H3G response to Ofcom Consultation
"Digital Dividend: clearing of the 800MHz band" (published by Ofcom, 2 February 2009)

Summary of Key Points

- H3G agrees with Ofcom's proposal to harmonise the 800MHz band for mobile use.
- In order for maximum benefits to be realised all three channels, 61, 62 and 69 need to be moved and the upper 800MHz band needs to be made available for mobile use as soon as possible.
- The UK should be aiming to lead Europe in achieving harmonised mobile use in the 800MHz band. Ofcom's current timetable proposals do not achieve this.
- Channels 61 and 62 should be made available on a geographical basis as soon as regions are cleared of the relevant channels.
- Channel 69 should be cleared of PMSE use as soon as possible.
- The timetables proposed by Ofcom for retuning household aerials and making changes to network infrastructure to relocate channel 61 and 62 are too long.
- The 800MHz policy, including timing issues, cannot be determined in isolation from wider spectrum policy issues, such as the refarm of the 900MHz band.

Introduction

Hutchison 3G UK Limited ("H3G") fully supports Ofcom's plans to reallocate the Digital Dividend Spectrum, allowing the UK to harmonise the 800MHz band with the proposed European approach to this band. Therefore H3G agrees it would be beneficial to clear channels 61, 62 and 69 to release further mobile broadband spectrum in the 800MHz band as quickly as possible.

The 800MHz frequencies available from the released Digital Dividend Review ("DDR") spectrum offer excellent signal propagation, allowing for networks to be built at lower cost as fewer masts are required to achieve the same level of coverage than at higher frequencies. In particular, lower frequency spectrum has a significant advantage when providing in-building coverage, where mobile broadband is likely to be used. The proposed changes make the 800MHz spectrum available for mobile broadband and will be well suited for mobile use. Acquisition of such spectrum will make it viable for mobile operators to provide better depth of coverage over a larger geographical area benefiting both the consumer and the mobile operator.

However, until channels 61, 62 and 69 are made available there will be no available pairs of spectrum for 3G or future technology evolutions providing mobile broadband services in this band. Until these channels are cleared the 800MHz band will be of limited use for the delivery of mobile broadband.

H3G agrees with Ofcom's assessment that the use of the 800MHz band for mobile broadband will further the interests of citizens and consumers. The benefits from releasing this spectrum to mobile operators will also be in line with the Digital Britain initiatives.[1] H3G would like to facilitate the Government's desire to make available universal high quality broadband, delivering 2Mbps access to over 99% of the UK population by the end of 2012. H3G's ability to do so is contingent only on the fair availability of sufficient and appropriate

[1] See "Digital Britain: Interim Report" January 2009 and H3G's response to that consultation, 12 March 2009

spectrum. The 800MHz spectrum band could be a key part of being able to deliver the Government's objectives, conditional on the availability of sufficient (i.e. at least 15MHz paired) contiguous spectrum to an individual network, available for use at the right time. Therefore H3G would support the approach which achieves the quickest release of spectrum and is not too disruptive to consumers.

In the long term H3G agrees with Ofcom's view that all frequencies and all geographies must be freed up within channels 61-69 for mobile broadband delivery. However, in order for operators to invest in the 800MHz spectrum there needs to be more certainty around the timing of release and a commitment by Ofcom for a faster release of spectrum. Currently H3G believes the plans for clearing channels 61, 62 and 69 are not as fast as they should be and 2014 is too late for the first release of DDR spectrum. H3G is concerned that the timing of release will be too late to meet the Digital Britain objectives by the end of 2012 and therefore supports any initiatives that Ofcom may have to bring forward the date of release, without causing any undue delay to Digital Switchover ("DSO"). H3G understands that in the short term there can only be partial release of spectrum and on a partial geographical basis and restricted bandwidth, but this has already started to happen and thus many regions can be made available for mobile broadband use far earlier than 2012. H3G considers that once the award has taken place, operators should be entitled to start using the spectrum in specific geographic areas where the spectrum is cleared. This will enable operators to roll out their respective networks and deploy mobile broadband services UK wide as soon as possible. H3G would wish to be able to roll out large scale commercial 800MHz operation by 2012, which would require large scale trial deployments during 2011.

