Qualcomm response to OFCOM's consultation on the Digital Dividend Review: 550-630 MHz and 790-854 MHz detailed award design

Qualcomm welcomes the opportunity to comment on OFCOM public consultation on the detailed award design for the 550-630 MHz and 790-854 MHz bands. Qualcomm views this consultation as a critical step in the Digital Dividend Review (DDR). OFCOM has been successful in identifying a 108MHz digital dividend in the UK. Following OFCOM's initial public releases on the DDR, the European Commission has issued a communication on "Reaping the full benefits of the digital dividend in Europe" and two mandates to the CEPT on related technical issues. The digital dividend has triggered extensive discussions at the European Commission, the European Council and the European Parliament level, while the CEPT has completed the first Commission mandate and is currently working on the second Commission mandate on the digital dividend. The present consultation is an opportunity for OFCOM to combine the best proposals arising from both the UK and European digital dividend review processes.

The following conclusions of the Parliament, the Council and the CEPT, align with the following OFCOM proposals:

- *The introduction of new services in the digital dividend should be based on the principle of technology neutrality.*
- *The digital dividend should be freed for new services as one or several contiguous spectrum bands rather than interleaved spectrum.*

The European wide discussions on the digital dividend have produced additional valuable information on the best citizens' interest with regards to the digital dividend. Specifically, the following principles have been adopted for upcoming rounds of discussions:

- *The concept of service neutrality (in the sense of ITU service neutrality) will not be effective in maximizing the efficiency of the spectrum use. As such, it should be discarded for a band as valuable as the UHF spectrum. For example, the CEPT is now focusing on studies where the 470-790MHz band is allocated to broadcast services while the 790-862MHz band is allocated to mobile communication services.*

- *Developing a pan-European frequency harmonization will trigger economies of scale, which will guarantee timely availability of affordable equipment. Pan-European frequency harmonization should be based on the current and forthcoming CEPT reports to the EC mandates on digital dividend to ensure mass-market benefits to UK citizens.*
- *Ex-ante regulation should be avoided as it hampers new business models and reduces the incentive for new investment.*

- *Mobile internet access is key to the economic performance of a country. Several economic studies have demonstrated the economic benefits resulting from the deployment of nationwide mobile internet access networks. Therefore, Qualcomm believes that Europeans citizens' best interest lies in ensuring the rapid deployment of nationwide coverage networks. Qualcomm fears that a purely auction-based award process will preempt valuable investment that will no longer be available for subsequent network deployment.*

Qualcomm appreciates the leading role that OFCOM, BERR and DCMS have taken within the UK and Europe on the Digital Dividend. There is always a balance to be struck between being an early mover on one hand but on the other making sure that any UK approach is consistent with that of the rest of Europe. This is particularly true for spectrum. Qualcomm favours a European harmonized approach for the band plan to enable the citizen to reap the benefits of economies of scale. Qualcomm is noticing the interesting progress made by Sweden, Finland and France in this process. Therefore, Qualcomm believes that the UK's best interest lies in allocating the whole 790-862MHz band to mobile communication.

Qualcomm recommends taking into account and adopting at the national level the results of the CEPT on-going work at ECC TG4, ECC SE42 and ECC PT1. Of particular interest are the response of the ECC to the EC mandate on digital dividend, ECC PT1 work on the band plan and the SE42 work on minimal restrictive technical conditions for the UHF band.

Noticing the Europe-wide rapid growth of data traffic on 3G networks, Qualcomm stresses the importance of accelerating the refarming of the 900 and 1800 MHz bands and clarifying the corresponding process in order to allow operators to take informative decisions about entering awards for additional spectrum bands, especially sub-1GHz spectrum bands. This would allow operators to assess risks and opportunity correctly and ultimately would allow most effective award of the digital dividend, which in turn is of interest to the citizen. Furthermore, as the 790-862MHz band offers similar propagation characteristics as the 900MHz band, its availability may offer additional options for the OFCOM to resolve the refarming competition issues of the 900MHz band.

In my team Wassim Chourbaji - Spectrum Lead for Europe/Mena - (wassim@qualcomm.com, +33 620386431) remains available for any further information that you may request regarding this submission.

