

# **Digital Dividend: 600 MHz band and geographic interleaved spectrum Intellect Response April 2010**

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## Introduction

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Intellect is the UK trade association for the technology industry which comprises the information and communications technologies (ICT), electronics manufacturing and design and consumer electronics (CE) sectors, including defence and space-related IT. We are formed by 780 Small to Medium Sized Enterprises (SMEs) and multinational member companies with interests in these sectors and exist solely for their benefit. Over the last 12 months, we have hosted 550 meetings attended by 3,486 people visiting our London offices and hosted 60 events for our member companies. 3,900 delegates have attended conferences we have organised in the past year. The industries that Intellect represents contribute at least 10% of the UK's GDP, employ approximately 5m people and contribute £120 billion to the UK economy. Some of the companies involved in our work in relation to spectrum are shown in Annex One to this response.

### **1) Do you have any comments on the application of the protection clause to all new licenses for the 600 MHz band and geographic interleaved spectrum?**

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Intellect agrees with Ofcom that there is a risk of harmful interference arising as result of out-of-band emissions from new services that may be introduced in the 600 MHz band and geographic interleaved spectrum if the appropriate technical rules are not developed and implemented to protect DTT platforms from these out of band emissions.

Furthermore, we support the general reasoning behind the introduction of such a clause in the context of the 600 MHz band. There is a need to ensure that if mobile services were introduced, the adjacent broadcast services are able to co-exist in the context of an evolving broadcasting network. Without a protection clause, it is unlikely that co-existence could be catered for as harmful interference could result from DTT services originating from new, rather than existing, sites.

We note also the complexity of the “protection clause” work that Ofcom is undertaking to protect DTT services from any new services that will be deployed in the 800 MHz band within the UK. This complexity is mitigated to some extent by the expected harmonised allocation in the 800 MHz across Europe. This facilitates development of economic and standardised solutions that can be implemented in both mobile broadband and DTV technology, reducing complexity and uncertainty for consumers.

In addition, there have been a range of measures proposed by the European Commission that could increase the opportunity for further digital dividend spectrum. These have included the mandating of new compression standards (specifically the H.264 encoding/compression standard) across the EU. The Commission has also promoted the initiation of standards work on DTT resistance to interference. It is clear that the European Commission has ambitions to follow this path and whilst we wholeheartedly support these efforts, we encourage Ofcom to pay full attention to them in the course of the development of further digital dividend releases in the UK.

We urge Ofcom to avoid a UK specific allocation of further cleared digital dividend spectrum that is misaligned with further developments across Europe.

### **2) Do you have any comments on our approach to technical licence conditions for the 600 MHz band and geographic interleaved spectrum?**

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In the cleared 600 MHz band, if non-broadcasting applications were to be advocated, we believe that a European harmonised approach plan would provide a powerful framework and facilitate the development of an appropriate complementary specification for DTV receivers. This may be more effective than any increase in frequency separation for mobile transmitters which itself may not resolve the interference challenges due to close proximity in a nationally specific band arrangement.

In interleaved spectrum it may be more difficult to resolve the in-band interference potential to DTT services from new services. This could suggest that it might be more appropriate to allocate interleaved spectrum to services that exhibit similar characteristics to the mainstream DTT services.

### **3) Do you have any evidence using frequency offsets with DVB-T2 EC signals might have an adverse impact on uses of adjacent interleaved spectrum?**

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Intellect has no evidence with which to make an accurate comment on this topic. Experience in the use of frequency offsets on DVB-T indicates that some considerations need to be made with frequency planning. Intellect agrees that current conventions and the UK implementation plan deal adequately with the existing multiplexes, and urges Ofcom to examine in more detail the potential impact of additional multiplexes in geographic interleaved spectrum.

### **4) Do you have any evidence mobile services using the 600 MHz band and geographic interleaved spectrum could cause harmful interference to cable television?**

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We agree that operation of two-way mobile devices in close proximity to, and on a co-frequency basis with, cable television receiving equipment may be troublesome.

Further, we note and concur with the Ofcom view that, currently, these concerns over the potential for harmful interference have arisen from the future use of new mobile devices in the 800 MHz band, and the impact they might have on cable service receiving equipment.

There is a need for further assessment of the risk of interference between mobile broadband services in the cleared 600 MHz band and geographic interleaved spectrum and co-frequency cable services that make use of the 600 MHz band. We also note that the 600 MHz band is currently not harmonised for use by mobile across Europe, which has a significant impact on the prospects for deployment of mobile services within it in the UK.

### **5) Do you have any comments on protecting PMSE in Channel 38?**

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Intellect has no comment to make on this question.

