

# Digital Dividend Review

A Plain English Summary of the Consultation

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# Foreword

This review is about one of the most important decisions we (Ofcom) have ever had to make – how to release the spectrum (or airwaves) freed up by the digital switchover for new uses.

The radio spectrum is very important in the modern world. It is the essential input into every type of wireless service – from satellites and radars to broadcasting and mobile communications.

In the UK, uses of the radio spectrum account for nearly one pound in every 30 in the economy, and it is becoming more important. Consumers are using more and more wireless products, and people developing these new products are competing faster and faster to provide them. But the radio spectrum is a scarce resource in very short supply, so how it is managed is a vital issue.

The digital dividend is, quite simply, one of the largest releases of valuable spectrum that is likely in the UK for many years. The spectrum is particularly useful because it is at lower frequencies – allowing large areas to be covered at lower cost, and helping signals to pass through the walls of buildings.

Our main duty is to protect the interests of citizens and consumers. To do this, we must use the spectrum in the best way possible. These duties (among others) define our main aim for the digital dividend review – to make sure society benefits from the digital dividend as much as possible.

So how should we go about achieving this goal?

To answer this question, we have looked at the different possible uses of the spectrum – and the different ways in which they could bring value to us as citizens as well as consumers. We have looked at possible sources of value to society, for example, mobile broadband, local TV, and high-definition television. This has included thinking about the ways that wireless services can contribute to our lives as citizens.

We have also thought about the relationship between the choices to be made on the digital dividend, and how regulations should be suitable for the digital age.

Our analysis is set out in this document. Two points stand out.

The first is that it is clear that there are many different possible uses – and combinations of uses – of the digital dividend. We can be confident that the value of the resource as a whole is large, but there is significant uncertainty over the value of individual uses.

We as a regulator simply cannot know the best uses of the digital dividend over the next couple of decades. What we can do is to create a framework for those uses.

The second point is that there are some possible uses and users of the spectrum that could bring extra value to society. In each case, this value to society could be delivered in a variety of different ways – some using the digital dividend, but some using other spectrum or other platforms, such as wired broadband or satellite television.

Our evidence suggests that local television could bring wider benefits to society, as long as it is popular and not too local. But more and more platforms can now deliver local digital content, including wired broadband and satellite. These options all have different advantages – and all need to be considered by possible funders and operators.

The same is true of high-definition television. It is possible that this will become the new standard for broadcasting – consumers may come to expect public-service broadcasting in high definition, just as they do now in colour. However, most research suggests that high-definition television is seen as a premium consumer product, rather than a significant source of value to society as a whole. Attitudes may change, of course, but we do not know how or when, and even if they do, there are many different ways of delivering high-definition television – of which this spectrum is only one.

This second point is more complicated.

- It is vital that possible users of the spectrum whose goals are social – like public-service broadcasters – can get access to the spectrum if this is the best way of meeting their aims.
- But it is equally important that the decisions they make about which platforms to use, and which spectrum, are not affected by bad regulation.

All possible users of the spectrum need to have strong incentives to make the right choices about the spectrum they use – choices that are, as far as possible, good for society, not just good for the individual user.

We will get the framework for the digital dividend right if we get the incentives right.

In the past, regulators and governments have used the spectrum as part of their policy – ‘setting aside’ the spectrum for preferred uses and users to help to deliver particular policy goals. Some have argued that we should take the same approach to the digital dividend – ‘setting aside’ the spectrum to preferred uses or users that we should select.

But we do not think this approach is right in the digital age. There are many reasons for this, but the most important is related to how we create the right framework with the right incentives to use the spectrum in the best way possible. If we pick preferred uses and users for this vital resource, the following may happen.

- We will distort incentives. Users who get preferred access to the spectrum will have less incentive to use it efficiently, and less incentive to look at alternatives.
- We will reduce flexibility. The more we pick preferred uses, the more we will limit the use of the spectrum to just those uses. This will limit the ability of users to respond – in a sector where there is constant, unpredictable innovation and change.
- We will have assumed that we, the regulator, can predict the future. But we know we can't. We also know that the more we get involved in an area like this, the more likely we are to get it wrong.

So this document proposes that our approach to releasing the digital dividend should be to set as few restrictions as possible on how the spectrum can be used – and to give users as much flexibility as possible in deciding how to use the spectrum.

We also propose that, in almost all cases, the spectrum should be auctioned (that is, sold in a public process to the highest bidder), and users should pay the market price for using it.

