



Consultation Paper

Award of available UHF spectrum in the urban areas of Cork, Dublin, Galway, Limerick and Waterford and related licensing options.

This document consults on the award of 8MHz of UHF spectrum in each of the above five urban areas and related licensing issues.

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All responses to this consultation should be clearly marked:-
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and sent by post, facsimile, e-mail or on-line at www.comreg.ie
(current consultations), to arrive on or before 5pm, Wednesday
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Please note ComReg will publish all respondents' submissions with the Response to this Consultation, subject to the provisions of ComReg's Guidelines on the Treatment of Confidential Information – ComReg document 05/24.

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1 Foreword

The Commission for Communications Regulation (ComReg) is aware of the critical importance of managing the radio spectrum efficiently and providing access to spectrum so that consumers, industry and the economy can benefit from the convergence and digitalisation of electronic communications services and networks.

The ultra high frequency (UHF) spectrum band, 470 to 862MHz, has for many years been primarily used to provide analogue television broadcasting services. The advent of digital technology will result in more efficient use of spectrum and this will enable existing analogue services to be provided using less radio spectrum. This, in turn, will open up the possibility of the provision of additional television services or of the use of some spectrum for the provision of other services such as mobile television services.

ComReg is considering making available licence to use a single 8MHz UHF spectrum channel for award initially in the urban areas of Cork, Dublin, Galway, Limerick and Waterford.

This licence could be of interest to the broadcasting sector by facilitating the provision of a multi-city Mobile TV Service by the Mobile TV Industry, which consists of content producers, network operators, broadcasters, mobile service operators and equipment manufactures.

Alternatively this licence could be of interest to other spectrum users on a service and technology neutral basis.

By providing two possible award options ComReg is providing interested parties with a broad scope to best create future market opportunities.

ComReg is committed to employing effective and transparent procedures in formulating a licence to use this spectrum. The proposals contained in this document are intended to minimise regulatory uncertainty and to ensure that the regulatory regime employed is appropriate to the licence awarded. Whatever the final formulation of the regulatory regime and the licence to be issued, ComReg considers it appropriate that a single round sealed bid auction would be used to decide on the licensee.

I would encourage interested parties to participate in this consultation process so as to best inform the decisions made by ComReg in relation to licensing this spectrum.

**Mike Byrne,
Commissioner.**

2 Executive Summary

The purpose of this document is to consult on the award of a licence to use a single 8MHz spectrum channel in the ultra high frequency (UHF¹) spectrum band, between 470 MHz and 750 MHz, in five main urban areas. The urban areas are Cork, Dublin, Galway Limerick and Waterford.

The focus of the consultation is on two award options being considered by ComReg:

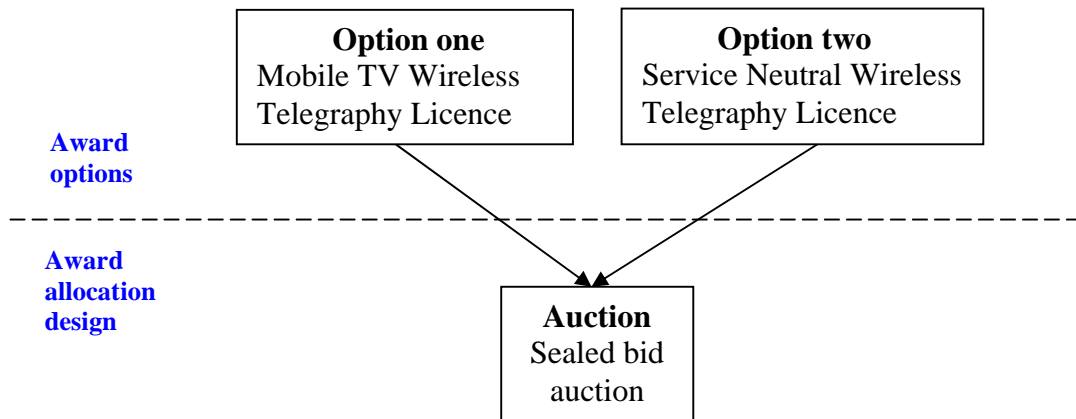


Figure 1.0 Schematic of two award options under consideration and the award allocation design

ComReg is cognisant of the need to ensure that reception by viewers of existing and future planned digital terrestrial television (DTT) services in the UHF band is protected.

The first award option is exclusively based on the award of a Wireless Telegraphy Licence for Mobile TV apparatus (“Mobile TV Wireless Telegraphy Licence”). The proposed licence conditions for the Mobile TV Wireless Telegraphy Licence are detailed in **Section 6** of this document. ComReg’s preliminary views on these licence conditions include:

- licence duration of 10 years;
- wholesale service obligations, including:
 - wholesale access to the common content carried on the multiplex²;
 - transparency of terms and conditions relating to wholesale access;
 - non-discrimination and fairness in relation to the terms and conditions for equivalent wholesale access;

¹ Please note, the Ultra High Frequency (UHF) Band extends from 470 MHz to 862 MHz. ComReg only proposes that spectrum be made available in a subset of this Band, 470 MHz to 750 MHz, at this time.

² A “multiplex” means an electronic system which combines programme material and related and other data in a digital form and the transmission of that material and data so combined by means of wireless telegraphy directly or indirectly for reception by the general public: Broadcasting (Amendment) Act 2007.

- access to capacity on fair non-discrimination terms, subject to capacity constraints on the multiplex, to enable providers of distribution services to end-users to provide one programme service of their own within the multiplex; and
- an appropriate dispute resolution mechanism in relation to these obligations;
- rollout obligations, including:
 - access for end-users to the Mobile TV Service in each of the five urban areas within 24 months of the licence award;
- sanctions for non-compliance with licence conditions, including, where appropriate:
 - licence revocation, suspension, term reduction, reduction of geographical coverage area and re-allocation of any spectrum thus recovered;
- technical conditions permitting mobile reception of multiplexes; and,
- licence fees of €340,000 per annum indexed to inflation on an annual basis using the consumer price index.

The second award option is based on the award of a Wireless Telegraphy Licence on a service neutral basis (“Service Neutral Wireless Telegraphy Licence”), provided that:

1. the service can operate within the spectrum mask specified in the Geneva Treaty 2006 (GE-06 Treaty)³;
2. the provisions of Articles 5.1.2e and 5.1.3 (envelope concept) of the GE-06 Treaty can be used; and
3. no additional interference is caused and no additional protection is required by the service.

This award option provides the broadest possible opportunity for spectrum to be used by the market. The Service Neutral Wireless Telegraphy Licence conditions are detailed in **Section 7** of this document. ComReg’s preliminary views on these licence conditions include the following:

- licence duration of 10 years;

³ GE-06 Treaty was signed by Ireland on 16 June 2006 as part of the international frequency planning conference for VHF (Band III) and UHF (Band IV & V) spectrum bands in Europe, Africa, Middle East and Islamic Republic of Iran.