H3G also notes Ofcom's duties under the Communications Act to ensure optimal use of the electro-magnetic spectrum. The current timings proposed by Ofcom (whereby the 800MHz band will not be available until 2014) are not an optimal use of spectrum. In some regions within the UK this will mean spectrum will have been dormant for up to 6 years by the time network rollout could then be completed in 2016. H3G supports any proposals that allow for earlier use of some or all of the 800MHz band, including staged release on a geographical and/or partial spectrum basis, as regions and spectrum sub-bands become available.

The release of the 800MHz spectrum should not be reviewed in isolation, and should take into account broader policy issues relating to the use of radio frequency spectrum. H3G refers in particular to its responses to the Digital Britain Interim Report and the 'Application of spectrum liberalisation and trading to the mobile sector' consultations.[2] Individual bands cannot be considered separately because fair and reasonable competition requires fair and reasonable access to spectrum resources. H3G believes that the 900MHz band, being made available through the refarm process, also has an important role to play in allowing operators to provide the required coverage and capacity. Any advantages which the 900MHz spectrum has in relation to timing of availability should also be taken into account to ensure a level competitive playing field.

[2] 'Application of spectrum liberalisation and trading to the mobile sector', 13 February 2009 and H3G's forthcoming response to that consultation

Questions

The costs and benefits of clearing the 800MHz band

Question 1. Do you agree that clearing DTT from channels 61 and 62 and PMSE from channel 69 to align the upper band of cleared spectrum in the UK with the emerging digital dividend in other European countries is likely to further the interests of citizens and consumers to the greatest extent?

Yes. Clearing DTT from channels 61 and 62 and PMSE from channel 69 is likely to further the interests of citizens and consumers to the greatest extent. The reorganisation improves the usefulness of the spectrum by creating a larger contiguous mobile broadband-ready set of frequencies than previously proposed. Further, H3G has always maintained that international standardisation is of utmost importance, as common technology deployments in different countries should improve equipment availability, particularly in terms of access to mainstream inexpensive and attractive mobile devices. The changes will greatly improve opportunites for new generations of mobile broadband use and increase scope for competition and innovation in new wireless services.

Low frequency spectrum use allowing lower cost to achieve coverage will promote further investment in mobile broadband to increase in-building and rural coverage and will foster efficient radio spectrum usage. With the availability of such low frequency spectrum for mobile broadband (especially for future technologies such as Long Term Evolution (LTE)), mobile broadband will also be able to promote the Government's policy objectives to make 2Mbps broadband as widely available as possible.

H3G agrees with Ofcom's analysis that the benefits of having a band available for mobile use, that is compatible with the rest of Europe, outweighs the costs of migrating services out of the 790 – 862 MHz band. H3G also agrees with Ofcom that the costs should be paid for by the Government or included in the licence fees. It should be noted that the 800MHz band will not provide a usable spectrum pair for mobile broadband use unless channels 61, 62 and 69 have been cleared of PMSE and DTT use.[3]

Ofcom have stated that "An increasing number of other European countries are now following the UK's example by creating a digital dividend and planning to release it in a way that will allow new services to be deployed, in particular new generations of mobile technology".[4] We encourage Ofcom to continue to lead the way in deploying the digital dividend as quickly and efficiently as possible and not to fall behind in achieving harmonisation with the rest of Europe.

Moving DTT from channels 61 and 62

Question 2. Do you agree that the proposed DTT migration criteria are proportionate and appropriate? If not, please explain why and clearly identify any other criteria you believe should be adopted and why.

No comment. However H3G does believe that channels 61 and 62 must be cleared as rapidly as possible to enable partial geographical deployment before 2012 and full geographical deployment during 2012. H3G fully supports the work that Ofcom have

[3] See our response to Question 4.
[4] Page 7, paragraph 2.20 of the consultation document

undertaken with Arqiva[5] to find ways for a faster roll out and hope that spectrum will be available before the Ofcom proposed timescales.

Question 3. Do you have views on the options identified and our assessment of them? Do you believe there are other, superior options, and, if so, why? Do you agree that the hybrid option is most consistent with the DTT migration criteria?