This is a market-led approach, and it is consistent with the wider strategy towards the spectrum that we have followed since 2003. That strategy involves moving away from command and control – with the regulator deciding who can use the spectrum, how and for what – to give users flexibility, and limit regulation to what is essential.

The document also proposes that the right answer for organisations with broader social goals – like the public-service broadcasters – is not to get involved in the way that the spectrum is managed.

Instead, we need to make sure that these organisations work within a financial and institutional framework that makes sure that they can gain access to the spectrum if this is the best use of their resources in achieving public-service aims.

Our view is that work on this is an essential part of changing the way the spectrum is managed. The Government recognised this in its response to the Independent Audit of Spectrum Holdings, which looked at public-sector spectrum holdings outside broadcasting earlier in the year. We are committed to supporting the Government's work.

This document includes many other proposals that are important. To name just a few, it sets out our thoughts on:

- reducing the amount of regulation that applies to using wireless microphones (which are important in public events such as sports and theatre), and managing the new arrangements after the switchover;
- ways in which the spectrum could be packaged, to make it accessible to the many possible users, and create opportunities for both smaller and larger buyers; and
- the timing and design of the proposed awards of the available spectrum.

We encourage all stakeholders and interested people to consider all the proposals carefully, and to respond to our consultation.

**David Currie**  
Chairman

**Ed Richards**  
Chief Executive

# Executive summary

- 1.1 The radio spectrum is a scarce resource of enormous importance in the modern world.
- 1.2 In the UK, uses of the spectrum like mobile communications and broadcasting account for about 3% of the economy – more than the electricity and water industries combined. The spectrum is also an essential input into numerous public services – from defence to the emergency services, and from scientific research to transport.
- 1.3 The demand for spectrum is growing fast. This reflects the development of new wireless technologies and applications of many different kinds. It stems from the fact that wireless services have unique features that are valued by almost everyone – like mobility and convenience.
- 1.4 The rising importance of the spectrum means that the way that it is managed is a vital issue for advanced economies around the world. So, one of our most important aims is to make sure that using the spectrum brings as many benefits as possible to the UK's citizens and consumers.
- 1.5 This consultation is about how we should achieve this by releasing one of the most valuable spectrum bands likely to be available in the near future – the digital dividend.

## The digital dividend

- 1.6 The spectrum is made up of a range of radio frequencies – from the very low to the very high. At very low frequencies, signals travel a long way, but they cannot carry a lot of information. At very high frequencies, the signals do not travel far, but they can carry a lot of information.
- 1.7 The most attractive spectrum offers a combination of range (propagation) and capacity (bandwidth) that makes it suitable for lots of different uses. Good propagation means that less equipment is needed to provide coverage, which reduces cost and improves service in buildings and in rural areas. Good capacity means that the signals can be used for services that involve carrying lots of information to lots of users – like high-quality voice, data and video.
- 1.8 It is generally agreed that the most valuable spectrum in the UK is between around 200 megahertz and 1 gigahertz – which offers just this combination of range and capacity. At the moment, nearly half of this spectrum is used to broadcast analogue television – 368 megahertz, or 46%, of the 800 megahertz.
- 1.9 The use of the spectrum for this purpose dates back to the decades after the Second World War, when television was first made available on a large scale and preparations were made for introducing broadcasting in colour. The spectrum was used far less than it is now, and as a result, more spectrum was used than was perhaps necessary, to keep costs down.
- 1.10 The UK's analogue television signals will be switched off, region by region, between 2008 and 2012. In principle, this means that all 368 megahertz might be available for new uses, but the Government has decided that 256

megahertz of the 368 megahertz should be used for digital terrestrial television (DTT) from digital switchover. This digital broadcasting will be provided by six multiplexes, each of which can carry a number of television channels and some other services.

- 1.11 This decision will allow digital terrestrial television to expand its coverage – to match that of analogue, at 98.5% of the population – and its capacity – to around 10 times that of analogue in most of the country, and around five times elsewhere.
- 1.12 At the same time, the digital switchover will allow the rest of the spectrum – 112 megahertz – to be released for new uses. It is this 112 megahertz that forms the core of the ‘digital dividend’.