Sincerely yours,

Isabella de Michelis di Slonghello
Sr Dir. - Head Government Affairs Europe & Mena

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

Qualcomm would like to introduce the following suggestions to amend OFCOM's proposals for the Digital Dividend Cleared Award.

Available Spectrum	OFCOM proposals for consultation	Qualcomm suggestions
Spectrum included in the cleared award	The cleared award will include the following spectrum bands: • 112 MHz of spectrum cleared on a UK-wide basis as a result of DSO; • 8 MHz of spectrum cleared on a UK-wide basis as a result of aeronautical radar ceasing to use channel 36 in March 2009; • 8 MHz of spectrum cleared on a UK-wide basis as a result of UK radio astronomy ceasing to use channel 38 in 2012; and • 16 MHz of interleaved spectrum in channels 61 and 62. The cleared spectrum comprises two blocks of contiguous spectrum: 550-630 MHz and 806-854 MHz. The interleaved spectrum comprises 790-806 MHz.	The whole 790-862 MHz band should be cleared on a nationwide basis for mobile broadband services to align with harmonized European usage of the band.
Timing	**OFCOM proposals**	**Qualcomm suggestions**
Timing of the cleared award	We propose to hold the cleared award so that the award begins in Summer 2009	Spectrum timing should be subject to completion of studies in CEPT. The process of refarming of the 900 and 1800MHz band should be clarified and accelerated in order to allow operators to take informative decisions about bidding on additional spectrum bands, especially sub-1GHz spectrum bands.
Continued PMSE access to cleared spectrum	We consider whether to increase the notice period for ending temporary PMSE access to channels 63-68 from 6 to 12 months. We also consider whether to offer temporary access to channels 31-40.	Qualcomm believes that PMSE devices should be relocated to lower parts of the band and that channels 69 should be cleared (even if a short transition period is required to do so) and made available as cleared spectrum on a nationwide basis.
Technical licence conditions (TLCs)	**OFCOM proposals**	**Qualcomm suggestions**
Type of TLCs	We propose to define the TLCs for the available spectrum in the form of Spectrum Usage Rights (SURs). The SURs will be tailored to the different transmission network types that are likely to be deployed in the spectrum.	TLCs should be aligned with the result of the studies conducted by the ECC TG4, ECC SE42 and ECC PT1.
Guard bands	We suggest guard bands will be needed between licences	TLCs should be aligned with the result of the studies

	with different SUR types. Winners of licences will be able to negotiate with licensees in adjacent spectrum in order to modify the emission restrictions contained in the guard bands.	conducted by the ECC TG4, ECC SE42 and ECC PT1. ECC reports 21, 22 and 23 (CEPT responses to the EC mandate on digital dividend) demonstrate that guard bands are not required between DVB-T services, Mobile Multimedia Services and mobile communication FDD Downlink services.
Protection of existing DTT services	To prevent interference to existing DTT services adjacent to the available spectrum, we propose to include a clause in every licence in the DDR Cleared Award. The clause would place an onus on the new licensees to plan network roll out to keep interference to existing DTT services to a minimum.	TLCs should be aligned with the result of the studies conducted by the ECC TG4, ECC SE42 and ECC PT1. The results of CEPT studies will provide the OFCOM with the appropriate solution to prevent interference to existing DTT services.
Spectrum packaging	**OFCOM proposals**	**Qualcomm suggestions**
Frequency size of lots	Both 5 MHz and 8 MHz lots should be offered across the available spectrum.	Qualcomm agrees 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.
Frequency specificity of lots	A mixture of frequency-specific and frequency-generic lots should be offered, grouped into around 35 categories.	The value of the 790-862MHz sub-band lies in the harmonization across Europe of the whole 790-862MHz band for mobile communications. Therefore, Qualcomm believes that there is a strong need to avoid mixing high power (broadcast) and low power (mobile communication) in the 790-862MHz sub-band. Qualcomm strongly recommends OFCOM to avoid implementing a flexible FDD/TDD band plan. Qualcomm urges OFCOM to implement the harmonized CEPT defined band plan in the 790-862MHz band. This will significantly simplify the auction process for the 790-862MHz band and guarantee the availability of mass market equipment benefiting from economies of scale.
Geographic scope of lots	All lots should be UK-wide in geographic scope.	Agreed.
Competition and efficient use of spectrum	**OFCOM proposals**	**Qualcomm suggestions**
Sub 1 GHz spectrum for mobile broadband	We consider ways to address competition concerns relating to operators holding large amounts of spectrum below 1 GHz suitable for mobile broadband services. We ask for views on whether a ‘soft’ spectrum cap might be a suitable remedy.	The process of refarming of the 900 and 1800MHz band should be clarified and accelerated in order to allow operators to take informative decisions about bidding on additional spectrum bands, especially sub-1GHz spectrum bands. The availability of the 790-862MHz band may offer additional options for the OFCOM to resolve the refarming competition issues of the 900MHz band as both bands