### **6) Do you have any comments on non-technical licence issues and the way we propose to approach them?**

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Intellect fully supports the licence conditions that are being proposed by Ofcom. We are particularly pleased to see that licences in the 600 MHz band will be tradable, which we will believe will significantly assist the growth of a secondary market for spectrum in the UK. It is important that information that an entity may need to consider in determining whether to

lease spectrum is made available, and 600 MHz licenses should require that. We also fully concur that 600 MHz spectrum should be licensed in a technology and service neutral manner.

We would appreciate further clarity from Ofcom over the process by which fees for the initial licence term might be “set through the award processes”, and that the basis of “further fees after the initial term” would be reflective of any changes that result from the on-going strategic review of spectrum pricing.

### **7) Do you have any comments on our assessment of the most likely uses of the 600 MHz band and geographic interleaved spectrum? Are there any potential uses we have not mentioned that should be considered?**

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Intellect believes that Ofcom have accurately captured uses for this spectrum that would add most value for the citizen and consumer. Furthermore, we agree that within the range of uses identified, it is DTT and possibly mobile (or fixed) broadband that are the most suitable applications for this particular band, although the lack of harmonised availability of the spectrum is problematic in the case of mobile broadband. We concur that, in the context of Mobile Broadband, it is likely that new technologies would be likely to need channel sizes of greater than 10 MHz in order to operate.

Within this context, it has become increasingly clear to us that the Digital Dividend as understood in the both the UK and the broader EU context (the band 790-862 MHz) is not on its own going to be sufficient to support the demand for fixed and mobile broadband applications in the long term. Other spectrum bands (including those above 1GHz) will also be needed. According to Ofcom’s own figures, more than eight million people now access the internet on a mobile device and the number is growing. Given such huge growth, Intellect believes that Ofcom needs to design the spectrum award so that wireless broadband is a potential use in the awarded spectrum as well as DTT. As the European Commission has recommended, consumer equipment is gradually migrating to more efficient compression technologies such as DVB-T2, which would increase the capacity for broadcasting within the spectrum to be awarded as well as the spectrum retained for the DTT platform.

The 600MHz band could provide additional terrestrial digital TV broadcast capacity. Its early availability for this application would support and be consistent with Ofcom’s recent decisions in relation to wholesale availability of Sky’s premium content by providing an additional delivery mechanism for such content as well as to support the delivery of other TV programmes and services.

Likewise, Ofcom needs to consider use of this spectrum in the context of the current, and potentially future, Government’s, objectives in broadband coverage. If Next Generation Mobile Broadband Services are to play a role in providing Next Generation Access Broadband to the UK, spectrum needs to be made available. Current allocations simply are not sufficient.

As alluded to, whilst we believe that an option for mobile broadband in the 600 MHz band could be included, there is also a corresponding need for further assessment of the risk of harmful interference from mobile broadband devices that might potentially operate in the band to cable set-top boxes. Ofcom should support further study and measurements being carried out at European, rather than member state, level in order to avoid duplication and potentially divergent interpretations of results. These studies should actively involve industry, and they should ensure immunity of existing services to new mobile broadband signals, starting with the coexistence of television reception in presence of mobile broadband signals in the Digital Dividend band. The European Telecommunications Standards Institute (ETSI)

would be a good platform for such tests and measures as:

- It has test and measurement expertise, which is available to third parties
- It is responsible for the European contribution to 3GPP
- It endorses DVB transmission specifications to make them into Television standards for Europe.

Ofcom will need to be cognizant of the fact that there are already approximately 18,200,000 homes using DTT receivers in the UK alone which need to be protected against interference from new mobile broadband signals in the Digital Dividend band and, subject to further investigation, any new mobile broadband applications that operate in the 600 MHz band. In the longer term, Ofcom should acknowledge the significant potential of 3D TV, which has been demonstrated by the success of 3D Films shown in cinemas. There may be a need for new category of 3D TV broadcast services.

We also note the objective outlined in the Commissioner's Digital Agenda, that all Europeans should by 2020 have access to internet speeds (30Mbps or more) and 50% or more of European households should be able to receive a service 100Mbps. Fibre-based technologies are likely to provide the majority of the connectivity needed to meet the latter objectives, as they are able to support such speeds on a more consistent basis. However, there will be a role for satellite and terrestrial wireless to play, especially in remote and rural areas. If wireless is to play a role in terms of meeting the EU's objective significantly more pan-European bandwidth than the 72 MHz currently envisaged through the digital dividend is necessary. In addition, whilst we believe that there is potential for further spectrum to be made available for new uses below 790 MHz, it would be important for the Commission to ensure that it adopts, early on, appropriate channelisation requirements that can support a range of applications and technologies.