H3G supports migrating DTT use in channels 61 and 62 into channels 39 and 40. H3G would support the approach which achieves this the quickest and is least disruptive to citizens and consumers. H3G notes that Ofcom considers this to be the two-step hybrid approach. H3G believes timing is crucial when releasing spectrum and it is of utmost importance that regions are cleared of channels 61 and 62 as soon as possible. Use of cleared spectrum should be allowed immediately in each region rather than waiting for national clearance in 2014.

Question 4. Do you have views on the implementation-timing options identified and our assessment of them? Do you agree that DSO-integrated implementation is most consistent with the DTT migration criteria? If not, why not?

Given the substantial net benefits in clearing the full 800MHz band, any delays to full clearance are likely to be very costly to UK citizens and consumers. If the timetable for clearance is brought forward, the NPV of the benefits obtainable would surely be substantially enhanced.

Both channels 61 and 62 need to be cleared of DTT as fast as possible so that awarded parties can start using spectrum and reaping the benefits. It is felt that the current plans for clearance are not as fast as they should be. H3G supports any work that Ofcom may be carrying out for a faster release of channels 61 and 62.

H3G considers that region-by-region clearing and use is possible technically and desirable economically.

CEPT has proposed that the 72MHz of spectrum, once cleared, can be split into 2x30MHz of paired bands, giving 6x5MHz of spectrum accompanied with 12MHz of separation between the two bands.[6] H3G supports CEPT's proposal and considers this to be an optimal use of the 800MHz frequency.

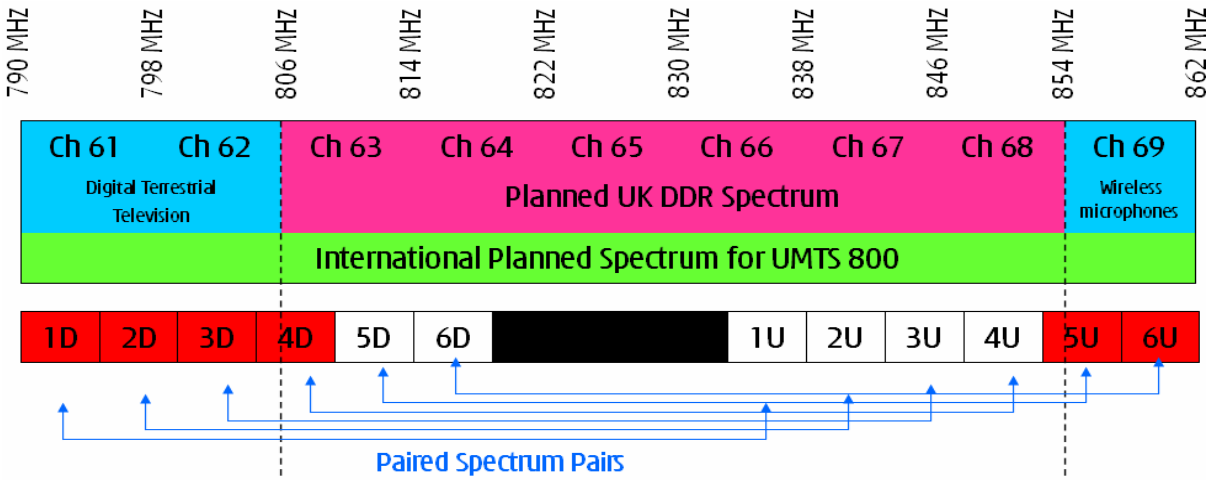
Figure 1 below summarises CEPT's proposal for spectrum allocation in the 800MHz band where broadcasting channels have been split in 8MHz bandwidths and mobile split in 5MHz bandwidths. From the figure it is apparent that channels 61, 62 and 69 are all being occupied and there are no uplink/downlink spectrum pairs available for mobile operation at present. If channel 69 was to become available this would permit mobile operation in the uplink/downlink spectrum pairs 5 and 6, by specifically freeing up both the uplink components. Clearing channel 62 (shown in figure 2) would permit the use of spectrum pairs 3 and 4. Clearing channel 61 on its own would only enable spectrum pair 1, but in conjunction with channel 62 it would enable spectrum pairs 1 and 2 along with 3 and 4.