		present similar propagation characteristics.

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

Qualcomm agrees with the proposal to include the interleaved spectrum in channels 61 and 62 in the cleared award.
Furthermore, Qualcomm believes that the value of the 806-854MHz sub-band lies in the harmonization across Europe of the whole 790-862MHz band for mobile communications. The CEPT is currently developing a harmonized band plan for the 790-862MHz band. Harmonization allows the design of cost effective equipment in a timely manner and is a prerequisite to commercial success for mobile communication services. The social value of the 806-854MHz sub-band for UK citizens will be significantly degraded if channel 61 and 62 are not cleared on a nationwide basis. Qualcomm understands that it is technically possible to clear the spectrum on a nationwide basis. Qualcomm believes that the cost of clearing the spectrum would be significantly lower than the economic and societal benefits associated with the availability of the whole 790-862MHz band for mobile communications.
Therefore, Qualcomm would like to make the following proposals:
-channels 61 and 62 should be cleared (even if a short transition period is required to do so) and made available as cleared spectrum on a nationwide basis.
-channels 61 and 62 should be included as cleared spectrum in the cleared award.

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

Qualcomm believes that channels 61 and 62 should be cleared (even if a short transition period is required to do so) and made available as cleared spectrum on a nationwide basis.
Qualcomm believes that the value of the 806-854MHz sub-band lies in the harmonization across Europe of the whole 790-862MHz band for mobile communications. The CEPT is currently developing a harmonized band plan for the 790-862MHz band. Harmonization allows the design of cost effective equipment in a timely manner and is a prerequisite to commercial success for mobile communication services. The social value of the 806-854MHz sub-band for UK citizens will be significantly degraded if channel 61 and 62 are not cleared on a nationwide basis. Qualcomm understands that it is technically possible to clear the spectrum on a nationwide basis. Qualcomm believes that the cost of clearing the spectrum would be significantly lower than the economic and societal benefits associated with the availability of the whole 790-862MHz band for mobile communications.

However, should channel 61 and 62 remain available only as interleaved spectrum, Qualcomm believes that licenced use of the spectrum is preferable to licence-exempt use, in order to guarantee the protection of the TV service and maintain future refarming options.

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?

The availability of the whole 790-862 MHz sub-band would allow telecom operators to deploy several broadband mobile networks, potentially providing broadband mobile internet access on a nationwide footprint, in a competitive environment. Wide area mobile internet access has been recognized as a key for economic national competitiveness and reduction of the digital divide between urban and rural areas.
Therefore, availability of the whole 790-862 MHz sub-band for harmonized broadband mobile networks maximizes the economic and societal value of the sub-band for the UK and UK citizens.

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

As the value of the 790-862MHz band lies in harmonization, the studies conducted by the CEPT to determine a harmonized band plan and harmonized technical condition of access to the spectrum should become the main driver of the award timetable. The award of the cleared spectrum should be conditioned on the completion of these CEPT studies. Early award of the spectrum does not hold a significant value as most services and equipments are expected to be rolled out around 2012.

Qualcomm stresses the importance of accelerating the refarming of the 900 and 1800 MHz bands and clarifying the corresponding process in order to allow operators to take informative decisions about bidding on additional spectrum bands, especially sub-1GHz spectrum bands. This would allow operators to assess risks and opportunity correctly and ultimately would allow appropriate pricing of the digital dividend, which in turn is of interest to the customer.

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?