### Different types of spectrum

- 1.13 In fact, there are three different sorts of spectrum that are available for release, and we have been considering all three in the digital dividend review.
- 1.14 All of these frequencies are in that part of the radio spectrum known as UHF, or ultra high frequency – a name that dates from the days when the higher frequencies were not used very often. (This has now changed, but the UHF spectrum is still exceptionally useful.) In Europe, the UHF band is divided into channels of 8 megahertz each, with the part often used for broadcasting ranging from channel 21 at the bottom to channel 69 at the top – or 470 megahertz to 862 megahertz.
- 1.15 The three sorts of spectrum are as follows.
  - The **112 megahertz** mentioned above. This is made up of the parts of the spectrum that will be **cleared** as a result of the digital switchover, and that will be available throughout the UK for new uses. This 112 megahertz includes 14 channels of 8 megahertz, which is presently used for analogue television, and also for wireless microphones. After the switchover, this spectrum will no longer be available for analogue television or wireless microphones to use.
  - Two **other blocks of the spectrum** that are used for other things, but could **be cleared**. These are channel 36 and channel 69. Channel 36 is currently used for airport radar, and channel 69 mainly for wireless microphones. In both cases, it was sensible to review the future use of this spectrum at the same time as the rest of the band. Including these two blocks means that there is a total of **128 megahertz** potentially available as cleared parts of the spectrum.
  - Then there is the **interleaved** spectrum. This is capacity that will be available within the frequencies that will be used to carry the six DTT multiplexes, which together will carry the digital television services available in the UK. It is effectively ‘white space’ (or unused spectrum) that exists geographically between the transmitters needed for those six multiplexes.
- 1.16 In this document, these three categories of spectrum – the cleared, the potentially cleared, and the interleaved – are referred to as the **available UHF spectrum**, or the **digital dividend**.

## Potential uses and users

- 1.17 We have identified many possible uses for this spectrum. But it is important to recognise that we cannot identify all the possible uses. It is very likely that there will be more uses in the future, as technology changes and companies create new products. The benefits of these unknown uses could be as large as, or larger than, the benefits of uses that we can identify now.
- 1.18 The main uses we can identify as possibilities now are:
- **mobile television** – and other types of mobile video and multimedia;
  - **digital television** channels aimed at a national market, which could be in:
    - **standard definition** (SD) like terrestrial services broadcast now; or
    - **high definition** (HD);
  - **digital television** channels aimed at a local market – **local television**;
  - **wireless microphones**, and other programme-making and special-events (PMSE) applications, like in-ear monitors;
  - **broadband wireless** applications – which could also be mobile;
  - **mobile communications** – services like voice and data;
  - **low-power applications** – like devices to distribute content around the home;
  - services using **satellite** communications; and
  - **public-safety services** – like applications for the emergency services.
- 1.19 But this is not a complete list, and even within this list there is a wide range of factors that could affect the use of the spectrum. These include different standards or technologies that could be used, different areas that could be targeted, different services that could be offered, and different user groups that could be served.
- 1.20 As a result, among the issues covered in this document are the relevance of this spectrum to the **rural coverage** of many services, and the way in which improved television services could be provided to viewers with **particular needs for accessibility**.
- 1.21 There is an even wider range of **possible users** of the spectrum than there is of uses – many different operators of many different services. And it can be argued that the different character of these organisations could also be relevant – such as whether they belong to the public, private or voluntary sector.

## Aims and approach

- 1.22 Our aim in releasing the digital dividend is to maximise the value that the use of this spectrum is likely to bring to society over time.

- 1.23 In the past, the use of the radio spectrum has been controlled by regulators in the UK and around the world. Regulation has been ‘command and control’ in style – with the regulator controlling who may use the spectrum, what services they may provide, and what technologies they may use.
- 1.24 This approach is no longer fit for the modern age. Many studies have shown how regulating the spectrum has made it less flexible. Both competition and innovation have been damaged – as new companies and new technologies have both struggled to gain access to markets.
- 1.25 The use of the spectrum is so important in the economy that too much regulation has very large costs. One study for the European Commission has estimated that reducing spectrum regulation could bring extra benefits worth €9 billion every year to the European Union economy ([http://ec.europa.eu/information\\_society/policy/radio\\_spectrum/docs/ref\\_docs/secontrad\\_study/secondtrad\\_final.pdf](http://ec.europa.eu/information_society/policy/radio_spectrum/docs/ref_docs/secontrad_study/secondtrad_final.pdf)). Other studies in the US have shown similarly large effects.
- 1.26 Since Ofcom was set up at the end of 2003, we have worked to change the way the spectrum is managed – to allow users much more flexibility to decide how the spectrum is used, for what and by whom. We are doing this by reducing regulation and making much more use of market mechanisms (that is, letting the market rather than the regulator decide on the best uses of the spectrum) and:
- allowing parts of the spectrum to be traded from one user to another;
  - removing the restrictions that limit use to particular technologies or services;
  - releasing parts of the spectrum that are not used; and
  - cutting regulation, where appropriate, by reducing the need for licences to use the spectrum.
- 1.27 At the same time, we recognise the important responsibilities of regulation – to prevent one use of the spectrum interfering with another, and to make sure there is fair and effective competition. We also recognise that in the past, the way the spectrum is used has been linked directly to public policy goals – and that the move from one model of command and control to another needs careful thought and preparation.
- 1.28 How do we maximise the value to society from the digital dividend? To help us answer this question, we have carried out a large amount of analysis and research over the course of this year. The results of that work are set out in this document, in the annexes and in a number of accompanying documents.
- 1.29 The main parts of our work have included:
- technical analysis of the ways in which the spectrum could be used;
  - thorough research into consumers’ interest in various possible uses;
  - assessing the potential demand for different services;