[5] Ch61 & 62 refarming study by Arqiva final report 27 October 2008

[6] Channelling arrangements for the 790-862 MHz band (Task 2 of the 2nd Mandate to CEPT on the digital dividend) Draft CEPT Report to ECC, 18 February 2009

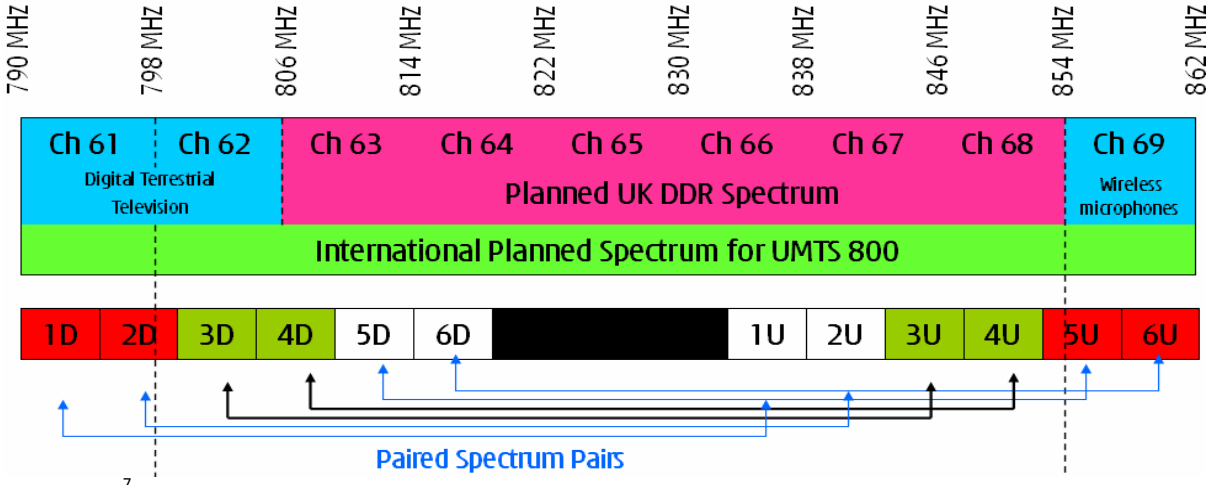
Therefore channels 62 and 69 have a higher priority for clearance than channel 61, but ideally all three channels should be freed as early as possible.

Figure 1 : Current spectrum allocation between 790MHz and 862MHz



Source: H3G

Figure 2 : The proposal of releasing channel 62 in the upper spectrum band of 790MHz and 862MHz.



Source: H3G[7]

H3G agrees that Ofcom should not make any amendments to the DSO timetable and therefore when considering the timing options, integrating the clearing of DTT channels 61 and 62 with DSO is preferred.

However, H3G believes DTT clearing can be completed within a shorter timeframe than is currently proposed. First, we understand that channels 61 and 62 are already unused over large geographical areas and this will continue to increase. Secondly, we understand that DTT clearance will require replacement or retuning of equipment at less than 200 sites. Currently, H3G is in the process of commissioning and decommissioning over 5000 cell sites per year. Accordingly, H3G considers that Ofcom's estimate to clear DTT from channels 61

[7] Figures 1 and 2 are illustrated by H3G but the source of the proposed UMTS uplink and downlink plan comes from CEPT

and 62 of at least 12 months, starting at the end of 2012, can be faster, and we fully support the Government's 'speed up' inititiave.

