Securing long term benefits from scarce spectrum resources: A strategy for UHF bands IV and V

Response by Vodafone to the Ofcom consultation

8 June 2012

1 Introduction

Vodafone welcomes the opportunity to comment on this Ofcom consultation on the long term future of the UHF spectrum in Bands IV and V (470-790MHz). This spectrum falls in the "sweet spot" in the radio spectrum that is suitable for both capacity and coverage. It is therefore attractive for a wide range of applications, and therefore has the potential to provide substantial benefits to citizens and consumers, and to the UK economy.

If television was a new application in the twenty first century, it would be impossible to justify devoting several hundred megahertz of prime UHF spectrum to TV broadcasting, when there are several other platforms for its delivery – satellite (itself using nearly 1GHz of microwave spectrum), cable and IPTV over broadband. In this sense, UHF TV broadcasting is a legacy user of spectrum.

Around 40% of households currently use terrestrial broadcasting as their primary platform for television viewing, and a significantly higher proportion use it as secondary platform ("second sets" etc). However, these numbers will reduce over the next decade due to market trends in the broadcast industry:

- demand for multi-channel HDTV and 3DTV, which is better served by satellite and cable.
- growth in video-on-demand, which can only be delivered by cable and IPTV.
- development of technologies for wireless in-home multi-media communications, which will make it easier for consumers to connect "second sets" to cable and satellite platforms.

Despite this, many citizens and consumers will still be using terrestrial television in a decade from now for some purposes, and Ofcom will need to ensure that any future rebalancing of UHF spectrum does not significantly impair their ability to watch popular programme content on the DTT platform.

Vodafone welcomes the progress that Ofcom has made since the April '11 discussion document – for example the proposal to encourage TV installers to use wideband antennas. However, this consultation is also a missed opportunity. In February 2012, there have two important international developments (the RSPP and WRC-12) that will shape future developments in the UHF bands IV and V; it is a pity that they are not addressed in the consultation questions. We also believe that these developments remove any remaining justification for Ofcom proceeding with the 600MHz auction; this consultation could have asked this question directly instead of a number of indirect questions about this frequency range.

Vodafone expects that the developments of the RSPP and WRC-12 will lead to a second harmonised digital dividend in Europe, implemented by around 2018 – 2020. The key question for Ofcom is how it will be able to implement this in UK, and in particular how to resolve the problems resulting from TV reception antenna 'groups'.

2 Recent developments in future use of the UHF spectrum

Last February, two important decisions were taken internationally which will shape the future development of UHF Bands IV and V:

- The Radio Spectrum Policy Programme (RSPP) was approved by the European Parliament and Council.
- The ITU World Radiocommunication Conference (WRC-12) adopted a Resolution that will result in the 694-790MHz band being allocated to the mobile service from the end of 2015.

(the key provisions from these measures are attached at the end of this response)

The RSPP establishes the policy objective to identify at least 1 200 MHz of suitable spectrum by 2015. It recognises that bands around 800MHz are optimal for the coverage of large areas by wireless broadband services, and in the longer term, additional spectrum could also be envisaged in the light of the results of an analysis of technology trends, future needs and demand for spectrum. The amendments proposed by the European Parliament explicitly mentioned the 694 – 790MHz band in this context.

The WRC-12 Resolution allocates the 694-790MHz band to the mobile service and identifies it for IMT in Region 1 (i.e. Europe and Africa), effective immediately after WRC-15 - which will take place at the end of 2015. WRC-15 may refine the lower edge, and a bandplan for thos frequency range will be developed by 2015.

While the consultation document mentions these decisions in passing, it is disappointing that the consultation questions only address obliquely the issues that they raise. In this response, we first address (in section 3) the key questions relating to UHF Bands IV and V that Ofcom needs to address in response to the RSPP and WRC-12. We then (in section 4) respond to the specific questions asked in the consultation document.

3 Responses to specific questions

3.1 Future mobile broadband spectrum requirements

1: Do you agree that meeting the future growth in demand for mobile broadband capacity will deliver significant benefits to citizens and consumers?

Yes.

It is generally accepted that demand for mobile broadband will continue to grow for many years, and there are many studies that demonstrate this.