- technical conditions governing the use of spectrum to be released in terms of the GE-06 Plan⁴ entries and the GE-06 spectrum mask⁵; and
- licence fees of €650,000 per annum indexed to inflation on an annual basis using the consumer price index.

In relation to both the Mobile TV Wireless Telegraphy Licence and the Service Neutral Wireless Telegraphy Licence, the proposed award allocation design would be a “single sealed bid first price auction”. ComReg also proposes that the relevant reserve price which would apply in respect of such an auction would be €100,000. In recognition of licence fees, which relate to spectrum use and which would be set down as a licence condition, ComReg has purposely chosen a low auction reserve price, which relates to an initial spectrum access charge and would offset the costs to ComReg associated with providing the necessary access.

⁴ The frequency assignments agreed at the GE-06 Treaty are contained in the GE-06 Plan of that Treaty and commonly referred to as GE-06 Plan entries.

⁵ The GE-06 spectrum mask is set down in Appendix 2 and is based on power level measurements taken in a 4kHz bandwidth.

3 Introduction

Rapid and growing interest exists in Europe and around the world in the potential availability of spectrum below 1GHz, which could be used to provide additional electronic communications networks and services, including those targeted at handheld mobile devices. Opportunities for the introduction of mobile multimedia services, such as Mobile TV, in the spectrum below 1 GHz arise due to the transition from analogue terrestrial television to digital terrestrial television (DTT) and the subsequent planned switch-off of analogue terrestrial television (ASO).⁶

Reception of terrestrial television services by means of handheld mobile devices is the latest member of the family of broadcasting applications. These services can be transmitted on mobile telephony networks, satellite networks, dedicated terrestrial networks or on hybrid networks.

The dedicated terrestrial network approach, which involves transmission using relatively high power from high sites, probably shared with other broadcast transmitter networks and some lower power fill in transmitter stations as necessary, has however particular advantages which include the economical and scalable way that content can be delivered to almost any number of recipients in the network's coverage area. The dedicated terrestrial network approach is used in many countries for example in Finland, Germany, Italy, Japan, Korea, Qatar and the USA. Other countries including Australia, Denmark, France, Ireland⁷, Spain and the United Kingdom have trialled the dedicated terrestrial network approach.

The current terrestrial technical standards for Mobile TV include:

- Media Forward Link Only (Media-FLO) - which has been deployed for Mobile TV Services in the USA;
- Terrestrial-Digital Multimedia Broadcasting (T-DMB) - which has been deployed for Mobile TV Services in Korea⁸;
- One Segment Broadcasting (OSB)⁹ - which has been deployed for Mobile TV Services in Japan; and

⁶ Digital broadcasting transmissions make more efficient use of spectrum in comparison with analogue transmissions (estimated to be between four and eight times more efficient) and therefore the existing analogue transmissions when converted to digital will use less spectrum, leaving some spectrum in this band for additional services.

⁷ A trial Mobile TV Service commenced in Dublin in 2007 under a trial licence issued by ComReg in January 2007. The trial is a partnership between O2 Communications (Ireland) Ltd (O2) and Arqiva Ltd and includes three hundred and fifty O2 customers as trial participants. A survey carried out by the licensee indicated a positive attitude towards Mobile TV in the trial area of Dublin.

⁸ A Mobile TV Service using a variant of the Digital Multimedia Broadcasting technical standard is also deployed in Germany. However, the recent award of a licence for a Mobile TV Service using the DVB-H technical standard in Germany may result in the closure of this DMB Mobile TV Service.

⁹ OSB is an extension of Integrated Services Digital Broadcasting-Terrestrial (ISDB-T).

- Digital Video Broadcast – Handheld (DVB-H)¹⁰ - which has been deployed for Mobile TV Services in Europe and is the standard favoured by European Commission for a harmonised deployment of Mobile TV Services throughout the European Member States.

Mobile TV Services are expected to be launched in Austria, Estonia, France, Germany, the Netherlands, Poland, the Russian Federation and Switzerland in 2008 using the dedicated network approach. Some of these services commenced in coincidence with the start of the Euro 2008 Association Football Championships in June 2008 using the DVB-H technical standard.

In China, the biggest terrestrial television market in the world, a Mobile TV Service is expected to be in place to coincide with the 2008 Beijing Olympics in August 2008. This Mobile TV Service is expected to use a hybrid satellite-terrestrial network approach and the Satellite Terrestrial Interactive Multi-service Infrastructure (STiMi)¹¹ technical standard.

The European Commission supports the launch of Mobile TV Services across Europe and favours the use of the DVB-H technical standard. The European Commission's comprehensive strategy for Mobile TV Services in Europe has been largely endorsed by Member States and has won the support of a large part of the Mobile TV Industry including content producers, network operators, broadcasters, mobile service operators and equipment manufacturers.

Historically the ultra high frequency (UHF) band, 470 MHz to 862 MHz, has been primarily used to provide analogue television broadcasting services. The international regulatory and technical frameworks for digital terrestrial broadcasting in the UHF band are established under the Geneva 2006 Treaty (GE-06 Treaty). The GE-06 Treaty is optimised for digital terrestrial broadcasting in the UHF band through the creation and agreement of harmonised DVB-T¹² planning and technical criteria by the Treaty signatories.

The GE- 06 Treaty also facilitates the concept of flexible spectrum use. It provides for the possibility to deploy terrestrial applications other than broadcasting in the UHF band by allowing existing and future GE-06 Plan entries to be assigned for other uses, provided that no additional interference is caused and no additional protection is required.

The European Commission, in its review of the EU regulatory framework on electronic communications networks and services, emphasises the necessity to increase flexibility, and greater use of market mechanisms, in spectrum management.

¹⁰ The Digital Video Broadcasting website, www.dvb.org, provides a worldwide listing of DVB-H deployments and trials.

¹¹ STiMi is a China Mobile Multimedia Broadcasting (CMMB) standard.

¹² Digital Video Broadcast-Terrestrial (DVB-T) is the technical standard planned for digital terrestrial broadcasting services in the GE-06 Treaty.

The European Commission intends that service and technology neutrality should be facilitated by Member States.

The Radio Spectrum Policy Group (RSPG), which draws its membership from the European Member States, supports the concept of service and technology neutrality as the prevailing way forward for spectrum management. It has adopted an Opinion¹³ on Wireless Access Policy for Electronic Communications Services (WAPECS) which proposes service and technology neutrality as a means of:

- ensuring effective and efficient spectrum use;
- facilitating converged services; and
- fostering future innovation and growth.

Cognisant of the twin objectives at a European level of promoting mobile reception of television services and of supporting service and technology neutrality, ComReg is considering two alternative licence types, outlined in section 3.1.1 below. Regardless of the option adopted, ComReg favours awarding the licence by means of an auction.

3.1.1 Purpose of this document

This document consults on ComReg’s proposed award options and respective licensing frameworks for 8MHz of UHF spectrum, between 470 MHz and 750 MHz, in the urban areas of Cork, Dublin, Galway, Limerick and Waterford.