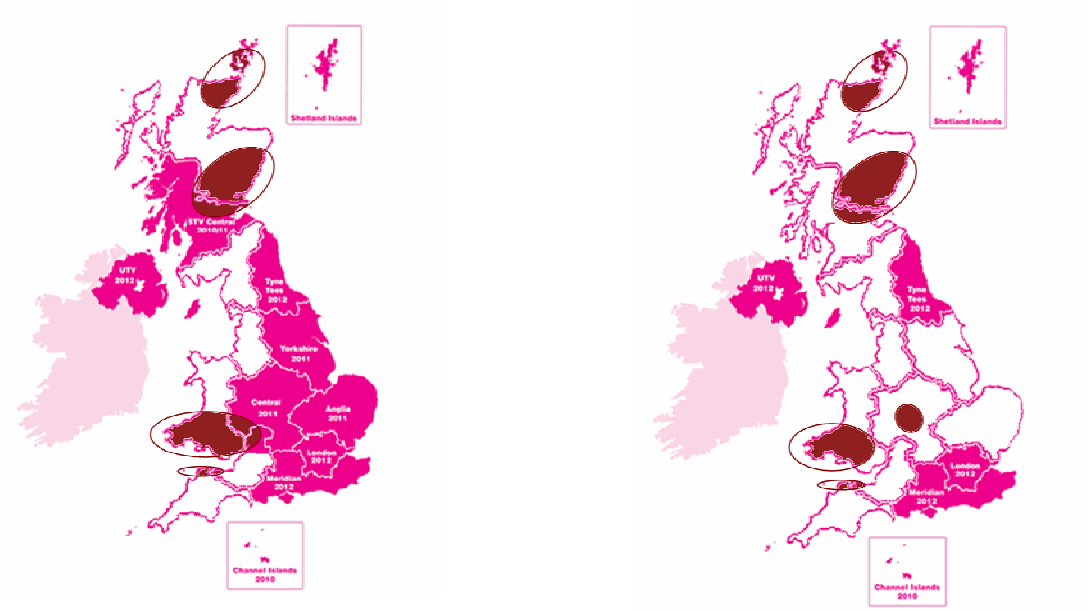
H3G also considers that permitting regional use of spectrum as soon as it is cleared would not have any negative impact on consumers, whereas it would enable much earlier benefits for consumers in the delivery of mobile broadband.

H3G is very confident that it is technically possible for a geographical mix of non-cleared DTT areas (channels 61 and 62) and mobile use to coexist in the short term. Assuming that the mobile downlink is in the low band (as proposed) then it is a matter of planning the mobile cell sites such that their signal is low enough at the edge of the region where channels 61 and 62 are used. It should however be noted that whilst the TV requirement is for much higher signal to noise ratio (SNR) than the mobile requirement, the antennas used for TV reception are strongly directional and pointing into the TV region. It is therefore only a matter of careful planning and agreed thresholds at a geographical boundary that will allow a regional mix of mobile and television during the transitional period.

Figure 3 shows the proposed geographical spectrum release of channel 62 at the end of 2010 and then at the end of 2011. By 2011 there are only a handful of areas that remain uncleared for channel 62, therefore it is very much possible for an operator to start rolling out sites over a large area straight after the award. H3G would require around two years to roll out new network equipment to deploy the 800MHz frequency and if we start roll out at the beginning of 2011, we should be finished by 2012. If H3G is to start rolling out new equipment in 2014 as proposed by Ofcom, we would not finish until 2016, which is 6 years after clearance in some regions.

Figure 3: Proposed geographical spectrum release

Channel 62 DTT Position at the End of 2010 **Channel 62 DTT Position at the End of 2011**



Pink = DSO channels 63-68
Red = Channel 62

Ofcom should also ensure that there is no new deployment within channels 61 and 62. DTT should not be allowed to use channels 61-68 after 2012 so that spectrum is cleared and made available as soon as possible. If any of these channels do include outside broadcasting equipment then this should also be moved to different channels away from the cleared spectrum to avoid interference as early as possible. Mobile operators can then start deploying mobile broadband services in specific geographical areas cleared of DTT use before 2012.

The release of the 800MHz spectrum should not be reviewed in isolation, and should take into account broader policy issues relating to the use of radio frequency spectrum. H3G considers that the 800MHz band and the existing 900MHz band have similar characteristics, and are therefore largely equivalent in their ability to allow operators to supply better in-building mobile broadband coverage by deploying new technologies like LTE or WiMaX.

Accordingly, the potential timing, cost and availability of these two spectrum bands is extremely important. 800MHz spectrum should be made available as soon as possible and Ofcom should consider efficient ways of allowing some of the cleared spectrum to be used as soon as the proposed award process is complete (which Ofcom states is expected in 2010). H3G would want to deploy large scale trials within 2011 to permit large scale commercial deployment in 2012.

Ofcom has stated DSO will not be complete until 2012 and subsequently under its current proposals the 800MHz spectrum band will not be available at all (not even for geographic use) until 2014. However, the release of the 900MHz spectrum band for mobile broadband use is expected around 2011-12. If refarm is implemented under Ofcom's most recent proposals, this will place H3G at a significant competitive disadvantage in the delivery of 3G and mobile broadband services.