Meeting the demands of citizens and consumers will obviously deliver benefits to them and, in the case of mobile broadband, these benefits are very significant.

This has been recognised by the European Commission, Parliament and Council in the Radio Spectrum Policy Programme (RSPP).

2: Do you agree that additional harmonised mobile broadband spectrum will play an important role in meeting the future growth in demand for mobile broadband capacity? What are your views on the overall quantity of harmonised spectrum that will be required to meet future demand? How does this compare with the expected increase in spectrum for mobile use discussed in this section?

<u>The need for additional spectrum</u>

It is generally accepted that additional spectrum will be needed to meet the growing demands by citizens and consumers for mobile broadband. This is no longer a matter for debate,

because the first RSPP commits EU Member States to identifying at least 1200 MHz of spectrum suitable for mobile broadband (wireless data traffic) by 2015.

The need for harmonisation

The demand by consumers by consumers for mobile broadband can only satisfied if the spectrum to deliver it is supported by the devices that the consumers wish to use. The market for smartphones and pads is increasingly global, and a frequency band will not be included unless there is a substantial global market[1]. For UK, this means that a frequency bands needs to be harmonised at least throughout EU (and actually available in the majority of Member States), and preferably more widely.

It is not only the frequency band that needs to be harmonised; the frequency arrangement and other technical requirements need to be the same, or at least compatible enough for a common implementation in devices.

Overall quantity of Harmonised spectrum

Vodafone supports the target of the first RSPP of identifying 1200MHz of suitable spectrum by 2015. We anticipate that the second RSPP, covering the period 2015 – 2020, will implement and develop this by:

- mandating that the spectrum that has been identified in the first RSPP is made available in all Member States
- calling for the identification of further spectrum, based on the growth in demand for mobile broadband that has already occurred by that time.

This is broadly in line with the total quantity of mobile spectrum potentially available in the UK[2], including the 700MHz band, as discussed in section 3 of the consultation document. It should be noted that the discussion in the consultation document and supporting studies is for UK, and not all of this spectrum might be available for harmonised use across Europe.

3: Do you agree that additional harmonised spectrum provided by the 700 MHz band could play an important role in meeting the future growth in mobile broadband capacity?

Yes.

Mobile operators use their portfolios of spectrum in different frequency bands to deliver a number of services to customers, and they use each band in a way that makes the optimal contribution to achieving this. The bands below 1GHz[3] are used for providing coverage, both extended coverage in rural areas and reliable coverage in urban areas.

The only potential spectrum for mobile broadband below 1GHz (or just above 1GHz) lies within the 470-790MHz band. The optimum location for mobile spectrum within this frequency range is at the upper end, adjacent to the 800MHz mobile band. This would minimise the complexity of implementing the band in devices and provide the best coexistence between mobile services and DTT.

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[1] There is a technology limit to the number of frequency bands that can be supported by a device, and each band added has a marginal cost of around 1-2 Euros (depending on the combination of bands supported by the device) and a marginal impact on performance.

[2] Figure 8 in the consultation document should be regarded as illustrative only. Some of the assumptions underlying the diagram are open to question, particularly relating to timing. However, these assumptions do not significantly affect the overall conclusions, and it is not productive to speculate on the timelines for bands above 1GHz in the context of a consultation addressing spectrum below 1GHz.

[3] This phrase is industry shorthand to distinguish the characteristics existing mobile bands in the 700 – 960MHz range from those above 1710MHz (there is not a discontinuity at 1GHz).

4: Do you agree that the value of the role played by the 700 MHz band in meeting the future growth in mobile broadband capacity would be greater if it becomes available before other capacity enhancing techniques have been exhausted at existing mobile sites?

Yes.

The bands below 1GHz are used for providing coverage, both extended coverage in rural areas and reliable coverage in urban areas. Cell splitting reduces these benefits of lower frequencies. To the operator, it increases the cost of network deployment, and to the consumer it increases the number of base stations and can increase the risk of 'not-spots'.

It is therefore highly desirable for the 700MHz band to be made available before cell splitting becomes necessary.

5: What timing of 700MHz release would maximise the benefits associated with its use for mobile broadband?