Two possible licence options are proposed with an associated award allocation design, as detailed in Figure 2.0 below.

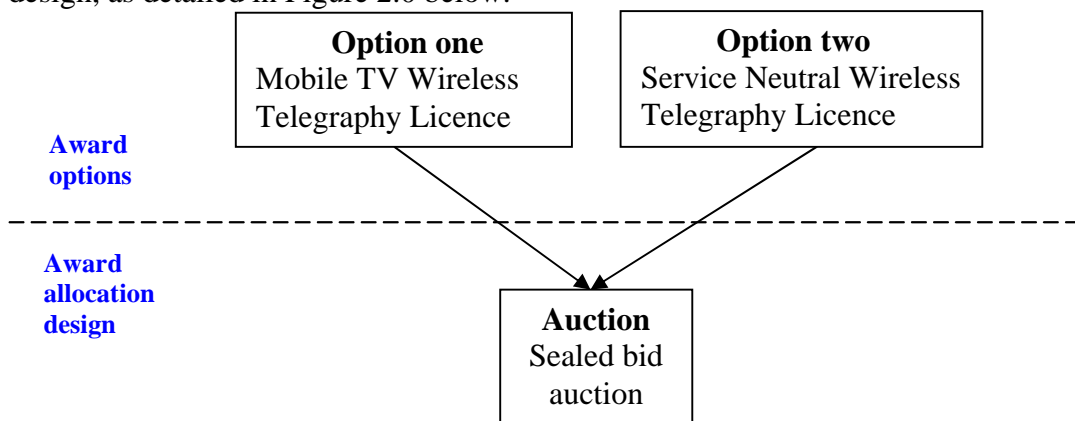


Figure 2.0 Schematic of two award options under consideration and award allocation design.

The first licence option is exclusively based on the award of a Mobile TV Wireless Telegraphy Licence to provide a Mobile TV Service using a dedicated terrestrial network approach in each of the 5 urban areas.

¹³ An RSPG Opinion represents the prevailing view of Member States but the view is not a binding one

The second licence option is based on the award of a Service Neutral Wireless Telegraphy Licence provided that:

1. the service can operate within the spectrum mask specified in the GE-06 Treaty;
2. the provisions of Articles 5.1.2e and 5.1.3 (envelope concept) of the GE-06 Treaty can be used; and
3. no additional interference is caused and no additional protection is required by the service.

It is noted that the second award option would provide the broadest possible opportunity for spectrum to be used by the market and would represent a further step by ComReg towards service and technology neutral licensing schemes for radio spectrum.

3.1.2 Layout of this document

This document has the following structure:

- **Section 4** sets out the background to the award of available spectrum;
- **Section 5** sets out the first Consultation Issue: Proposals on award options;
- **Section 6** sets out the second Consultation Issue: Licence Option 1 - Mobile TV Wireless Telegraphy Licence – Licensing framework
- **Section 7** sets out the third Consultation Issue: Licence Option 2 - Service Neutral Wireless Telegraphy Licence – Licensing framework
- **Section 8** sets out the final Consultation Issue: Licence award allocation design;

Appendix 1.0 sets out the consultation questions.

Appendix 2.0 sets out the spectrum mask for the available spectrum as described in the GE-06 Treaty.

Appendix 3.0 sets out an overview of the licensing models for Mobile TV Services on dedicated terrestrial networks in selected European Member States.

Appendix 4.0 sets out the draft technical conditions for the operation of a Mobile TV Wireless Telegraphy Licence.

4 Award of available spectrum and relevant information

This chapter sets out the background to the award of available spectrum.

4.1 Description of available spectrum

The spectrum to be awarded to the market is in the UHF spectrum band and has attractive coverage properties.

ComReg is meeting its immediate obligation to make spectrum available nationally in the UHF band for four multiplexes for digital terrestrial television (DTT). The existing four analogue television services also require significant amounts of UHF spectrum. In addition ComReg has an obligation to protect services in the UK. As a result, the amount of spectrum available in the band prior to analogue switch-off (ASO) here and in the UK is constrained.

Notwithstanding this constraint, ComReg will make a single 8MHz channel between 470 MHz and 750 MHz available, for which a licence can be awarded to use it in the urban areas of Cork, Dublin, Galway, Limerick and Waterford.

ComReg does not consider that a separate licence award for each of these areas would be appropriate given the limited amount of spectrum available. It considers that a single licence would therefore be appropriate which would cover all of these areas.

It should be noted that future releases of UHF spectrum, which could be used to extend the geographical service area of the licence so that the service can be offered on the wider basis, may be awarded by ComReg subject to:

- demand for it from the licensee;
- spectrum availability at planned analogue switch-off; and
- following an assessment of any future requirements for spectrum for DTT services.

Accordingly, any future spectrum which could be used to extend the geographical service area of this licence would attract an additional licence fee.

4.2 Mobile reception of multiplexes

ComReg indicated in the course of its consultation process on licence conditions for DTT that it intended to provide a separate licensing framework for mobile reception of television services (refer to ComReg documents 07/65, 07/90, 07/90(a) and 07/90(b), which set out licence conditions for fixed and portable reception of DTT multiplexes).

4.3 Legislative background

The Broadcasting (Amendment) Act 2007 (“2007 Act”) sets out the legislative framework for future licensing of digital broadcasting services, in particular DTT services, and provides a mechanism for ASO in Ireland.

The 2007 Act provides for the licensing of two national digital multiplexes to Radio Telefís Éireann (RTÉ) and four to the Broadcasting Commission of Ireland (BCI). A licence in respect of one digital multiplex was issued to RTÉ in December 2007. It is intended, if requested by the BCI, that ComReg will issue three national multiplex licences to the BCI prior to ASO. The benefits and obligations of these licences will be passed on to third parties in multiplex contracts offered by the BCI via a competitive process which launched on 7 March 2008.

Additionally, ComReg is empowered under the 2007 Act to issue, under the Wireless Telegraphy Acts, 1926 to 1988 (“Wireless Telegraphy Act”), multiplex licences, other than the six national licences specified for RTÉ and BCI identified above, following consultation with the Minister for Communications, Energy and Natural Resources and the BCI.

It is in this context that ComReg will make a single 8MHz channel between 470 MHz to 750 MHz available in each of the urban areas of Cork, Dublin, Galway, Limerick and Waterford (“the available spectrum”) for which a single multiplex licence could be issued.

ComReg considers that the available spectrum is compatible with the UHF spectrum used by the four analogue national television programming services. It also considers that the available spectrum is compatible with the current national DTT plan. In the event that the national DTT plan is changed, for example following contract negotiations between the BCI and its multiplex contractor, there may be a requirement for ComReg to change the frequency channel being made available to ensure that compatibility is maintained.