Question 5. Do you agree that a programme-control and -governance arrangement such as that outlined above is appropriate?

No comment.

Question 6. Do you agree that the four cost categories adequately capture the costs associated with clearing DTT from channels 61 and 62? Are there any costs that do not appear to have been accounted for in any of these categories?

No comment.

Question 7. Do you agree that our cost profile is a reasonable basis for planning the capital expenditure for clearing DTT from channels 61 and 62?

No comment.

Moving PMSE from channel 69

Question 8. Do you agree that these are the most appropriate criteria to assess which spectrum is the best alternative to channel 69 for PMSE?

Yes. H3G believes the suggested criteria are the most appropriate to assess a suitable alternative for channel 69 and we think that channel 38 is the most suitable alternative for PMSE users to relocate to.

H3G considers that PMSE use in channel 69 is not optimal use of the spectrum. The value to society of channel 69 being utilised for PMSE use is far outweighed by channel 69 forming part of a fully cleared 800MHz band. Therefore we would support any proposal to reallocate PMSE in any other non-interfering channel.

H3G does not consider it appropriate for PMSE users to occupy the Frequency Division Duplex (FDD) band, which is the 12MHz centre gap at 820-832MHz between the uplink and downlink frequencies, although channel 65 could be used for low powered wireless microphone devices on a temporary basis until DSO is complete. H3G does not agree that use of the FDD duplex gap is a viable long term solution because there would be very tight interference related requirements which are not commensurate with this type of equipment.

Question 9. Do you agree with our technical and coverage analysis of the possible alternatives to channel 69 for PMSE?

H3G agrees that channel 38, which is currently being used for radio-astronomy, is the best alternative for PMSE users. This according to Ofcom is currently available for use by wireless microphones on a secondary, non-interference basis, already offering UK wide coverage for PMSE. This means that PMSE users will be available to move as soon as spectrum has been awarded in 2010.

H3G considers that radioastronomy and PMSE use in channel 38 can coexist in large areas of the UK immediately. Therefore it is only in certain geographical areas where there is a need for a temporary solution for PMSE users.

Question 10. Do you agree with our economic assessment of the realistic alternatives to channel 69 for PMSE?

No comment.

Question 11. Do you agree that channel 38 is the best alternative to channel 69 for PMSE?

Yes. H3G agrees that channel 38 provides the best alternative of the options provided for PMSE users.

Question 12. Do you agree that we should award channel 38 to the band manager on the same terms as would have applied to channel 69?

H3G have no comment providing that this approach will facilitate rapid and complete clearance on channel 69.

Question 13. Do you agree with our proposal to maintain PMSE access to channel 36 on 12 months' notice to cease and to the rest of the cleared spectrum (channels 31-35, 37 and 61-69) until DSO is completed in the UK in late 2012?

Further clarification is still needed around the timescales as to when Ofcom is going to fully move PMSE channel 69 users over to channel 38. There should be an immediate cessation of any further licences in channel 69. Channel 69 need not be cleared of low power devices immediately: for example, clearance could be regional and need not be completed before the start of mobile deployment. However where interference occurs to either the low power device or the mobile systems there should be replacement or retuning of the relevant PMSE equipment. However, channel 69 does need to be cleared of high power devices, if there are any, before the date of mobile deployment. H3G does not agree with Ofcom's suggestion of temporary usage of channels 63-68 for PMSE as this will not allow mobile broadband deployment, although channel 65 could be used for low powered devices for this purpose on a temporary basis until DSO is complete. H3G does not agree that use of the FDD duplex gap is a viable long term solution because there would be very tight interference related requirements.

H3G would support any proposal to clear PMSE use from channel 69 as soon as possible. As stated in our response to Question 4, optimal use of the 800MHz band for mobile broadband is not possible until channel 69 is cleared.

Question 14. Do you agree with our approach to determining eligibility for, and our assessment of the level of, funding to move PMSE from channel 69?