Qualcomm believes that PMSE devices should be relocated to lower parts of the band and that channels 69 should be cleared (even if a short transition period is required to do so) and made available as cleared spectrum on a nationwide basis.

Qualcomm believes that the value of the 806-854MHz sub-band lies in the harmonization across Europe of the whole 790-862MHz band for mobile communications. The CEPT is currently developing a harmonized band plan for the 790-862MHz band. Harmonization allows the design of cost effective equipment in a timely manner and is a prerequisite to commercial success for mobile communication services. The social value of the 806-854MHz sub-band for UK citizens will be significantly degraded if channel 69 is not cleared on a nationwide basis.

Qualcomm believes that PMSE devices should be migrated to the interleaved spectrum below 790MHz. Qualcomm believes that the cost of migrating the PMSE devices is significantly lower than the economic and societal benefits associated with the availability of the whole 790-862MHz band for mobile communications.

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

Qualcomm believes that the value of the 790-862MHz sub-band lies in the harmonization across Europe of the whole 790-862MHz band for mobile communications. The CEPT is currently developing a harmonized band plan for the 790-862MHz band. Harmonization allows the design of cost effective equipment in a timely manner and is a prerequisite to commercial success for mobile communication services.
Qualcomm is in favor of pan-european approach and methodology to manage interference. The technical conditions of access to the band should be consistent with the technical conditions resulting from the on-going EC/CEPT harmonization process. Specifically, TLCs should be aligned with the result of the studies conducted by the ECC TG4, ECC SE42 and ECC PT1 to define an appropriate harmonized band plan and appropriate harmonized technical conditions of access to the band. Qualcomm is contributing to these studies and is fully committed to the harmonization process.

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?

Qualcomm is in favor of pan-european approach and methodology to manage interference. The technical conditions of access to the band should be consistent with the technical conditions resulting from the on-going EC/CEPT harmonization process. Specifically, TLCs should be aligned with the result of the studies conducted by the ECC TG4, ECC SE42 and ECC PT1 to define an appropriate harmonized band plan and appropriate harmonized technical conditions of access to the band. Qualcomm is contributing to these studies and is fully committed to the harmonization process.

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

Qualcomm is in favor of pan-European approach and methodology to manage interference. The technical conditions of access to the band should be consistent with the technical conditions resulting from the on-going EC/CEPT harmonization process. Specifically, TLCs should be aligned with the result of the studies conducted by the ECC TG4, ECC SE42 and ECC PT1 to define an appropriate harmonized band plan and appropriate harmonized technical conditions of access to the band. Qualcomm is contributing to these studies and is fully committed to the harmonization process.

Qualcomm would like to underline that it has been demonstrated in ECC reports 21, 22 and 23 (CEPT responses to the EC mandate on digital dividend) that guard bands are not required between DVB-T services, Mobile Multimedia Services and mobile communication FDD Downlink services.

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?

Qualcomm is in favor of pan-European approach and methodology to manage interference. The technical and regulatory conditions of access to the band should be consistent with the technical and regulatory conditions resulting from the on-going EC/CEPT harmonization process. Specifically, TLCs should be aligned with the result of the studies conducted by the ECC TG4, ECC SE42 and ECC PT1 to define an appropriate harmonized band plan and appropriate harmonized technical conditions of access to the band. Qualcomm is contributing to these studies and is fully committed to the harmonization process.

Qualcomm believes that the results of CEPT studies will provide the OFCOM with the appropriate solution to prevent interference to existing DTT services.

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?

Qualcomm believes that indoor and set-top box antennas are unpredictable in terms of performance and placement. The issue has been raised and is currently studied by the ECC TG4. Qualcomm recommends OFCOM to take the result of these studies into account. The result of these studies should be applied on a national basis.

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

Qualcomm is in favor of pan-european approach and methodology to manage interference. The technical and regulatory conditions of access to the band should be consistent with the technical and regulatory conditions resulting from the on-going EC/CEPT harmonization process.

Qualcomm would like to underline that it has been demonstrated in ECC reports 22 and 23 (CEPT responses to the EC mandate on digital dividend) that a separation of one channel between broadcast and uplink mobile services was sufficient to manage interference. The ECC TG4 did not find any requirement for two channels of separation between broadcast and uplink mobile services.