In addition to the objectives identified in Section 4.4, ComReg’s primary concerns in making this spectrum available include ensuring:

- the efficient management and use of the radio spectrum¹⁴;
- additional choice to end-users in terms of the services available, whether Mobile TV or otherwise;
- that the release of the available spectrum does not negatively impact the availability of spectrum for existing or future planned DTT Services (as set out in the 2007 Act); and

¹⁴ In carrying out its radio spectrum management function, ComReg, inter alia, must:

- ensure that measures taken are proportionate in ensuring the efficient management and use of the radio spectrum; and
- have regard to international developments with regard to the radio frequency spectrum.

- that any services deployed as a result of the release of the available spectrum will not materially degrade reception of existing or future planned DTT services for viewers.

The set of proposals and technical conditions identified in this consultation have been designed to ensure that these concerns are fully addressed.

4.4 EU Regulatory Objectives

Important objectives of the European Regulatory Framework for Electronic Communications¹⁵ introduced in Ireland in 2003 include:

- ensuring that the allocation and assignment of radio frequencies is based on objective, transparent, non-discriminatory and proportionate criteria;
- ensuring open, transparent and non-discriminatory procedures for the granting of licences under the Wireless Telegraphy Act; and
- in the context of the proposed issue of a limited number of licences for a particular class or description of apparatus for wireless telegraphy, giving due weight to the need to maximise benefits for users and to facilitate the development of competition.

This document is in line with the European Regulatory Framework, gives all interested parties the opportunity to submit written comments and enables ComReg to take all comments received into account before making a final decision.

4.5 Relevant considerations

In the context of the above legislative and regulatory framework, ComReg has taken into account the following relevant considerations in forming its proposals:

- the European Commission's initiatives for strengthening the internal market for Mobile TV;
- the potential for Mobile TV services given the current set of terrestrial technical standards and limited amount of available spectrum;
- the potential for other services given the limited amount of available spectrum;
- relevant sharing studies; and
- the potential for promoting service and technology neutrality.

¹⁵ See, in particular:

European Communities (ELECTRONIC COMMUNICATIONS NETWORKS AND SERVICES)(FRAMEWORK) Regulations 2003 (S.I. No. 307 of 2003) ("Framework Regulations"); and

European Communities (ELECTRONIC COMMUNICATIONS NETWORKS AND SERVICES)(AUTHORISATION) Regulations 2003 (S.I. No. 306 of 2003) ("Authorisation Regulations").

4.5.1 European Commission's initiatives for Mobile TV

The European Commission's initiatives¹⁶ in the area of strengthening the internal market for Mobile TV Services reference three key factors:

- regulatory - a regulatory environment conducive to innovation and investment;
- technical - standards and interoperability; and
- spectrum - ensuring quality spectrum for mobile TV services.

The European Commission also points to the merits in:

- reducing the current levels of regulatory uncertainty for Mobile TV Services between Member States;
- adopting the DVB-H technical standard, as it appears to be the strongest contender for future terrestrial Mobile TV services using the dedicated terrestrial network approach in Europe, and has advantages due to its compatibility with DTT services which use the DVB-T technical standard; and
- making a sub-band for Mobile TV services within the "digital dividend".¹⁷

The European Commission's comprehensive strategy for Mobile TV services in Europe has been largely endorsed by European Member States and has won the support of a large part of the Mobile TV industry including content producers, network operators, broadcasters, mobile service operators and equipment manufacturers.

The European Commission also stated that it remains firmly convinced that mobile broadcasting represents an opportunity to increase¹⁸:

- the consumption of television content, hence multiplying prime-time viewing and associated advertising revenues;
- the average revenue per-user on mobile phone subscriptions;
- the revenues for content creators; and
- an opportunity for software and hardware industries to bring new products to the market.

The European Commission also believes that digital rights management systems should be based on open standards.

¹⁶ COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS Strengthening the Internal Market for Mobile TV – COM (2007) 409 final Brussels 18.07.2007.

¹⁷ Digital dividend spectrum is defined by the European Commission as "the spectrum over and above the frequencies required to support existing [analogue] broadcasting services in a fully digital environment, including current public service obligations" COM (2007) 700.

¹⁸ DVB World Conference 2008 "Digital TV, Mobile TV: let's push for open technologies in Europe and worldwide" keynote address by Commissioner, Viviane Reding, Member of the European Commission responsible for Information Society and Media.

4.5.2 Potential for Mobile TV Services given the current set of technical standards and limited amount of available spectrum

In the available spectrum three terrestrial technical standards are particularly suited for Mobile TV services: DVB-H, Media-FLO and ISDB-T. Table 1.0 summarises the current available set of technical standards for Mobile TV Services in terms of suitability for particular spectrum bands.

Some countries promote home grown technical standards.¹⁹ For instance the ISDB-T technical standard is promoted in Japan and the T-DMB technical standard is promoted in Korea. Media-FLO, a proprietary technical standard, is promoted in the USA and the DVB-H technical standard is promoted in Europe.

Spectrum band	Mobile TV technical standard	Comment
VHF band (Band III) 174 to 230MHz	DAB-IP (T-DMB)	Limited multiplex capacity for programming services using this spectrum therefore potentially fewer services in the multiplex offering. Limited availability of handsets, reduces potential for spectrum harmonisation in EU – issue with integration of various receiving aerials
UHF band (Band IV, V) 470-862MHz	DVB-H; Media-FLO; ISDB-T	Scope for higher multiplex capacity to be assigned to the multiplex therefore scope for more programming services in the multiplex offering Scope for economies of scale potential for spectrum harmonisation in EU if DVB-H becomes the de-facto standard.
L-band 1452-1492MHz	DVB-H, Media-FLO, T-DMB	Networks costs more expensive in this band, more limited handsets availability
2GHz – 2.6GHz (3G TDD and S-Band)	TDtv; Streaming; DVB-SH; STiMi	3G streaming not broadcast, TDtv uses time division duplex (“TDD”) spectrum and may require guard bands. TDtv Mobile TV may be power limited given cellular network topology; DVB-SH could be used for gap fillers but spectrum framework changes may be required

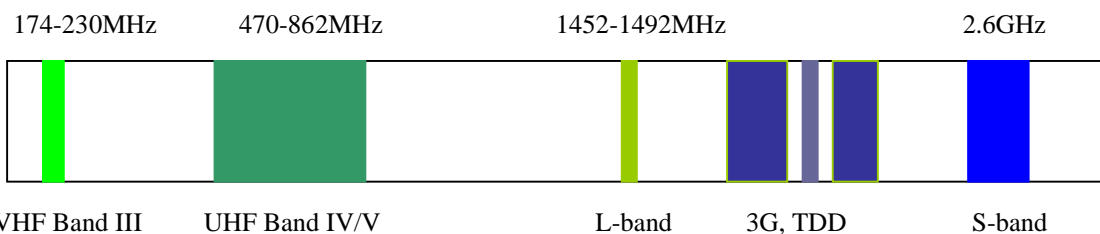


Table 1.0 Spectrum bands suitable for Mobile TV Services

¹⁹ Curwen, P., and Whalley, J., “Mobile television: technological and regulatory issues” Info, the Journal of policy, regulation and strategy for telecommunications, information and media, Vol. 10, 2008 No. 1. pp. 40-64

ComReg considers that the technical standard used for Mobile TV in Ireland should be a standard which has been approved by the European Telecommunications Standards Institute (ETSI).²⁰

4.5.3 Potential for other services given the limited amount of available spectrum

The technical properties of the available spectrum mean that it can provide good coverage inside buildings and can potentially carry information longer distances when compared to the capabilities of higher frequency bands. However, its full potential value may be restricted because it is only a single 8MHz channel and is limited to the urban areas of Cork, Dublin, Galway, Limerick and Waterford.