The study by Real Wireless gives a graphic illustration of a spectrum crunch if more spectrum is not made available in due time. However, the analysis is based on a large number of assumptions and predictions and, as Real Wireless says, should be regarded as illustrative. The Real Wireless study is technical, and does not appear to have taken account of some practical limitations, such as the ability to finding sites or obtain planning permission for more or larger antennas.

The Real Wireless analysis is based on average assumptions across substantial parts of a network, whereas consumer demands and network deployment constraints are localised. This means that additional spectrum is likely to be needed at an earlier date than predicted by Real Wireless, in order to meet rising consumer expectations for ubiquitous services and regulatory coverage targets/obligations.

3.2 Future DTT spectrum requirements

The questions in this section are rather skewed by the focus on a continuing role particular time period of a decade. The multimedia market is changing rapidly, and it is clear that the role DTT will play in that market in ten years will be different to its role today. However, it will probably still be in a period of transition, and it would be more effective for Ofcom to consider the end points instead of the status over an arbitrary period.

Ofcom is a significant actor in this evolution, and it can influence the development of digital broadcasting platforms in order to achieve broader public policy objectives. The typical replacement cycle for digital receiving equipment is around 5-7 years and falling[4], so if this occurs over a decade or more this would not significantly impact consumers.

6: Do you agree that DTT will continue to play an important role in providing universal low cost access to PSB content over at least the next decade?

No.

The current cost of a TV licence is £145.50 per year, so the minimum cost of real-time access to PSB content over the next decade is at least £1455, which is far greater than the cost of reception equipment and installation for any of the platforms. Therefore, the cost of a platform swap will not be a barrier to maintaining low cost access to PSB content, if it is managed effectively over a number of years.

[4] Technical Evolution of the DTT Platform; Zetacast; January 2012; page 26-27.

Already, more than 70% of UK households subscribe to broadband, and this likely to become almost universal over the next decade. Therefore, non-real-time IPTV (e.g. I-Player) may well take over the role of providing universal low cost access to PSB content, because this does not require a TV licence.

Ofcom should investigate ways of encouraging consumers to migrate away from using the DTT platform, as they replace and upgrade their TV reception equipment.

A key enabler for this is for consumers to be able to readily connect their second sets to a "set top box" in a different part of their home – which will need to use wireless. Ofcom should therefore encourage the development of wireless technologies for in-home multimedia communications (though, obviously, not ones that use TV white spaces), and ensure that sufficient suitable spectrum is available for them to use.

7: Do you agree that, absent major changes in available spectrum, DTT would continue to remain attractive to viewers and deliver important benefits to citizens and consumers over at least the next decade?

No.

Citizens and consumers are not concerned by the spectrum available to the DTT platform, but rather the programme content that it carries. Over time, the technical advances in the DTT platform will enable this programme content to be carried using less spectrum, in the formats that will provide important benefits to users of the DTT platform. The benefits that can be provided uniquely or in the most effective way by the DTT platform will also diminish over time. These points are developed in the following questions.

8: What are your views on the future technical evolution of the DTT platform? Are there other relevant factors affecting future DTT spectrum requirements that we should consider as we develop an approach to secure benefits from UHF band IV and V over the long term?

The consultation overlooks the market segmentation that is already taking place between the usage patterns for DTT and other TV platforms. The take-up of HDTV and 3D-TV is largely driven by sports and film content; increasingly, premium sports and newly released films are only available on subscription channels, and these channels are not available on the Freeview DTT platform. Video-on-demand is only available on IPTV and cable platforms. Therefore, customers seeking film, sports and other premium content will increasingly migrate away from DTT to other platforms, and the DTT platform will increasingly be used only by customers who want only a limited number of real-time channels, or for second sets.

The Zetacast study only considers the technical evolution of the DTT platform, and not the market evolution. It therefore assumes that the DTT platform needs to replicate (as far as possible) the programme content and picture resolutions of the other platforms (this is an underlying assumptions for all of the scenarios in section 8 of the report). As a result, the number of multiplexes that will be needed to provide the services that customers of the DTT platform will want would be less than predicted.

9: Do you agree that a longer term approach to secure benefits from UHF band IV and V should consider how to safeguard benefits delivered by the DTT platform?

No.