H3G needs further clarification when calculating the cost of moving PMSE. H3G is uncertain as to the status of the "other" 62% of microphones that seem to be using the channel 69 spectrum without a licence. Just to clarify, H3G urges Ofcom to clear channel 69 of not just wireless microphones and broadcasting equipment but all other devices to avoid any future interference issues. Any remaining equipment in this band beyond 2012 would be likely to result in considerable costs to both the mobile operator and the PMSE user.

Question 15. Do you agree that three years is long enough for PMSE to move from channel 69?

H3G thinks that 3 years is far too long to move PMSE users out of channel 69, for the reasons given in questions 9 and 13. It is important that PMSE users are moved out of channel 69 efficiently and in a timely manner so as to avoid disruption to the timing of awarding the upper 800MHz spectrum band. However as stated in our responses relating to channels 61 and 62, this clearance could be phased regionally.

H3G also considers that if the costs of transferring PMSE users from channel 69 are of the magnitude suggested by Ofcom, the best approach is for PMSE users to be shifted as soon as possible, and such costs to be met by the Government. The net costs of relocating PMSE users will be comfortably compensated by the enhanced net benefits of the full 800MHz band being available for mobile use.

In general once the decision is made to shift users out of one channel (i.e. channels 61 and 62 to 39 and 40 and channel 69 to 38), it is in all users' interests (including those being relocated) to shift as soon as possible and without undue delay. Accordingly, there is no benefit (but great opportunity cost) in delaying the relocation of PMSE users.

Impact assessment

Question 16. Do you agree that with our analysis of the key impacts of our policy options? Are there any other key impacts we should assess?

The Digital Dividend band will be of very limited use to a mobile broadband network operator until channels 61 – 69 are cleared of the current DTT and PMSE use. H3G considers that regional use can be made of cleared spectrum prior to completion of the DSO programme and as stated previously the spectrum starts to be usable as soon as channel 62 or 69 is cleared.

Further clarity is needed as to the award process for the 800MHz band in 2010, and whether Ofcom plan to award the upper and lower bands of spectrum either together or separately. Ofcom have stated that the spectrum below 790MHz will be used for broadcasting purposes and above 790MHz for mobile services. H3G believes there should be no problem in awarding the upper and lower spectrum bands independently and still remaining competitively and technologically neutral.

H3G believes further clarification is needed around the award process and the timing of the release of spectrum. Ofcom's document indicates concerns around how the geographic-interleaved spectrum should be awarded and whether it should be alongside or separate to the cleared awards. H3G agrees that channels 61-69 need to be cleared nationally; there should be regional clearing and regional use of spectrum accompanied by strict timescales for national clearance. Again Ofcom should prevent any delays in awarding the spectrum but at the same time making sure the optimal bandwidths are available for award so that the Digital Britain objectives can be met.

If the right spectrum licences are available, then H3G believes the industry will have the right incentives to invest in order to deliver world-leading mobile broadband networks for the UK with consequent benefits for the wider economy. Such a high quality mobile broadband infrastructure requires suitable blocks of contiguous spectrum.

The capacity, coverage and download speed capabilities provided to operators through spectrum policies should not be distorted. This requires a holistic view to be taken across all mobile broadband-ready spectrum bands such that the spectrum resource available to any individual operator, and the terms on which it is available, do not become a source of competitive advantage. Further, spectrum holdings must not be fragmented, but allow operators access to the large contiguous bandwidths which can deliver higher speeds (if necessary based on network sharing arrangements). Mobile broadband infrastructure that can achieve the objectives of Digital Britain will need to provide indoor coverage. Viable 2Mbps access indoors across the vast majority of the UK population will be more efficiently achieved with access to contiguous bandwidths of lower frequency spectrum (800MHz or 900MHz bands) of at least 15MHz paired. In order to achieve its objectives, the Government should therefore ensure an open and transparent process for allowing operators access to such spectrum.

This valuable spectrum needs to be made available for mobile broadband use as soon as possible. A positive way forward would be for Ofcom to allow some of the cleared spectrum to be used as soon as the award process is complete towards the end of 2010.

H3G notes Ofcom's statement in the consultation paper that spectrum is to be made available on a service and technology neutral basis, subject to meeting interference requirements. H3G agrees with this approach but considers that competing uses are more likely to breach interference limits. Therefore realistically licence conditions should ensure that priority is given in the band to FDD mobile systems.