Limited mobile broadband services could be deployed using this spectrum, however there are likely to be more appropriate ways to deliver broadband in these urban areas.

Similarly, limited uplink and downlink services could be deployed using this spectrum, however, ComReg considers this an unlikely use as uplink and downlink technologies require spectrum to be either “paired” (frequency division duplex (FDD)) to avoid self interference or “unpaired” (time division duplex (TDD)) with a guard band to avoid interference to other services.

New peer-to-peer services could be deployed using this spectrum, however these types of file sharing services are more suited to networks that have a bandwidth greater than 8MHz.

ComReg therefore, considers that market players would be in a better position to decide on potential services than it would. Accordingly, the possibility of issuing the licence on a service and technology neutral basis is being considered subject to the following qualification:

- ComReg notes the available spectrum is suitable for DTT services or other applications planned using the DVB-T technical standard. In this regard, the BCI is currently holding a competition for national multiplex contracts to provide DTT services on a fixed and portable reception basis (excluding DVB-H). In light of this, ComReg considers that the available spectrum should be used for other applications, which could include broadcasting services targeted at mobile devices on a mobile reception basis (i.e. Mobile TV services) but which exclude broadcasting services targeted at fixed and portable devices on a fixed and portable reception basis (i.e. DTT services).

4.5.4 Sharing studies

ComReg recognises that the available spectrum is adjacent to existing and/or future planned DTT services which would use the DVB-T technical standard. It is cognisant of the interference planning issues associated with using different technical standards in the same spectrum band. Some studies on sharing and

²⁰ ETSI is the official European standards organisation.

compatibility between DVB and International Mobile Telecommunications (IMT) applications have been conducted within the International Telecommunications Union Radiocommunication sector (ITU-R) and protection ratios are known.

Where protection ratios are not known it may be necessary for interference mitigation techniques to be used to protect DTT services, which use the DVB-T technical standard, from other services using different technical standards. Potential interference mitigations techniques may include:

- antenna directivity;
- polarisation diversity and discrimination;
- antenna vertical radiation patterns;
- separation distances between stations;
- filtering;
- power reductions; and
- interference cancellation techniques;

Prevention of interference will be set as a licence condition, see section 6.1.9 and 7.1.4 of this document, and licensees would be required to fully comply with these conditions.

4.5.5 Potential for promoting service and technology neutrality

A technology and service neutral approach to the award option would align with the RSPG's WAPECS opinion, in particular by promoting service and technology neutrality as a means of:

- ensuring effective and efficient spectrum use;
- facilitating converged services; and
- fostering future innovation and growth.

In this regard, ComReg notes that the spectrum envelope concept from the GE-06 Treaty provides for flexibility and may therefore enable other potential uses of the available spectrum. A technology and service neutral award approach may also attract interest from a broader variety of spectrum users than would a Mobile TV approach, noting, however, the qualification raised in Section 4.5.3 above in relation to DTT services.

Due to the possibility and scope for the introduction of other non-broadcasting services, releasing this spectrum on a technology and service neutral basis could potentially benefit consumers in more or different ways than a Mobile TV Wireless Telegraphy Licence would.

4.5.6 Influence of these considerations on proposed award options

In light of the above considerations, ComReg is of the view that there is considerable merit in an award option based exclusively on the award of a Mobile TV Wireless Telegraphy Licence.

ComReg additionally sees merit in indicating a preference for a technical standard which has received approval from ETSI. In this regard, ComReg notes that the DVB-H technical standard is the European Commission's preferred technical standard for Mobile TV Services, using the dedicated terrestrial network approach. Nevertheless, ComReg would consider applications based on any technical standard which has received approval from ETSI.²¹

ComReg is therefore minded to award a Mobile TV Wireless Telegraphy Licence, based on an ETSI-approved technical standard, with the available spectrum.

An alternative to this award approach would be one based on the principles of service and technology neutrality, which would, in ComReg's opinion, provide an alternative set of merits to it. In particular, it would represent a further step by ComReg towards increasing the level of service and technology flexibility available to radio spectrum users.

ComReg therefore wishes to elicit from the market whether there is interest in the available 8 MHz spectrum on a technology and service neutral basis and would consider awarding a Service Neutral Wireless Telegraphy Licence.²²

4.6 Future international developments and increased spectrum flexibility

On 13 November 2007, the European Commission published proposals to reform spectrum management to increase flexibility and ensure greater use of market-led mechanisms through spectrum trading.

ComReg has previously considered the potential benefits of spectrum trading for specific licence categories and has concluded that secondary markets could potentially play a role in ensuring the efficient assignment and use of the spectrum in some areas. However, use of spectrum trading needs to be underpinned by primary legislation which is not yet the case in Ireland.

In the present matter, ComReg considers that the likely current demand for access to the available spectrum, from the Mobile TV Industry in particular, would appear to outweigh any future value that might be gained for adopting a "wait and see" approach.

Accordingly, spectrum trading is not provided for in this spectrum award.

²¹ Please note that the draft technical conditions set down in Appendix 3 may need to be amended to reflect other technical standards if they have been approved by ETSI.

²² ComReg acknowledges that potential Mobile TV Service provider(s) may also be interested in a Service Neutral Wireless Telegraphy Licence option given that such a licence would not contain specific rollout or wholesale service obligations.

5 Consultation issue: proposals on licence options

5.1 Introduction

The first licence option is exclusively based on the award of a Mobile TV Wireless Telegraphy Licence to provide a Mobile TV Service using a dedicated terrestrial network approach in each of the 5 main urban areas.

The second licence option is based on the award of a Service Neutral Wireless Telegraphy Licence provided that:

1. the service can operate within the spectrum mask specified in the GE-06 Treaty;
2. the provisions of Articles 5.1.2e and 5.1.3 (envelope concept) of the GE-06 Treaty can be used; and
3. no additional interference is caused and no additional protection is required by the service.

The most appropriate licence option will be selected by ComReg following consideration of responses to this consultation. ComReg considers that the final licence option should provide the necessary balance between the considerations highlighted in Section 4.5.

5.2 Licence option one: Mobile TV Wireless Telegraphy Licence

In light of the considerations discussed in Section 4.5, ComReg is of the view that sufficient supporting evidence exists for it to hold an auction exclusively for the allocation of a Mobile TV Wireless Telegraphy Licence (with the licence conditions set down in Section 6).

Q. 1. Do you agree with ComReg's proposal that its auction should be exclusively for a Mobile TV Wireless Telegraphy Licence using the available spectrum? If not, please support your answer with reference, in particular, to the considerations given in Section 4.5 of this document and any other supporting evidence.