Question 16: Do you have any comments on the transmit masks set out in paras 5.130 to 5.132?

Qualcomm is in favor of pan-European approach and methodology to manage interference. The technical and regulatory conditions of access to the band should be consistent with the technical and regulatory conditions resulting from the on-going EC/CEPT harmonization process. Specifically, TLCs should be aligned with the result of the studies conducted by the ECC TG4, ECC SE42 and ECC PT1 to define an appropriate harmonized band plan and appropriate harmonized technical conditions of access to the band. Qualcomm is contributing to these studies and is fully committed to the harmonization process.

Qualcomm believes that CEPT work should be taken into account and that it is premature to adopt national measures regarding the masks.

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?

Qualcomm agrees 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.

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?

Qualcomm believes that the value of the 790-862MHz sub-band lies in the harmonization across Europe of the whole 790-862MHz band for mobile communications. The CEPT is currently developing a harmonized band plan for the 790-862MHz band. Harmonization allows the design of cost effective equipment in a timely manner and is a prerequisite to commercial success for mobile communication services.
Therefore, Qualcomm believes that there is a strong need to avoid mixing high power (broadcast) and low power (mobile communication) in the 790-862MHz sub-band. Qualcomm strongly recommends OFCOM to avoid implementing a flexible FDD/TDD band plan. Qualcomm urges OFCOM to implement the harmonized CEPT defined band plan.

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

Qualcomm believes that the value of the 790-862MHz sub-band lies in the harmonization across Europe of the whole 790-862MHz band for mobile communications. Qualcomm believes that the availability of the whole 790-862 MHz sub-band for harmonized broadband mobile networks maximizes the economic and societal value of the sub-band for the UK and UK citizens. Therefore, with regards to spectrum lots, Qualcomm has the following recommendations:

- The economic and society value of broadband mobile networks in the 790-862MHz band lies in the unique opportunity for nationwide coverage due to the favorable propagation conditions in this band. Such nationwide wireless broadband networks are seen as a key for economic national competitiveness and reduction of the digital divide between urban and rural areas. Qualcomm underlines that the 790-862MHz sub-band would benefit from FDD technologies to ensure maximum coverage as the value of this sub-band lies in achieving ubiquitous wireless internet access.
- Qualcomm believes that it the lots should be defined based on CEPT band plans. Qualcomm expects the CEPT band plan to be defined based on 5MHz blocks. Therefore, Qualcomm recommends the OFCOM to package the 790-862MHz lots in 5Mhz blocks.
- International restrictions arising from GE-06 and potential subsequent international coordination agreements are likely to substantially affect the relative value of spectrum lots. These restrictions will directly impact the cost of network deployment for vast and populated areas, e.g. south east of England. Therefore, at least during the second round of the cleared spectrum auction, the spectrum lots should become fully frequency specific.
- Some UK neighboring countries (e.g. France) are expected to request bilateral coordination with the UK to ensure the availability of the 790-862MHz band for broadband mobile networks in their own territories. Qualcomm sees this upcoming request for coordination by UK neighbors countries as an opportunity for UK to clear a 72MHz sub-band (790-862 MHz).

With regards to TDD TLC types:

- Qualcomm believe that CEPT studies results should be taken into account to define TDD TLCs lots.
- Qualcomm agrees that TDD blocks should be 5 MHz wide.
- Qualcomm believes that TDD systems should have the option to align with a proposed CEPT band plan, which does not seem to be the case at the moment due to the unavailability of channels 61, 62 and 69. This would significantly limit the equipment availability and therefore harm the value of TDD lots. As such, Qualcomm believes it is a biased approach against TDD technologies.

With regards to FDD TLC types:

- Qualcomm agrees that FDD blocks should be 5 MHz wide. Qualcomm recommends adopting a 12 MHz duplex gap. Qualcomm recommends duplex spacing of at least 30 MHz to avoid terminal desensitization.
- Qualcomm believes that FDD systems should have the option to align with a proposed CEPT band plan, which does not seem to be the case at the moment due to the unavailability of channels 61, 62 and 69. This would significantly limit the equipment availability and therefore harm the value of FDD lots. As such, Qualcomm believes it is a biased approach against FDD technologies.
- Qualcomm believes that the value of spectrum lots is likely to be significantly different depending on whether the band plan is aligned with CEPT proposed band plans or not.