- modelling the likely value of the spectrum to consumers and businesses and society more generally; and
- considering the options for packaging the spectrum and designing an auction.

## Analysis

1.30 Some main points stand out from the work we have done.

We know the value of the spectrum is large – but the value of any one use is uncertain.

- 1.31 We estimate the total value of this spectrum to consumers and businesses at £5 billion to £10 billion, but the figures are uncertain. Please note that this is not an estimate of auction proceeds, but a figure for the total value to consumers and businesses over 20 years (net present value).
- 1.32 But there is huge uncertainty over the value of the individual uses we have identified. This reflects the uncertainty of fast-moving markets, where changes in technology and consumer choices are unpredictable.
- 1.33 There is also uncertainty over how easily each of the different uses could be provided from a technical point of view. We know that the use of the interleaved spectrum is much more limited than the cleared spectrum – although even this has alternative uses.
- 1.34 We also know that there are some important technical limits on using the cleared spectrum, given the need to protect services using adjacent channels (that is, 8 megahertz channels of spectrum next to a particular 8 megahertz channel) in the UK (mainly digital terrestrial TV), and to respect international agreements. In particular, it is likely to be difficult to use some or all of the spectrum for mobile devices transmitting to networks (uplink). Just how difficult is not certain, but transmissions in the reverse direction should be possible, and it may be possible to use the spectrum in neighbouring bands for any uplink that is needed.

The wider value to society is a significant issue for some uses – but less so for others.

- 1.35 Throughout the project, we have tried to identify all the different ways in which using the spectrum could create value to us both as consumers and as citizens – including value that it is difficult or impossible to measure, such as the possible contributions to broader social goals like community cohesion (that is, the closeness of a community) or cultural self-expression (that is, the ability of different cultures to find ways of expressing themselves).
- 1.36 We have found that there are some potential uses of the spectrum that could bring broader value to society. Local television is one example. Our research with citizens and consumers suggested that local TV could bring broader value to society by making people more aware of what is going on in the community.
- 1.37 Similar issues arise in relation to other services. The research showed people felt that widespread availability of mobile broadband could be of value to

society, for example, in rural areas. More choice on the DTT platform (that is, more choice of digital terrestrial television channels) could also be beneficial to society if the content was good – the quality of content was seen as critical.

- 1.38 In our research, high-definition television was not identified as a major benefit to society. A bigger choice of channels was rated more highly.
- 1.39 It is possible, of course, that attitudes to high definition may change. In time, consumers and citizens may come to expect some high-definition content to be available to everyone free of charge, just as colour is now. But the evidence that this will happen is not strong right now.

Wider value to society can be delivered in many different ways.

- 1.40 We also found, importantly, that there are alternative ways of delivering the value to society that could be provided by these services. Using the digital dividend is just one option among many.
- 1.41 For example, local television – and other types of local digital content – could be delivered by things like broadband and satellite. Terrestrial television is only one option. Similarly, mobile broadband can be delivered using a wide range of different technologies and spectrum bands.
- 1.42 The story is the same for high definition. All broadcasters have a range of options for making their services available in this format – this includes the public-service broadcasters who want to provide it for free. The options for them include:
- using the extra capacity created by improvements to DTT at the digital switchover (equivalent to another multiplex);
  - upgrading the DTT platform; and
  - using free-to-view satellite – quite apart from new platforms like IPTV (television over the internet).
- 1.43 For any service, and any provider, each option will have its own costs, benefits and complications. We found as much uncertainty about the extent to which the digital dividend might benefit society as we did on any other issue.