The European Commission proposed, in its Communication on the Digital Dividend to the Parliament and the Council, to create an additional sub-band immediately adjacent to the Digital Dividend for mobile use as well as, potentially, for broadcasting. This new sub-band would be optimal for mobile use due to potential for future pan-European harmonization and would foster further competition between broadcasting and mobile for access to the digital dividend. The downside of the proposal is that it may limit the potential for further development of the DTT platform to accommodate more HD, 3DTV, etc as consumer demand develops. In addition, the cost and practicality of this proposal (such as interference to DTT services) have not been assessed, while the likelihood and timeframe to achieve such a harmonized approach in Europe is unclear. Intellect considers that thorough studies should be conducted, but urges Ofcom to work diligently to avoid a delay in bringing the cleared spectrum to market.

We also note Ofcom's recognition of the fact that there is potential for use of the 600 MHz band for emergency services applications. We believe that additional bandwidth will also be necessary to facilitate ensure mobile broadband access for Public Protection & Disaster Relief (PPDR) across Europe. Provision of improved access to information for first responders via a mixture of voice, data and video is key in terms of improving the capabilities of our emergency services. Mobile broadband is not just for consumers to enjoy, it is for Governments to utilise.

However, we believe that it will be necessary for the relevant Government agencies to outline a firm requirement for a next generation platform for emergency services communications. Whilst there is preliminary work underway, in partnership with Industry, to outline this need, it will be necessary for these agencies to progress quickly to a firmer understanding of their

technical requirements if an objective understanding of the need for future spectrum for the emergency services, and therefore whether future allocations should be made in the 600 MHz band, is to be arrived at.

Intellect agrees that Digital TV broadcasting is a credible use of the spectrum as well as wireless broadband, emergency service use or other applications and this leads us to the conclusion that a reasonable degree of flexibility needs to be built into the design of the award to support the objectives of technology and service neutrality.

## **8) Are there any distinctive considerations and uses for this spectrum in the nations and regions of the UK?**

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Intellect believes that these distinctive considerations will vary according to the application which Ofcom determines would provide most benefit to the citizens and consumer.

In the DTT context, we believe that Ofcom has effectively taken into consideration all relevant issues in its analysis.

In the context of all other potential uses, including mobile broadband, mobile television and the emergency services, we would emphasise that making the 600 MHz band available on a regional and/or geographically constrained basis is likely to attract significantly less interest from commercial users than would be the case if it were released on a national basis. It follows that, in any determination of the mode of release of the band for these application, spectrum should be released in cleared national blocks. Such an approach would undoubtedly lead to greater economic value being attached to the spectrum that is released, lower equipment costs and complexity and, accordingly, greater interest from private sector users in acquiring the rights to make use of it.

## **9) Do you have any comments on our continued inclusion of channel 36 in the award of the 600 MHz band?**

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Intellect concurs with the view expressed with by Ofcom that mobile TV has not achieved the level of penetration that was expected at the time of its 2007 statement. The level of viewing in the UK, as opposed to other countries over the past three years has been lower. In Japan and South Korea, the average mobile TV user watches for an hour or more every time they tune in. In the UK, two thirds of viewers watch for only 30 minutes<sup>1</sup>. Recent offerings in the UK, have not gained a huge amount of traction. It is also apparent that the headline downlink and uplink speeds offered through the 3G technology currently in use by the majority of the Mobile networks in the UK are often not sufficient to support the exponential increase in video traffic due to the limited spectrum available.

However, it is likely that this situation is already changing in the U.K. as a result of a number of market innovations and through more spectrum being made available and awarded. There are a range of devices that have come to market in the past year that combine increased screen size and simplicity of use. There is already a significant amount of spectrum that could potentially be used for mobile TV allocated. It's also true that 4G networks, which are already being deployed in many parts of the world, will soon start to spawn a new generation of mobile devices. We are aware that many are at the point of launch outside of the UK. With

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<sup>1</sup> *Analog Mobile TV: The World's Most Widely Available Option for Mobile TV* (Telegent Systems, 2009)

the mass-market emergence of these devices, we foresee a significant growth in demand. Its extent will depend, for example, on the innovativeness that broadcasters and content producers show in terms of their business models. The success of the 'pay as you go' model, where customers purchase content on individual basis via 'App Stores' on the internet, could serve as a model in this area.