5.3 Licence option two: Service Neutral Wireless Telegraphy Licence

ComReg also considers that the award of a Service Neutral Wireless Telegraphy Licence would provide the broadest possible opportunity for the available spectrum to be awarded to the market.

Q. 2. Do you consider there to be significant interest in the market for the available 8 MHz of spectrum on a technology and service neutral basis, having regard to the issues discussed in Section 4.5.3? If so, what services and applications do you consider could avail of this spectrum?

Q. 3. Do you consider that ComReg's auction should be for a licence awarded on a service and technology neutral basis subject to the qualification that it may not be used to provide DTT services? Please support your argument.

6 Consultation issue: Licence option 1 - Mobile TV Wireless Telegraphy Licence – Licensing framework

This section details the proposed licensing framework for Licence Option 1. Following consideration of responses to this consultation and if option were to be ComReg's preferred option, the final licensing framework would be set down in regulations to be published by ComReg under which a Mobile TV Wireless Telegraphy Licence could be issued.

6.1 Licence conditions for mobile reception of multiplexes

ComReg considers that the most likely technical option for a Mobile TV service in Ireland would be for one using a dedicated terrestrial network approach.

ComReg also recognises the need to build upon the licence conditions for fixed and portable reception of DTT multiplexes in order to provide a set of licence conditions appropriate for mobile reception of multiplexes using dedicated terrestrial networks.

Q. 4. Do you consider that the licence conditions for Mobile TV, on dedicated terrestrial networks in Ireland, should build on those set down for fixed and portable reception of DTT Multiplexes? If not, please explain what alternative methods should be used to develop licence conditions for Mobile TV services in Ireland in the context of the dedicated terrestrial network approach.

ComReg considers that the licence conditions should be set so as to provide the necessary regulatory certainty for the Mobile TV Industry in Ireland, using the dedicated terrestrial network approach, with the following types of licence conditions:

1. licence duration;
2. rollout obligations;
3. wholesale obligations;
4. provision of information;
5. sanctions for non-compliance with licence conditions;
6. other authorisations and responsibilities;
7. variation of licence;
8. non-ionising radiation;
9. resolution of interference;
10. technical conditions; and
11. Mobile TV Wireless Telegraphy Licence fees.

Q. 5. Do you consider that the above types of licence conditions would provide the necessary regulatory certainty to the market for the provision of Mobile TV Services using the dedicated terrestrial network approach in Ireland? If not, please specify any additional licence conditions that should apply.

6.1.1 Licence duration

ComReg recognises that considerable capital expenditure would be required to establish a Mobile TV Service using the dedicated terrestrial network approach in the five urban areas identified. ComReg also recognises that any requirement to change the licensed frequency, within the range 470 MHz to 750MHz, to maintain compatibility with the national DTT plan may involve a cost to the licensee. The licence period for Mobile TV Wireless Telegraphy Licence would be set so as to provide a balance between the following factors:

- the need for infrastructure investment in the main areas;
- the need for a return on that investment;
- the need to achieve and grow a base of subscribers;
- the need to maximise benefits for consumers; and
- the need to facilitate competition by ensuring that wholesale service is provided on fair, transparent and non-discriminatory terms to alternative providers of distribution services to end-users.

ComReg considers that a Wireless Telegraphy Licence for Mobile TV of duration of 10 years should allow for the achievement of the required balance.

ComReg however, wishes to hear from respondents as to whether other factors should also be considered. For example, the scheduling of infrastructure construction given that DTT services will be rolled out on many of the high transmission sites in Ireland over the coming years. Respondents may wish to indicate whether a network deployment model similar to that used in the Mobile TV trial in Dublin would be adopted (i.e. whether the network would be based on high-tower high-power or on dense low-power cellular deployment, or a combination of both).

Q. 6. Do you consider that the proposed length of the Mobile TV Wireless Telegraphy Licence is appropriate? If not, how long should the licence period be for? Please give reasons for your proposal.

Q. 7. Do you consider that other factors might also need to be considered in determining the length of the licence?

6.1.2 Rollout obligations

In the interests of the effective use of the radio spectrum and maximising the benefits for users, ComReg proposes to establish rollout obligations as a condition of any Mobile TV Wireless Telegraphy Licence. The proposed rollout obligations would require that the Mobile TV Service be accessible by end-users in the five urban areas within 24 months of any licence award.

For the purpose of measuring end-user accessibility and bearing in mind the commercial nature of the Mobile TV Service, ComReg would require, within the 24 month rollout period, that the main transmitter stations would:

- be commissioned, on-air and transmitting the Mobile TV service for reception by end-users in the five areas; and
- be transmitting in accordance with the effective radiated power characteristics as would be set down in the technical schedule attached to any licence which would be issued by ComReg.

ComReg notes that this milestone would depend, in part, on the network deployment approach used by the licensee (e.g. high-tower high-site, low-power dense cellular network deployment or a combination of both).

Q. 8. Do you consider that the Mobile TV Service should be accessible by end-users in the five urban areas within 24 months of the licence award? If not, what rollout schedule should apply?

Q. 9. Do you consider, as a means of measuring end-user accessibility, that the main transmitter sites should be commissioned, on-air and transmitting the multiplex offering in accordance with effective radiated power characteristics as would be set down in the technical schedule attached to licence? If not, please explain how should rollout conditions be set and measured for compliance?

6.1.3 Wholesale service obligations

Having cognisance of the licensing model for Mobile TV on dedicated terrestrial networks in a number of European countries (see Appendix 3.0) and having regard to the need to maximise benefits for users and to facilitate the development of competition, ComReg believes that a wholesale service should be provided on fair, transparent and non-discriminatory terms. Accordingly, ComReg proposes to establish wholesale obligations as a condition of any Mobile TV Wireless Telegraphy Licence.

Ensuring such wholesale service would require obligations in relation to the following:

- wholesale access to the common content carried on the multiplex;
- transparency of terms and conditions relating to wholesale access;
- non-discrimination and fairness in relation to the terms and conditions for equivalent wholesale access;
- access to capacity on fair non-discrimination terms, subject to capacity constraints on the multiplex, to enable providers of distribution services to end-users to provide one programme service of their own within the multiplex; and
- an appropriate dispute resolution mechanism in relation to these obligations.²³

While most of the content would likely be common to all operators, ComReg considers that in order to allow some differentiation between service offerings, some multiplex capacity should be reserved for other providers of distribution services to end-users. ComReg proposes capacity for one programme service for each of up to four other providers of distribution services to end users should be reserved.

Q. 10. Do you see merit in licence obligations that would seek to ensure wholesale service is provided on fair, reasonable and non-discriminatory terms? Do you consider that these obligations would ensure that wholesale service is effectively provided? If not, what additional obligations may be required?

Q. 11. Do you see merit in some multiplex capacity being reserved for providers of distribution services to end-users? In your opinion how many programme services should be reserved? Please refer to bit-rate, compression and other relevant technical data in your response.