It is not possible for us as the regulator to ‘know’ the best use.

- 1.44 There is so much uncertainty about the current and future value of different uses of this spectrum to society that we, as a regulator, simply cannot say with confidence what will be the best use of this spectrum in the future. It would be wrong to claim that we could.

### **Strategic options**

- 1.45 So what should we do, given this background?
- 1.46 In the past, regulators and governments have used the spectrum as part of their public policy. Parts of the spectrum have been ‘set aside’ to preferred uses and users as a way of helping to deliver particular policy goals, and

responding to the risk of market failure. Other uses and users have been excluded, and the preferred user has usually had the benefit of access to the spectrum without having to pay a market price.

- 1.47 Some have argued that we should take a similar approach to the digital dividend – and that we should set aside the spectrum to the particular uses or users that they favour, to promote public policy goals.
- 1.48 We have considered these proposals carefully, but we do not think this approach is right in the digital age. There are many reasons for this, but the most important concern is how we, as a society, can benefit from this valuable resource over time.
- 1.49 Using the spectrum as a way of delivering particular policy goals may have been appropriate when the variety of uses was less than it is today – and when there was little choice about how to secure value for society. It is vital that we create a framework for using the spectrum that encourages good decisions about how to use it – and good decisions about how to deliver public services.
- 1.50 Our analysis shows that if we pick preferred uses or users, the following may happen.
  - We will distort incentives. The uses and users that get preferred access will have less incentive to use the spectrum efficiently. They will tend to use too much.
  - We will reduce flexibility. If we pick a preferred use and user when we award the spectrum, we will have to limit the way the spectrum is used. There will be less flexibility in the way that the spectrum can change if circumstances change – for example, if demand for the preferred use turns out to be less than expected, or alternative uses turn out to be more valuable.
  - We will risk distorting competition, because the preferred users may gain an advantage.
  - We will risk getting it wrong, by picking a use or user that turns out not to be the best.
- 1.51 We would prefer to release the spectrum in a way that sets as few limits on how it can be used as possible. Some restrictions are unavoidable, to avoid interfering with other services and to meet international responsibilities. Users should be free to decide how the spectrum should be used, for what, and by whom.
- 1.52 This is a market-led approach to the spectrum, not a regulator-led one. But like all markets, some rules need to apply to how the spectrum is used. So, we will be considering in detail the best way to make sure that releasing this spectrum promotes competition in markets which use the spectrum as an input. We will also look at whether to include conditions in licences that promote competition and guard against anti-competitive hoarding (that is, holding the spectrum without using it).

- 1.53 We have also given a lot of thought to two issues that we think we need to consider in a market-led approach. One is the problem of transaction costs – the fact that some valuable uses of the spectrum involve thousands of users who individually use a small amount of the spectrum, but for whom co-ordinating use could be very costly. This could be particularly relevant to some potential new uses. The other is the risk of disrupting existing users of the spectrum. As most of the digital dividend will be cleared by the switchover, this problem relates mainly to people who use wireless microphones, who presently use the spectrum interleaved with analogue broadcasting.
- 1.54 Our approach is consistent with our strategy towards the spectrum since 2003, and with government policy. It does, however, also affect public policy.
- 1.55 This approach suggests that we do not favour using preferred access to the spectrum as part of a public policy for securing benefits for society – but it does not suggest that those social benefits do not exist. It is vital that those benefits can be secured in a world where the spectrum is a flexible, market-based resource.
- 1.56 But to make sure this happens, the financial and institutional framework for providing public services will need to recognise that the way the spectrum is managed has changed. There are, for example, many public-sector organisations that use the spectrum to provide their services, from the Ministry of Defence to public-service broadcasters. The funding and management of these organisations needs to recognise the potential need to gain access to the spectrum, if this is the best use of the resources available to them. The same may be true in other sectors – like voluntary organisations.
- 1.57 The need for this change was one of the main themes in the Government's response to the Independent Audit of Spectrum Holdings published in March 2006. This approved extending a market-based approach to managing the spectrum across the entire public sector outside broadcasting – including uses such as defence and emergency services.
- 1.58 A major programme of work is now under way to put into practice the findings of this audit. Our view is that the principles recommended by the audit should be extended to cover all possible uses of the digital dividend, including national and local television.
- 1.59 We are fully committed to understanding the value that using the digital dividend spectrum could bring to society, in all its forms.