The principle objective of Ofcom is to further the interests of citizens and consumers in relation to communications related matters and relevant markets[5]. To achieve this objective, Ofcom

[5] Communications Act 2003, Section 3.

will need to safeguard the benefits that are delivered by the DTT platform (as long as citizens and consumers continue to want them), but Ofcom should not regard it as an objective *per se* to safeguard the DTT platform or the UHF spectrum that it uses.

Ofcom is also required to secure the optimal use for wireless telegraphy of the electro-magnetic spectrum. The reservation of several hundred MHz of valuable UHF spectrum for DTT is not an optimal use of radio spectrum, especially when other platforms are available that use different frequency bands (satellite) or do not use the electromagnetic spectrum at all (cable and IPTV).

In the short and medium term, the DTT platform will clearly need to be maintained in some form in order to safeguard the interests of current users of the platform. However, in the longer term (i.e. longer than the typical replacement cycle for TV reception equipment), Ofcom could consider strategies to migrate users on to other platforms.

3.3 Other uses of UHF bands IV and V

10: Are there other material factors affecting the future requirements of PMSE that we should consider as we develop an approach to secure long term benefits from UHF band IV and V?

PMSE (radio microphones) has been a major user of 'white spaces' within the UHF band for many years. PMSE is an important element of many parts of the entertainment industry, which forms a significant part of the UK economy. However, there appears to be some form of market failure that makes it impossible for this industry to pay a very small part of its turnover for the spectrum that it uses. When the full UHF band was used for TV broadcasting and there was no other application for the "white spaces" the opportunity cost of using this spectrum for PMSE was very low. However, the opportunity cost is now considerable.

It is likely that any future changes in use of bands IV and V will reduce the availability of white space spectrum for PMSE. Learning from the experience of Channel 69, it is important that future bands for use by PMSE are identified well ahead of the possible loss of capacity in bands IV and V, so that the PMSE industry can migrate to the new band over the natural replacement cycle for PMSE equipment. Ofcom might consider encouraging this migration through discounted pricing for PMSE licences.

One possible future band for radio microphones is 2010 – 2090MHz. This band is already used by another type of PMSE –electronic news gathering (ENG) and outside broadcast links – and the sharing criteria with other primary services in the same band will make it difficult to use for high capacity mobile applications for many years. This might partially displace the existing ENG use of this band; however, research is already well underway on improving the spectrum efficiency of ENG links (using techniques like MIMO) and using higher frequency bands.

11: Are there other material factors affecting the future requirements of Local TV that we should consider as we develop an approach to secure long term benefits from UHF band IV and V?

There seems to be very little demand for local TV, either from consumers or content providers. It is therefore doubtful that there will be any significant benefits that need to be secured.

12: Are there other material factors affecting the future requirements of WSD applications that we should consider as we develop an approach to secure long term benefits from UHF band IV and V?

Yes.

Figures provided in previous Ofcom consultations demonstrate that the economic value of UHF Band IV and V spectrum is around a hundred times higher if used for licenced applications than if it is used for white space devices; this is shown in the Vodafone response to the February 2009 Ofcom consultation on cognitive access[6].

The UHF bands IV and V are particularly valuable because they have good propagation characteristics for providing coverage. Ofcom needs to ensure that the long term potential of this spectrum is not compromised by WSD applications that do not benefit from these characteristics – in particular, home multi-media applications.

13: Aside from WSDs, are there other innovative ways in which to use UHF bands IV and V to deliver services and, therefore, material benefits to users?

Ofcom is required to have regard to all aspects of innovation in relevant markets, and not just those aspects related to delivery of services. Mobile networks provide a platform for the development and delivery of a wealth of innovative applications and services that provide substantial benefits to users, as well as the innovation in the technology and deployment of the network itself.

14: Are there other material factors affecting the future requirements of emergency services applications that we should be aware of as we develop an approach to secure long term benefits from UHF band IV and V?

No comment.

3.4 Securing long term benefits for citizens and consumers

15: Do you agree that the approach that is most likely to secure significant benefits from UHF band IV and V over the long term is one that enables the release of the 700 MHz band for mobile broadband whilst also ensuring the role of the DTT platform is safeguarded?

Yes.