²³ See, for example, Regulation 31 of the Framework Regulations 2003 (S.I. No. 307 of 2003)

6.1.4 Provision of information

It is a standard provision in most spectrum licences issued by ComReg that the licensee is obliged to provide whatever information is requested by ComReg to assess the licensee's compliance with the requirements of the licence.

6.1.5 Sanctions for non-compliance with licence conditions

In issuing any Mobile TV Wireless Telegraphy Licence ComReg needs to be satisfied that the licensee will comply with the licence terms. In the event of non-compliance, ComReg reserves the right to, as appropriate, terminate, suspend, reduce the geographical area of the licence and/or reduce the duration of the Mobile TV Wireless Telegraphy Licence, and re-allocate any spectrum thus released.

6.1.6 Other authorisations and responsibilities

The licensee will be required to obtain all other authorisations necessary, and/or fulfil other obligations in respect of the Mobile TV Services which it plans to provide. These matters will not be covered by the ComReg licensing process and the onus will be on the licensee to obtain all such approvals, consents, licences, permissions, and authorisations required in connection with the provision of the service

6.1.7 Variation of licence

At any time, ComReg may amend, or vary, the terms of the licence, following such public consultation as is deemed appropriate by ComReg, provided that the licensee is given reasonable opportunity to make representations regarding the proposed amendment or variation and that ComReg has considered those representations.

6.1.8 Non-ionising radiation

It is a standard provision in most spectrum licences issued by ComReg that the licensee shall ensure that non-ionising radio emissions from each radio installation operated under its licence are within the limits specified by the guidelines published by the International Commission for Non-Ionising Radiation Protection (ICNIRP) and any radiation emission standards adopted and published from time to time by ICNIRP or its successors or any emission standards specified by national and EU Law.

6.1.9 Prevention of Interference

In the event that ComReg is satisfied that the licensee is causing interference or the operation of the licensee's equipment represents an immediate and serious threat to the safety, security or health of the general public, or creates or will create harmful interference, then it may take such measures as are necessary to ensure that any such threat is avoided.

6.1.10 Technical conditions (see Appendix 4.0)

The licensee must comply with the technical conditions set down by ComReg. Draft technical conditions are set down in Appendix 4.0. ComReg welcomes any comments on these conditions in particular in relation to modulation modes.

6.1.11 Mobile TV Wireless Telegraphy Licence Fees

ComReg considers that the licence fee for the Mobile TV Wireless Telegraphy Licence should be set at €340,000 per annum.

The following considerations have been taken into account in formulating ComReg's proposals in relation to the level of this proposed fee:

- the potential Mobile TV Service subscriber base, based on the potential coverage of circa 40% of the population by the service, would yield approximately 1.6 million potential subscribers (assuming a wholesale service is licensed) which compares favourably to the potential customer base of 1.46 million households in Ireland, which the commercial operators of the DTT Service could hope to capture from their nationwide DTT networks;
- based on what would seem to be a very conservative take up figure, of between 15% to 20%, for the number of subscribers which a Mobile TV operator might expect to capture from the total pool of 1.6 million potential subscribers, and on the basis of a subscription fee of €10 per month, the total revenues generated could be in the order of between €28m to €38m per annum;
- the ratio between the transmitter capital cost and subscriber base is much less for the Mobile TV Service as compared to the DTT Services given that there is no universal coverage requirement;
- ComReg recognises, however, that the service would be starting from a point of no customers and would take time to become established with a subscriber base;
- It also recognises that the capital costs, which would not be insignificant, annual operational expenditure costs and acquisition costs for content are factors which impact the level of proposed fee; and
- Bearing in mind these considerations an annual licence fee of €340,000 is proposed.

Q. 12. Do you consider the proposed Mobile TV Wireless Telegraphy Licence fee to be appropriate? If not, please provide reasons for your view.

7 Consultation issue: Licence option 2 - Service Neutral Wireless Telegraphy Licence – Licensing framework

This section details the proposed licensing framework for Licence Option 2. Following consideration of responses to this consultation and if option 2 were to be ComReg's preferred option, the final licensing framework would be set down in regulations to be published by ComReg under which a Service Neutral Wireless Telegraphy Licence could be issued.

7.1 Licence conditions for service and technology neutral licence

ComReg considers that the following licence conditions should be set so as to provide the necessary regulatory certainty:

1. Licence duration;
2. Use of GE-06 Plan digital entries;
3. GE-06 spectrum mask;
4. Prevention of interference;
5. Provision of information including statements of authorised apparatus and service (which must exclude DTT services);
6. Sanctions for non-compliance with licence conditions;
7. Other authorisations and responsibilities;
8. Non-ionising radiation; and
9. Service Neutral Wireless Telegraphy Licence fees.

7.1.1 Licence duration

Many of the factors which are relevant to the potential duration of a Mobile TV Wireless Telegraphy Licence are relevant in this case also.

ComReg recognises that consideration capital expenditure would be required to establish a network to serve the five main urban areas in question. It recognises the need to establish a balance between the following:

- the need for infrastructure investment;
- the need to achieve a return on that investment;
- the need to establish and grow a base of subscribers; and
- the need to maximise benefits for consumers.

ComReg considers that the duration of the Service Neutral Wireless Telegraphy Licence should have a duration of 10 years in order to achieve that balance.

Q. 13. Do you consider that the proposed length of the Service Neutral Wireless Telegraphy licence is appropriate? If not, how long should the licence period be for? Please give reasons for your proposal.

Q. 14. Do you consider that other factors might also need to be considered in determining the length of the licence?

7.1.2 Available spectrum in Cork, Dublin, Galway, Limerick and Waterford.

The available spectrum was determined using the characteristics listed in tables 2.0 and 2.1 below.

Location.	Effective Radiated Power (E.R.P.)	Polarisation
Dublin	Up to 44 dBW	Horizontal
Galway	Up to 37 dBW	Horizontal
Cork	Up to 40 dBW	Horizontal
Limerick	Up to 37 dBW	Horizontal
Waterford	Up to 37 dBW	Horizontal

Table 2.0 Location specific available spectrum

Potential licensees may operate a network of transmitter stations based upon the characteristics listed in Table 2.0 and Table 2.1, subject to compliance to compliance with GE-06 spectrum mask and relevant licence obligations.

For the purposes of identifying spectrum, the following site locations given in Table 2.1 below were used.

Site Name	Location	Latitude	Longitude	Antenna Height
Three Rock	Dublin	53° N 14' 49"	006° W 14' 11"	100 m.
Tonabroky	Galway	53° N 17' 44"	009° W 06' 44"	60 m.
Spur Hill	Cork	51° N 51' 21"	008° W 31' 00"	60 m.
Woodcock Hill	Limerick	52° N 43' 11"	008° W 41' 22"	60 m.
Waterford	Waterford	52° N 15' 48"	007° W 08' 01"	60 m

Table 2.1 Location specific available spectrum

Use of this spectrum will be subject to obligations set out in International Treaties and co-ordination will be required. Consideration will be given to alternative networks which may be suggested by potential licensees. This will be subject to spectrum availability and international coordination.