### **Individual uses**

- 1.60 We have looked in detail at how to apply our strategy in the context of each of the many potential uses of the spectrum we can identify now.
- 1.61 Some proposals that affect individual uses are as follows.

- **Wireless microphones for community use, and similar low-power devices**

Because there are many thousands of small, independent users in this category, we plan to make channel 69 available for wireless microphones

and similar low-power devices such as in-ear monitors. We also plan to make access to the spectrum free without the need for a licence.

- **Wireless microphones for professional use, and similar low-power devices**

We recognise the risk of disrupting the many professional users of wireless microphones, and similar low-power devices such as in-ear monitors and talkback. This equipment is widely used in theatres, broadcasting and special events, so we will gradually introduce the changes to managing the spectrum here. The cleared spectrum will no longer be available as the switchover happens region by region across the country. Many users will have to retune their equipment or buy new equipment to use the different frequencies. However, we will make sure that the spectrum continues to be available for this type of use from the new capacity that will exist interleaved with the six digital terrestrial multiplexes after the switchover. We will make sure this will still be available until at least 2012. We set out in this document different options for how this capacity could be packaged and released into the market, including by auction. We will work closely with users to develop these proposals and manage the move to the new arrangements.

- **Potential low-power uses**

We are keen to investigate other new uses of the spectrum, but so far we have not received many specific proposals. We are trying to collect more evidence through this consultation, so we can make a more informed judgement next year on whether we should set aside more of the spectrum for possible low-power uses. We are also reviewing how more people can use the spectrum without a licence.

- **Local television**

Local television is a possible use of the interleaved spectrum, but we think that making this spectrum available throughout the country could make it difficult for local TV stations. So, we plan to offer packages in the interleaved spectrum that are suitable for local TV. There could be 40 or more packages available, perhaps up to 100. We will not limit this spectrum to just local TV, as there are other possible uses for this spectrum, and we plan to award the packages by auction.

- **Broadcasting and other uses**

We will package the cleared spectrum so that it is suitable for national DTT to use, for a variety of services including high definition. However, other uses and users will also be able to use the spectrum – for things such as mobile television, wireless broadband, mobile voice and data, and new possible uses.

## Timing

- 1.62 We plan to release all, or almost all, of the available UHF spectrum as soon as practical, so that society can benefit from the spectrum as early as possible.

- 1.63 At the moment, the earliest date that an auction of the available parts of the spectrum could take place would be during the second half of 2008. This would allow new services to operate in particular regions of the country as the analogue signal is switched off – without having to wait until DSO is finished in 2012.
- 1.64 We plan to include channel 36 with the rest of the spectrum, unless this would significantly delay the timing set out above. There are two reasons for this.
- Before channel 36 can be used for anything else, the existing user (airport radar) must stop using the spectrum and international negotiations must be carried out on the future use of the channel. As a result, it is not likely that the spectrum will be free for new uses before late 2008.
  - Given that channel 36 is a strong substitute for the other nationally available UHF spectrum (the cleared spectrum), it is likely to be more efficient to award all of this spectrum in one go.
- 1.65 We are also inviting views on the case for holding back a small amount of the spectrum – cleared or interleaved – as an ‘**innovation reserve**’. This would be against the possibility of major technological developments – such as new low-power uses – that could find it difficult to use the rest of the spectrum, even if it has been licensed on a flexible basis.

### **Spectrum requirements and packaging**

- 1.66 We plan to award all of the spectrum in UK-wide packages, except for packages in the interleaved spectrum that would be suitable for local television.
- 1.67 There is a large number of possible options for packaging the cleared spectrum. We have set out six options which cover the full range of possibilities, as follows.
- a – a single lot of all the cleared spectrum being considered in the DDR.
  - b – 3 lots: channels 31 to 37, 39 and 40, and 63 to 68.
  - c – 4 lots: channels 31 to 34, 35 to 37, 39 and 40, and 63 to 68.
  - d – 4 lots: channels 31 to 33, 63 to 65, 34 to 37, 39 and 40, and 66 to 68.
  - e – 5 lots: channels 31 to 33, 34 to 37, 39 and 40, 63 to 65, and 66 to 68.
  - f – 15 x 8 megahertz lots, of channels 31, 32, 33, 34, 35, 36, 37, 39, 40, 63, 64, 65, 66, 67 and 68.
- 1.68 We think that options c, d, e and f are likely to be preferable, but we want to hear the views of our stakeholders on all the options. We will present more detailed packaging proposals in a consultation in or around July 2007.
- 1.69 In the interleaved spectrum, we plan to offer:
- 40 or more packages suitable for local television; and

- UK-wide packages of interleaved spectrum suitable for wireless microphones. We will make sure the spectrum for PMSE (programme making and special-events services, mainly wireless microphones) is available at least until the end of 2012.

