At this stage we are unable to quantify this, not least because we do not have sufficient information on the sharing constraints associated with these channels.

Question 32: Do you have any views on whether an ex ante eligibility points activity rule or a revealed preference activity rule should be used in this award?

As Ofcom states that it intends to explore further the potential to develop a revealed preference activity rule for the specific characteristics of this award, we consider it prudent to wait upon the results of these explorations before making a judgement with regards to an ex ante eligibility points activity rule or a relaxed revealed preference activity rule.

Question 33: Do you have any views on whether there should be restrictions on bidders' ability to bid on multiple technical licence types within single package bids or between different rounds of the auction and whether bidder association rules should potentially be adjusted to cater for any such restrictions being imposed?

We currently have no firm views on whether any restrictions are necessary but it does seem possible that bidders may genuinely be interested in more than one type of lot category. We currently find it hard to understand how relaxed bidder association rules could operate when a single entity might be interested in acquiring interests in multiple licence types.

Question 34: Do you have any further comments on any aspect of our proposals for the Principal Stage of the combinatorial clock auction for the cleared DDR award?

Ofcom's proposals for this aspect of the auction seem consistent with proposals for previous, similar auction designs which Ofcom has run. As has happened before, BT would expect Ofcom to update these proposals (if necessary) in the light of practical experience from other awards which occur before this award.

Question 35: Do you have any comments on any aspect of our proposals for the Assignment Stage or the Grant Stage of the combinatorial clock auction for the cleared DDR award?

Ofcom's proposals for this aspect of the auction seem consistent with proposals for previous, similar auction designs which Ofcom has run. As has happened before, BT would expect Ofcom to update these proposals (if necessary) in the light of practical experience from other awards which occur before this award.

Question 36: Do you agree with our approach to assessing whether the award of cleared spectrum fully promotes competition and efficiency?

Yes, we agree with the approach that Ofcom has taken to consider these important matters.

Question 37: Do you have particular concerns about possibilities for award outcomes to fail to fully promote competition in downstream markets or to result in inefficient use of spectrum? If so, please explain what these are and provide supporting evidence.

The historical allocations of mobile spectrum are different for various operators and as Ofcom itself highlights, not all existing mobile operators may secure access to the DDR spectrum. The infrastructure costs of different operators (existing and new entrant) providing similar services could be very different and this factor could affect the long-term level of competition. It may therefore be appropriate to try to design the rules of this award and the subsequent spectrum trading regime in a way that seeks to address this issue. We note that Ofcom addresses this point in Q42 and Q43.

Question 38: Do you agree with our view that we should introduce a general safeguard cap aimed at promoting diversity of spectrum holdings? Do you have views concerning the level of such a cap?

BT agrees with Ofcom's analysis that a general safeguard cap on the amount of spectrum acquired by one bidder would be sensible for this award, providing it is set at a level that would not prevent genuine requirements for using the spectrum in a given radio network to be satisfied. We understand that Ofcom proposes this to go some way to avoid the possibility of the acquisition of spectrum as a means of limiting competition and to promote a diversity of uses of the spectrum band.

We agree that a general safeguard cap of 50 MHz would be reasonable for this particular award.

Question 39: Do you agree with our proposals to include an information provision licence condition to help facilitate efficient secondary trading?

Yes, we agree in principle that such a licence condition would be reasonable to assist with secondary trading. The amount of information should be kept to the minimum necessary and should not be such that these require commercially confidential information to be released that would adversely affect the licensee significantly.

Question 40: Do you agree with our view that we should not apply any other general remedies in the cleared award?

Yes, we agree with Ofcom's conclusion on general remedies that would apply to all uses and users.

Question 41: Do you agree with our identification of the three areas requiring further attention?

Yes, BT agrees that the three issues Ofcom has identified are worthy of detailed consideration.

Question 42: Do you agree with our assessment that the limitations on the amount of cleared spectrum available for mobile broadband applications, and the particular advantages of sub 1GHz spectrum, could result in an outcome where there are limits on the level of competition possible in the provision of these services?

Ofcom has indicated that a competition related concern could exist in particular if two conditions arise:

- (i) the DDR spectrum could realistically only accommodate a small number of mobile operators; and
- (ii) the DDR spectrum could be used to deliver similar services to those provided by other operators who may only have access to higher frequency bands where the required infrastructure investment may be demonstrated to be much higher.

Ofcom can address these concerns in the auction design.

Question 43: Do you think that a soft spectrum cap on either (a) the cleared spectrum suitable for mobile broadband applications alone, or (b) the holding of any sub 1GHz spectrum suitable for mobile broadband applications, which would trigger action if a significant competition concern emerges in relation to the market structure in the future mobile broadband market, could be an appropriate approach to these concerns?

BT agrees that there is merit in Ofcom exploring this idea in more detail.

Question 44: Do you agree with our assessment that issues in the pay TV market are not at this stage primarily an issue for the cleared award?

Yes – but maintain under review.

Question 45: Do you agree with our initial assessment that we should not intervene further in the cleared award to remedy any potential impact on competition resulting from the holding of cleared spectrum by NGW/Arqiva?

We agree with Ofcom's assessment of this matter.

4. Conclusions

BT is supportive of Ofcom's approach to the award of the Digital Dividend. We have set out in this response document our current views on the specific questions that Ofcom has raised in relation to the cleared DDR spectrum award.

BT looks forward to working with Ofcom and other stakeholders to shape the UK award plans through this present and further additional consultations. We would be pleased to meet with Ofcom to further discuss any points if Ofcom would consider that to be helpful.