It is likely that any future changes in the use of UHF bands IV and V will be driven at an EU level, just as was the case for the 800MHz band. As a consequence, the benefits to citizens and consumers from release of the 700MHz band for mobile broadband will also be assessed at a European level. In the majority of EU countries, the DTT platform is used less extensively than in UK, and this use is diminishing. Also, in continental Europe, almost all TV reception antennas are wideband. It is therefore likely that the optimal timescale for Harmonised European release of 700MHz band will be earlier than for the UK alone. The technical development of the Geneva 06 plan took two years so, if the planning work started soon after WRC-15, the release of the 700MHz band could start in Europe from around 2018.

If the release of the 700MHz band takes place in this timeframe, then there is likely to be a transitional period during which DTT would need some alternative spectrum, to meet public policy and consumer needs.

See Q9 for further discussion on the future role of the DTT platform.

16: Do you believe there is a material risk that the DTT platform will have insufficient spectrum to continue to deliver important benefits (including providing universal low cost access to PSB content) if the 600MHz band is not used for DTT when the after clearance of the 700 MHz band?

[6] Vodafone response to Ofcom consultation on the Digital Dividend: cognitive access - licence-exempting cognitive devices using interleaved spectrum (February 2009); comments on impact assessment, last paragraph of P8 and first paragraph of p9.

Yes.

As discussed elsewhere in this response, there is a significant likelihood that Ofcom will be required to clear the 700MHz band by the end of this decade in order to comply with an EU Harmonisation measure. In that timeframe, it is likely that the 600MHz band will still be required, in order to maintain the programme content that DTT viewers will want at that time.

As discussed in question 6, it is incorrect to assume that DTT is necessary to maintain low cost access to PSB in the long term. Compared to the licence fee, the cost of reception equipment for any of the free-to-air platforms is insignificant.

17: Do you believe that using the 600 MHz band for DTT after clearing the 700 MHz band would reduce the risk that the DTT platform will not be able to continue to provide important citizen and consumer benefits?

Yes – to the extent that the DTT platform continues to provide benefits to citizens and consumers that are not provided by other platforms.

The only plausible long-term uses for the 600MHz band are for DTT or for applications of the mobile service. If Ofcom concludes that more bandwidth should be allocated for mobile services than the 694 – 790MHz band that is considered in this consultation, then it would be more sensible to move the 694MHz boundary downwards than to introduce a second mobile band at around 600MHz. This possibility is already addressed in the agenda for WRC-15, and could be implemented at a European level, whereas a 600MHz band would remain unique to UK.

18: Do you agree that the future benefits for citizens and consumers of enabling the release of the 700 MHz band whilst maintaining the role of DTT are likely to outweigh the loss in benefits of the 600 MHz band not being able to be used for other services in the long term?

Definitely.

The 600MHz band is sufficient to maintain the current number of multiplexes, if the 694-790MHz band is released for mobile. This will enable an increase in either the number of programme channels of their picture resolution, which was not envisaged when the digital switchover was originally planned.

The whole justification for white space applications is that they share with primary users of the spectrum; it is an oxymoron to reserve spectrum such as the 600MHz band exclusively for white space devices. Data provided in previous Ofcom consultations demonstrates that the benefits of releasing spectrum for mobile networks is far greater than using it for white space devices – see question 12.

19: Have we identified correctly the possible short-term uses of the 600 MHz spectrum? Are there other short-term uses we should consider?

It is likely that the outcome of WRC-15 and the studies carried out under the first RSPP will lead to EU harmonisation measures for a second digital dividend within the period of the second RSPP (i.e. by 2020). In some EU countries, DTT is hardly used, and is likely to have ceased by 2020. This will free up allotments, which will ease the task of replanning the DTT allotments that are actually used into less bandwidth (including increasing the use of SFNs). Vodafone recommends that Ofcom plans on the basis that a second digital dividend could well be mandated in EU by 2020.

The implementation of a second digital dividend will need some existing TV reception antennas to be replaced. To minimise inconvenience to viewers, this is likely to require an extended period of simulcasting on old and new channels where a retuning results in a change of antenna group. The 600MHz band would therefore be needed for broadcasting some time before 700MHz band clearance begins, say in 2018.

Any application that creates significant value from use of spectrum requires investment, and therefore requires time to recoup that investment. Consumers are likely to find significant value in a service that will disappear within a few years. There is always a risk that a holder of a short-term licence will acquire incumbency rights (or take legal action in the attempt to acquire them, which would delay a licence award for the spectrum).