## Potential auction designs

1.70 There are a number of different auction formats available, which may be suitable for awarding lots of spectrum frequencies. In choosing the appropriate format for an auction, it is helpful to consider four main choices in design.

- Simultaneous or sequential sale of lots (that is, whether lots are sold all at the same time, or one after the other)
- Single round (sealed bid) or multiple rounds (ascending bids, where the amount bid in each round rises until someone wins the auction)
- General or specific lots
- An individual lot or package bidding

1.71 Our current view is that using a simultaneous, multiple-round process is likely to be the most appropriate approach for the cleared spectrum. We will think about the options for the interleaved spectrum where a simpler system may be better.

1.72 We also believe that it is likely to be more appropriate to use specific lots rather than general lots.

1.73 However, we have not yet decided whether it would be appropriate to use package bidding in this award.

1.74 We have described a number of possible auction formats, along with the advantages and disadvantages of each one. We have not yet decided the appropriate auction design for this award, and will issue more detailed plans for consultation in or around July 2007. The possible auction formats currently being considered are:

- a 'standard' simultaneous multiple-round ascending auction (SMRA) with defined lots;
- a SMRA with defined lots and package bidding;
- a clock or sealed bid with each lot as a unique category; or
- a clock or sealed bid with a more limited number of categories of general lots.

## Rights and responsibilities for use

1.75 The main non-technical conditions that we are currently considering including in the licences we issue for people to use the UHF spectrum are as follows.

- Licence term – at least 18 years, with an indefinite term after that. The licence can be withdrawn by giving five years' notice. There may be extra fees after the minimum term.
  - Tradability – the licences are allowed to be traded.
  - Liberalisation – the licences must contain the minimum necessary technical conditions and will not say what the spectrum should be used for.
  - Responsibilities relating to PMSE – the responsibility to make some interleaved capacity available for PMSE services.
- 1.76 We will also be considering how this spectrum award should take into account the 2012 London Olympics and Paralympics.

### **Citizens and consumers**

- 1.77 We believe that the proposals set out in this document will benefit citizens and consumers. We do not want to restrict potential uses and users, as there can be very large hidden costs. Instead, we want to create as much flexibility as possible for the spectrum to be used in the most efficient way.
- 1.78 Under this approach, a significant amount of the valuable digital dividend spectrum will be made available for new services which should benefit consumers and citizens, with a greater potential for new ideas, greater flexibility to achieve the best uses of the spectrum, and the potential to increase competition in communications markets.

### **Next steps**

- 1.79 This consultation, published on 19 December 2006, lasts for 13 weeks. The closing date for responses is 20 March 2007.
- 1.80 We warmly welcome comments on these proposals. We recognise how important the issues are, and we will involve stakeholders during January and February 2007, to allow stakeholders to give their views on the proposals we have put forward.
- 1.81 Alongside this document, we are also publishing a number of supporting documents, including annexes to this consultation document, a report by our consultants, the results of our consumer market research, and a number of reports covering technical and compatibility issues. These are available on our website at [www.ofcom.org.uk/consult/condocs/ddr](http://www.ofcom.org.uk/consult/condocs/ddr)
- 1.82 We expect to release a statement on this consultation in or around July 2007. At about the same time, we also expect to publish a further consultation on some of the many detailed issues that we will need to consider – such as detailed proposals on spectrum packaging and auction design.
- 1.83 A timetable for the whole spectrum award is set out in section 12. A number of factors beyond our control (for example, international developments) will affect this timetable so we may have to amend it. In particular, it is possible that in the future there may be action at European level on the digital

dividend, including the possibility of decisions by European institutions that could affect the UK.

## Section 2

# Consultation question

Question 1: This executive summary sets out our proposals for releasing the digital dividend. Do you agree with these proposals?