- Qualcomm believes that mixing FDD and TDD technologies in the 790-862MHz band should be avoided to maximize the societal and economic value of the band. Furthermore, should OFCOM decide to provide spectrum for both TDD and FDD technologies in such a small band plan, Qualcomm believes that the impact of terminal to terminal interference on the value of the spectrum lots (and the related terminal filtering requirements) is likely to be much more important than the impact of base station to base station interference. Therefore, the value of FDD lots is likely to depend heavily on the full results of the auction. Bidders should be allowed to bid on very specific and precise categories, which are not fully reflected in current lots. E.g. it is clear from the result of 2.6GHz auctions in Norway and Sweden that 5 MHz blocks at the border between FDD and TDD have significantly less value that spectrum blocks inside the FDD/TDD band.
- Qualcomm notes that Figure 7.5 seems to indicate that the ECC TG4 is responsible for the definition of a band plan and that potential UK channels would align with a harmonized band plan. Qualcomm would like to underline that ECC PT1 is responsible for harmonized band definition. Furthermore, should channels 61, 62 and 69 not be cleared on a nationwide basis, then the potential channels in the UK are unlikely to align with the channels in the CEPT harmonized band plan.
- Qualcomm underlines that FDD terminals would rely on filters to remove interference from DVB-T signals in channels 61 and 62. OFCOM's proposal to allocate channels 61 and 62 to extra downlink would require an additional UK-specific filter in the terminal which would be used only in areas where both channel 61 and 62 are free. The cost of such UK specific equipment is likely to be very high and to put UK citizens at a disadvantage with regards to other European citizens benefiting from harmonized equipments.

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?

Qualcomm believes that the value of the 790-862MHz sub-band lies in the harmonization across Europe of the whole 790-862MHz band for mobile communications. Therefore, Qualcomm believes that lots should be defined to align with the harmonized CEPT band plan. Qualcomm expects the CEPT band plan to be defined based on a 5MHz raster.

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?

As illustrated by 7.9 and 7.10, the proposed auction mechanism would result in a significant number of potential outcomes, which in turn leads to UK-specific equipment instead of European-wide harmonized equipment. This will significantly hurt the consumer benefits of the digital dividend.
Regarding the upper band, Qualcomm suggests to limit the possible outcome of the auction to the harmonized band plans that will be defined by the ECC PT1. This will significantly simplify the auction process for the upper band and guarantee the availability of mass market equipment benefiting from economies of scale.

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

Qualcomm agrees with the OFCOM proposal to proceed on the basis of UK-wide lots.

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?

Qualcomm believes that the value of the 790-862MHz sub-band lies in the harmonization across Europe of the whole 790-862MHz band for mobile communications.
Therefore, Qualcomm believes that FDD and TDD lots definition in the 790-862 MHz band could be restricted to the options proposed by the harmonized band plan under study in the ECC PT1. This would very likely simplify the auction.

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.

Regarding the 790-862MHz band, the potential multiplication of interfaces would both reduce the efficiency of use of spectrum and remove the possibility to use harmonized mass-market equipment in UK. Harmonization allows the design of cost effective equipment in a timely manner and is a prerequisite to commercial success for mobile communication services.
Qualcomm recommends limit the auction options for the 790-862MHz to the harmonized band plan defined by the CEPT.

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

Qualcomm agrees with OFCOM's proposals to include an information provision license condition to help facilitate efficient secondary trading.

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?

Qualcomm stresses the importance of accelerating the refarming of the 900 and 1800 MHz bands and clarifying the corresponding process in order to allow operators to take informative decisions about bidding on additional spectrum bands, especially sub-1GHz spectrum bands. This would allow operators to assess risks and opportunity correctly and ultimately would allow most effective award of the digital dividend, which in turn is of interest to the citizen.
The availability of the 790-862MHz band may offer additional options for the OFCOM to resolve the refarming competition issues of the 900MHz band as both bands present similar propagation characteristics.