Ofcom has many important tasks on its plate, and it should not spend time trying to maximise value from new short term uses of the 600MHz band, when there is very little value to be realised.

20: Which option(s) for releasing 600 MHz in the short term would maximise its value whilst supporting our proposed longer term objectives?

There are three possible uses of this spectrum that Ofcom can authorise without much effort or a complex licence award process:

- PMSE, as part of a transition plan to a different frequency band (see question 10).
- Licence-exempt white space devices (though Ofcom must take care that this does not give rise to incumbency)
- An innovation reserve (though this cannot be for commercial services); this can be managed under the existing regime for test and development licences.

These applications are short-term and are not tied to a particular part of UHF bands IV and V.

3.5 The wider impacts of changing the use of the 700MHz band

21: Do you agree that the wider impacts of a future change of use of the 700MHz band could be managed to prevent them having a detrimental impact on consumers and the services operating in this band?

Yes.

Vodafone agrees that the future change of use of the 700MHz band can be achieved without having a detrimental impact on citizens or consumers. However, Ofcom needs to factor this into its spectrum planning from now on, to ensure that purchasing decisions made in the shorter term do not give rise to unnecessary impact when the change of use occurs.

Ofcom has recognised of the importance of wideband TV reception antennas for the long-term effective use of UHF bands IV and V. However, the replacement timescale for existing antennas is very long, and it is likely that there will still be many narrowband antennas at the time. Ass suggested in question 19, an extended period of simulcasting of an affected multiplex on the old and new channel (together with on-screen messages) will enable DTT customers to identify if they need to replace a rooftop antenna, and make the necessary arrangements.

3.6 Proposed approach for securing future benefits and next steps

22: Do you agree that the approach set out in this consultation is likely to secure significant benefits for citizens and consumers over the long term?

Yes.

Vodafone agrees with Ofcom that the release of the 700MHz band for mobile applications will provide substantial benefits for citizens and consumers. This benefit will be found throughout Europe, which will probably lead to harmonised EU measures to designate and make this spectrum available for mobile services. This benefit will greatly exceed any inconvenience to DTT viewers from migration of channels to the 600MHz band. While an award for the 700MHz is unlikely spectrum until it has been internationally harmonised and coordinated, Ofcom

already needs to start taking the preliminary steps, to ensure that the migration of DTT to the 600MHz band can proceed as smoothly as possible.

23: Have we correctly identified the main areas of future work that could follow this consultation process subject to its outcome?

In general, yes. However:

- Ofcom should be distracted by searching for short term uses for the 600MHz band.
- Informal discussions on coordination with neighbouring countries do not need to wait until after WRC-15.
- Ofcom should work to encourage both the deployment of wideband DTT antennas and improvements in the performance of DTT receivers (this will be necessary anyway for effective deployment of WSDs).
- Ofcom should work with the PMSE community to identify a suitable replacement band for wireless microphones over the lifecycle of equipment.

4 Representations on the impact assessment

Paragraph 2.27 states that the analysis in the consultation document as a whole represents an impact assessment. The whole of this consultation response constitutes representations on the impact assessment in accordance with Section 7 (7) a) and b) of the Communications Act 2003.

5 Agenda item and resolution from WRC 12

Agenda item for WRC-15:

1.2 to examine the results of ITU-R studies, in accordance with Resolution **COM5/10 (WRC-12)**, on the use of the frequency band 694-790 MHz by the mobile, except aeronautical mobile, service in Region 1 and take the appropriate measures;

RESOLUTION COM5/10 (WRC-12)

Use of the frequency band 694-790 MHz by the mobile, except aeronautical mobile, service in Region 1 and related studies