## Annex 1

# Responding to this consultation

### How to respond

- A1.1 Please send us your written comments on the issues raised in this document by 5pm on 20 March 2007.
- A1.2 We would prefer to receive your comments on the on-line web form at [www.ofcom.org.uk/consult/condocs/ddr/howtorespond/](http://www.ofcom.org.uk/consult/condocs/ddr/howtorespond/), as this helps us to process the responses quickly and efficiently. We would also be grateful if you could tell us whether or not there are confidentiality issues. This response cover sheet is included in the on-line web form questionnaire.
- A1.3 For larger responses to the consultation – particularly those with supporting charts, tables or other information – please e-mail Paula.guest@ofcom.org.uk, attaching your response in Microsoft Word format, together with a consultation response cover sheet.
- A1.4 Or, you can send your comments to the address below, marked with the title of the consultation.
- Paula Guest  
Ofcom  
Riverside House  
2A Southwark Bridge Road  
London  
SE1 9HA
- A1.5 We do not need a hard copy as well as an electronic version of your comments. We will acknowledge we have received your comments if you send them to us using the on-line web form, but not otherwise.
- A1.6 It would be helpful if your response could include direct answers to the questions we ask in this document, which are listed together at annex 4. It would also help if you can explain your views.

### More information

- A1.7 If you want to discuss the issues and questions raised in this consultation, or need advice on the appropriate form of response, please contact Paula Guest on 020 7981 3805.

### Confidentiality

- A1.8 We believe it is important for everyone interested in an issue to see the views of other people. We will usually publish all responses on our website, at [www.ofcom.org.uk](http://www.ofcom.org.uk) (when the people who made the comments agree to us doing this).

- A1.9 We will treat all comments as non-confidential, unless you say that part or all of the response is confidential. Please put any confidential parts of a response in a separate annex so that we can publish non-confidential parts along with your name.
- A1.10 We have the right to release any information we receive if the law says that we must do so.
- A1.11 We will assume that we can use the copyright and all other intellectual property in the responses we receive, to meet our legal responsibilities. There is more information on our approach to intellectual property rights on our website at [www.ofcom.org.uk/about/accoun/disclaimer/](http://www.ofcom.org.uk/about/accoun/disclaimer/)

### Next steps

- A1.12 Following the end of the consultation period, we will publish a statement by the end of July 2007.
- A1.13 You can register to receive free mail updates telling you about our relevant documents. For more details, please see:  
[www.ofcom.org.uk/static/subscribe/select\\_list.htm](http://www.ofcom.org.uk/static/subscribe/select_list.htm)

### Our consultation processes

- A1.14 We want to make sure that it is as easy as possible to respond to a consultation. For more information, please see our consultation principles in annex 2.
- A1.15 If you have any comments or suggestions on how we carry out our consultation, please call our consultation helpdesk on 020 7981 3003 or e-mail us at [consult@ofcom.org.uk](mailto:consult@ofcom.org.uk). We would particularly welcome your thoughts on how we could collect the views of those groups or individuals, such as small businesses or particular types of residential consumers, who are less likely to give their opinions through a formal consultation.
- A1.16 If you would like to discuss these issues or our consultation processes, you can contact Vicki Nash, Director Scotland.

Vicki Nash  
Ofcom  
Sutherland House  
149 St Vincent Street  
Glasgow  
G2 5NW

Phone: 0141 229 7401  
Fax: 0141 229 7433

E-mail: [vicki.nash@ofcom.org.uk](mailto:vicki.nash@ofcom.org.uk)

## Annex 2

# Our consultation principles

A2.1 We have published the following seven principles that we will follow for each public written consultation.

### Before the consultation

A2.2 Where possible, we will hold informal talks with people and organisations before announcing a big consultation to find out whether we are thinking in the right direction. If we do not have enough time to do this, we will hold an open meeting to explain our plans shortly after announcing the consultation.

### During the consultation

A2.3 We will be clear about who we are consulting, why, on what questions and for how long.

A2.4 We will make the consultation document as short and simple as possible, with a summary of no more than two pages. We will try to make it as easy as possible to give us a written response. If the consultation is complicated, we may provide a shortened version for smaller organisations or individuals who would otherwise not be able to spare the time to share their views.

A2.5 We will normally allow 10 weeks for responses to consultations on issues of general interest.

A2.6 There will be a person within Ofcom who will be in charge of making sure we follow our own guidelines and reach out to the largest number of people and organisations interested in the outcome of our decisions. This individual (who we call the consultation champion) will also be the main person to contact with views on the way we run our consultations.

A2.7 If we are not able to follow one of these principles, we will explain why. This may be because a particular issue is urgent. If we need to reduce the amount of time we have set aside for a consultation, we will let the people concerned know beforehand that this consultation needs their urgent attention.

### After the consultation

A2.8 We will look at each response carefully and with an open mind. We will give reasons for our decisions and explain how the views of the people concerned helped influence those decisions.