In general though, we agree with the view that in a single, cohesive award of 600 MHz spectrum would prove most attractive to potential bidders. Auctioning the band as a whole within the same time-frame would facilitate participation of those bidders who wish to make a specific choice about the 'lots' they wish to bid for, based on prices as they evolve. An auction timeframe that does not allow for such considerations to be made is not desirable in the long term. This is particularly so given the increasingly tightening financial constraints that some potential bidders are currently enduring. Ofcom should also ensure that maximising the efficiency of spectrum use, which is in part achieved by placing it in the hands of those who value it most, is built into any auction process. The true economic value of channel 36 would be best determined in the context of how other blocks or channels are valued by bidders over a similar timeframe. Only a single, cohesive, auction of the whole band can achieve this.

#### **10) Do you have any comments on our intention to maintain a market-led approach to awarding the 600 MHz band and geographic interleaved spectrum?**

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Intellect believes that a market led approach to the release of the 600 MHz band should be paramount in all considerations over its potential future use. It is the only manner in which its true economic value can be assessed, and competition and innovation in spectrum allocation maintained. We do not believe that there are sufficient grounds for Ofcom to revise this view.

#### **11) What information can you provide on packaging and award design considerations?**

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Intellect supports an award that could support Digital TV, Wireless Broadband and other applications with flexibility to enable sufficient bandwidth to be acquired. This implies award of the spectrum in small packages that can be aggregated as required and that can support multiples of both 8MHz and 5MHz channels. Awarding the spectrum in 8MHz blocks may be best as these fit neatly into the 56MHz available and multiple 8MHz blocks can support multiple 5MHz channels with small guard bands. Alternatively a flexible auction design that enables the award to determine the block sizes could be envisaged in a similar way to that set out in the previous Ofcom consultations for the broadcasting spectrum awards.

Given the limited bandwidth of 56MHz (before guard bands) this may preclude a paired spectrum option as a substantial percentage of the spectrum would not be useable because of the duplex gap and guard bands that would be needed.

Intellect notes that the consultation paper covers the 600MHz cleared spectrum as well as the geographic interleaved spectrum, but it is unclear whether Ofcom intends to link the auctions for the two types of spectrum. Intellect believes there are benefits in doing so as the ability to acquire both types of spectrum could be useful from a capacity viewpoint, or as a means of providing additional flexibility to mitigate any local interference issues (e.g. possible transmission on the "image channel").

#### **12) When would you like to start operating new services using the 600 MHz band and/or geographic interleaved spectrum?**

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In the case of Broadcasting use (where equipment is already available) an award as early as possible would be important so that spectrum use could commence as early as possible. Even if not fully available nationwide until switchover completes, an early award should enable early use of spectrum leading to more economically efficient use of spectrum and enabling consumers to get earlier availability of new services. In facilitating an early award, Ofcom will need to ensure timely international co-ordination, recognition of European Union harmonisation, protection clause issues and determine licence issues.

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**END OF INTELLECT RESPONSE**

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## Annex One

The Following Intellect Member Companies are involved in our work relating to spectrum policy, allocation and licensing:

Airwave Solutions Ltd  
Analysys Mason Limited  
Arpeggio Ltd  
Arqiva  
Arxan Technologies Ltd  
Astra (GB) Limited  
Astrium Limited  
Avanti Communications Limited  
BAE Systems  
Bird & Bird  
Bluenowhere Ltd  
Brian Jones  
BT Group Plc  
Cable & Wireless UK  
Capgemini UK Plc  
Consult Hyperion  
Consult Hyperion  
Dell Corporation Ltd  
Deloitte  
DeNové Ltd  
Ericsson Limited  
Europa Technologies Limited  
Eutelsat UK Ltd  
Fujitsu  
Gemserv Ltd  
General Dynamics UK Limited  
Geo Networks Limited  
Hardcat Limited  
HP Enterprise Services  
Huawei Technologies (UK) Co Ltd  
Hughes Network Systems Ltd  
IBM United Kingdom Limited  
Inmarsat Global Limited  
Intel Corporation (UK) Ltd  
Launchpad Europe Ltd  
Logica  
Microsoft Ltd  
Microsoft Ltd  
Motorola Ltd  
Mott MacDonald Limited  
Nokia (UK) Ltd  
Nokia Siemens Networks UK Limited

Olswang  
Panasonic UK Ltd  
Paradigm Services  
Plextek Ltd  
Progress Software Ltd  
QinetiQ Group  
QUALCOMM  
REC sp.z.o.o.  
Research in Motion UK Limited  
RJD Technology Ltd  
Roke Manor Research Limited  
Samsung Electronics UK Ltd  
Sapient Ltd  
SELEX Communications Limited  
SELEX GALILEO  
Sony Manufacturing UK Ltd  
Sony United Kingdom Ltd  
Sony United Kingdom Ltd  
Thales Plc  
Thales Plc  
UK Broadband Ltd  
Vecta Consulting Ltd  
VEGA  
Verint Video Solutions UK Ltd  
Wireless Economics Limited