The World Radiocommunication Conference (Geneva, 2012),

considering

a) that IMT systems are intended to provide telecommunication services on a worldwide scale, regardless of location, network or terminal used;

b) that some administrations are planning to use the band 694-862 MHz, or part of that band, for IMT;

c) that the frequency band 470-806/862 MHz is allocated to the broadcasting service on a primary basis in all three Regions and used predominantly by this service, and that the GE06 Agreement applies in all Region 1 countries, except Mongolia, and in the Islamic Republic of Iran in Region 3;

d) that the band 645-862 MHz is allocated on a primary basis to the aeronautical radionavigation service in the countries listed in No. **5.312**;

e) that cellular mobile systems in the three Regions in the bands below 1 GHz operate using various channelling arrangements;

f) that where cost considerations warrant the installation of fewer base stations, such as in rural and/or sparsely populated areas, bands below 1 GHz are generally suitable for implementing mobile systems including IMT;

g) that bands below 1 GHz are important, especially for some developing countries and countries with large areas where economic solutions for low population density areas are necessary,

noting

a) that, as a result of the transition from analogue to digital terrestrial television broadcasting, some countries are planning to make, or are making, the band 694-862 MHz, or parts of that band, available for applications in the mobile service;

b) that the transition from analogue to digital television shall end on 17 June 2015 at 0001 hours UTC according to Article 12.6 of the GE06 Agreement;

c) that the transition from analogue to digital television is expected to result in situations where parts or all of the band 470-806/862 MHz will be used extensively for both analogue and digital terrestrial transmissions, and that the demand for spectrum during the transition period may be even greater than the stand-alone usage of analogue broadcasting systems;

d) that Recommendation ITU-R M.819 describes the objectives to be met by IMT in order to meet the needs of developing countries, and in order to assist them to "bridge the gap" between their communication capabilities and those of developed countries;

e) that Recommendation ITU-R M.1645 also describes the coverage objectives of IMT;

f) that WRC-12 has approved Resolution **COM6/8 (WRC-12)** which includes studies to be carried out by ITU-R in time for WRC-15,

recognizing

a) that there is a need, in many developing countries and countries with large areas of low population density, for the cost-effective implementation of IMT, and that the propagation characteristics of frequency bands below 1 GHz identified in Nos. **5.286AA** and **5.317A** result in larger cells;

b) that some countries also plan to use the band 470-862 MHz for HDTV and other higher definition modes;

c) that in Region 1, in accordance with No. **5.296**, a number of countries have deployments of applications ancillary to broadcasting operating on a secondary basis, which provide tools for the daily content production for the broadcast service;

d) that the GE06 Agreement contains provisions for the terrestrial broadcasting service and other primary terrestrial services, a Plan for digital television, and a list of stations of other primary terrestrial services;

e) that the time-frame and transition period for the analogue to digital television switchover may not be the same for all countries;

f) that there is a need for countries to assess the consequences of a new allocation for the mobile service below 790 MHz on the equitable access to spectrum in the GE06 Plan,

resolves

1 ***to allocate the frequency band 694-790 MHz in Region 1 to the mobile, except aeronautical mobile, service on a co-primary basis with other services to which this band is allocated on a primary basis and to identify it for IMT;***

2 ***that the allocation in resolves 1 is effective immediately after WRC-15;***

3 that use of the allocation in *resolves* 1 is subject to agreement obtained under No. **9.21** with respect to the aeronautical radionavigation service in countries listed in No. **5.312**;

4 that the lower edge of the allocation is subject to refinement at WRC-15, taking into account the ITU-R studies referred to in *invites ITU-R* below and the needs of countries in Region 1, in particular developing countries;

5 that WRC-15 will specify the technical and regulatory conditions applicable to the mobile service allocation referred to in *resolves* 1, taking into account the ITU-R studies referred to in *invites ITU-R* below,

invites ITU-R

1 to study the spectrum requirement for the mobile service and for the broadcasting service in this frequency band, in order to determine as early as possible the options for the lower edge referred to in *resolves* 4;

2 to study the channelling arrangements for the mobile service, adapted to the frequency band below 790 MHz, taking into account:

– the existing arrangements in Region 1 in the bands between 790 and 862 MHz and defined in the last version of Recommendation ITU-R M.1036, in order to ensure coexistence with the networks operated in the new allocation and the operational networks in the band 790-862 MHz,

– the desire for harmonization with arrangements across all Regions,

– the compatibility with other primary services to which the band is allocated, including in adjacent bands;

3 to study coexistence between the different channelling arrangements which have been implemented in Region 1 above 790 MHz, as well as the possibility of further harmonization;

4 to study the compatibility between the mobile service and other services currently allocated in the frequency band 694-790 MHz and develop ITU-R Recommendations or Reports;

5 to study solutions for accommodating applications ancillary to broadcasting requirements;

6 to report, in time for WRC-15, the results of these studies,

invites the Director of the Radiocommunication Bureau

to work, in cooperation with the Director of the Telecommunication Development Bureau, to bring assistance to developing countries wishing to implement the new mobile allocation in order to help these administrations to determine the modifications of the Geneva-06 Plan necessary to keep sufficient capacity for broadcasting,

invites administrations

to participate in these studies and to indicate as quickly as possible, in the process of preparation for WRC-15, the spectrum requirement for the mobile service, the broadcasting service and the other services, in order to determine the options for the frequency band to be allocated to the mobile service, as well as the related channelling arrangements.

6 Extracts from the Radio Spectrum Policy Programme

Whereas:

(23) The 800 MHz band (790-862 MHz) is optimal for the coverage of large areas by wireless broadband services. Building on the harmonisation of technical conditions under Decision 2010/267/EU, and on the Commission Recommendation of 28 October 2009 facilitating the release of the digital dividend in the European Union (1) calling for analogue broadcasting to be switched off by 1 January 2012, and given rapid national regulatory developments, that band should in principle be made available for electronic communications services in the Union by 2013. In the longer term, additional spectrum could also be envisaged in the light of the results of an analysis of technology trends, future needs and demand for spectrum. Considering the capacity of the 800 MHz band to transmit over large areas, coverage obligations could be attached to rights, where appropriate

Article 2

General regulatory principles

2. For electronic communications, in addition to the general regulatory principles defined in paragraph 1 of this Article, the following specific principles shall apply, in accordance with Articles 8a, 9, 9a and 9b of Directive 2002/21/EC and with Decision No 676/2002/EC:

(b) promoting the harmonisation of use of radio frequencies across the Union, consistent with the need to ensure effective and efficient use thereof;

(c) facilitating increased wireless data traffic and broadband services, in particular by fostering flexibility, and promoting innovation, taking account of the need to avoid harmful interference and ensure the technical quality of service.

Article 3

Policy objectives

In order to focus on the priorities of this Decision, Member States and the Commission shall cooperate to support and achieve the following policy objectives:

(a) encourage efficient management and use of spectrum to best meet the increasing demand for use of frequencies reflecting the important social, cultural and economic value of spectrum;

(b) seek to allocate sufficient and appropriate spectrum in a timely manner to support Union policy objectives and to best meet the increasing demand for wireless data traffic, thereby allowing the development of commercial and public services, while taking into account important general interest objectives such as cultural diversity and media pluralism; to that end, ***every effort should be made to identify***, based on the inventory established pursuant to Article 9, ***at least 1 200 MHz of suitable spectrum by 2015***. That figure includes spectrum already in use;

(c) bridge the digital divide and contribute to the objectives of the Digital Agenda for Europe, fostering access to broadband at a speed of not less than 30 Mbps by 2020 for all Union citizens and making it possible for the Union to have the highest possible broadband speed and capacity;

(d) enable the Union to take the lead in wireless electronic communication broadband services by freeing up sufficient spectrum in cost-efficient bands for those services to be widely available;

(j) reduce the fragmentation and fully exploit the potential of the internal market in order to foster economic growth and economies of scale at the level of the Union by enhancing the coordination and harmonisation of technical conditions for the use and availability of spectrum, as appropriate;

Article 6

Spectrum needs for wireless broadband communications

1. Member States shall, in cooperation with the Commission, take all steps necessary to ensure that sufficient spectrum for coverage and capacity purposes is available within the Union, in order to enable the Union to have the fastest broadband speeds in the world, thereby making it possible for wireless applications and European leadership in new services to contribute effectively to economic growth, and to achieving the target for all citizens to have access to broadband speeds of not less than 30 Mbps by 2020.

Text proposed by the European Parliament

The following text was proposed by the European Parliament as part of an amendment[7] to the Commission proposal:

Further mobile service spectrum allocations, such as the 700 MHz band (694-790 MHz), should be evaluated depending on future capacity requirements for wireless broadband services and terrestrial TV.

[7] 2010/0252 (COD), amendment 20.