7.1.3 GE-06 spectrum mask

In order to establish a Service Neutral Wireless Telegraphy Licence, ComReg considers it necessary to set out technical rules with respect to the spectrum used by

the Electronic Communications Network (ECN)²⁴ and/or Service (ECS)²⁵ which might operate using the licence.

These rules are not intended to be burdensome on the licensee but ComReg considers that some technical rules are necessary in order to enable the available spectrum to be used by service neutral applications, while at the same time taking into account the frequency restrictions designed to permit co-existence with existing or future planned services including for example, DTT and/or Mobile Multimedia Services.²⁶

Co-existence between services using the available spectrum and the remainder of the UHF spectrum will be achieved provided the Service Neutral Wireless Telegraphy Licence is operated within the following rules:

1. the service can operate within the spectrum mask specified in the GE-06 Treaty;
2. the provisions of Articles 5.1.2e and 5.1.3 (envelope concept) of the GE-06 Treaty can be used; and
3. no additional interference is caused and no additional protection is required by the service.

The envelope concept of the GE-06 Treaty implies that the GE-06 Plan entries could be used for services other than broadcasting services, with characteristics that may be different from those appearing in the GE-06 Plan but operating within the envelope of their GE-06 Plan entry (which is based on DVB-T technical standard). Please refer to Appendix 2.0.

²⁴ ECN is defined in the Framework Regulations to mean transmission systems and, where applicable, switching or routing equipment and other resources which permit the conveyance of signals by wire, by radio, by optical or by other electromagnetic means, including satellite networks, fixed (circuit- and packet-switched, including Internet) and mobile terrestrial networks, electricity cable systems, to the extent that they are used for the purpose of transmitting signals, networks used for radio and television broadcasting, and cable television networks, irrespective of the type of information conveyed.

²⁵ ECS is defined in the Framework Regulations to mean a service normally provided for remuneration which consists wholly or mainly in the conveyance of signals on electronic communications networks, including telecommunications services and transmission services in networks used for broadcasting, but which excludes –

(a) a service providing, or exercising editorial control over, content transmitted using electronic communications networks and services, and

(b) an information society service, as defined in Article 1 of Directive 98/34/EC, which does not consist wholly or mainly in the conveyance of signals on electronic communications networks

²⁶ ITU (2006) "The Regulatory Environment for Future Mobile Multimedia Services – Towards More Flexible Spectrum Regulation and Its Relevance for the German Market" available at http://www.itu.int/osg/spu/ni/multimobile/papers/MMS_flexiblespectrumstudy_060606.pdf

7.1.4 Prevention of Interference

In the event that ComReg is satisfied that the licensee is causing interference or the operation of the licensee's equipment represents an immediate and serious threat to the safety, security or health of the general public, or creates or will create harmful interference, then it may take such measures as are necessary to ensure that any such threat is avoided.

7.1.5 Provision of information including statements of authorised apparatus and services being provided (which must exclude DTT services)

It is a standard provision in most spectrum licences issued by ComReg that the licensee is obliged to provide whatever information is requested by ComReg to assess the licensee's compliance with the requirements of the licence.

In addition, and having regard to the need to ensure that any emissions from transmitter stations deployed by a licensee would not materially degrade reception of existing or future planned DTT services for viewers, ComReg considers it necessary for the licensee to provide a statement of authorised apparatus which could be used to assess the compatibility of the licensee's transmitter stations with existing or future planned DTT transmitter stations. The licensee would also be required to provide a statement of the service it would intend to provide with confirmation that it would not provide DTT services.

The statement, which would be modified to reflect any subsequent changes to the technology or service made by the licensee, would require the licensee to provide the following details:

- type of service to be provided and confirmation that DTT Services would not be provided;
- description of apparatus and transmission characteristics;
- places at which the licensee would keep and have possession of the apparatus;
- transmission and spectrum usage characteristics;
- receiver sensitivity and characteristics; and
- any other details required by ComReg for undertaking sharing studies and ensuring compliance.

ComReg also considers that the licensee's apparatus must:

- be liable to inspection by authorised officers of ComReg;
- conform to the Radio and Telecommunications Terminal Equipment (R&TTE) Directive;
- not cause harmful interference;
- be maintained and installed in accordance with relevant ETSI standards; and
- comply with the GE-06 Spectrum Mask.

Q. 15. Do you consider that the statement of authorised apparatus should include any additional information?

7.1.6 Sanctions for non-compliance with licence conditions

In issuing any Service Neutral Wireless Telegraphy Licence ComReg needs to be satisfied that the licensee will comply with the licence conditions. In the event of non-compliance, ComReg reserves the right to, as appropriate, terminate, suspend, reduce the geographical area of the licence and/or reduce the duration of the Service Neutral Wireless Telegraphy Licence, and re-allocate any spectrum thus released.

7.1.7 Other authorisations and responsibilities

The licensee will be required to obtain all other authorisations necessary, and/or fulfil other obligations in respect of the services which it plans to provide. These matters will not be covered by the ComReg licensing process and the onus will be on the licensee to obtain all such approvals, consents, licences, permissions, and authorisations required in connection with the provision of the service

7.1.8 Non-ionising radiation

It is a standard provision in most spectrum licences issued by ComReg that the licensee shall ensure that non-ionising radio emissions from each radio installation operated under its licence are within the limits specified by the guidelines published by ICNIRP and any radiation emission standards adopted and published from time to time by ICNIRP or its successors or any emission standards specified by national and EU Law.

7.1.9 Service Neutral Wireless Telegraphy Licence Fees

ComReg considers that a Service Neutral Wireless Telegraphy Licence could attract a higher annual licence fee than the Mobile TV Wireless Telegraphy Licence because it provides more flexibility to the potential licensee, and therefore the spectrum could be considered as an element of Ireland's potential digital dividend.

ComReg currently envisages that an annual licence fee of €650,000 per annum would be appropriate for the Service Neutral Wireless Telegraphy Licence.

The following considerations have been taken into account in formulating ComReg's proposals in relation to the level of this proposed fee:

- rollout conditions requiring that the spectrum is appropriately used in each of the five urban areas within two years of the commencement date of the licence;
- the Service Neutral Wireless Telegraphy Licence could be used to provide a Mobile TV service in Ireland without the proposed wholesale obligations;
- the licence could be used to provide any other service, except DTT, which the licensee considers to be commercially viable and again wholesale access would not be mandated;

- ComReg considers licensees would only use the spectrum for other services if these services were more profitable than would be a Mobile TV Service. Market opportunity studies from trials of Mobile TV Services in Europe indicate that at a minimum, 41% of trial participants would be willing to pay for a Mobile TV offering which appealed them²⁷;
- based on what would seem to be a very conservative take up figure, of between 15% to 20%, for the number of subscribers which a Mobile TV operator might expect to capture from the total pool of 1.6 million potential subscribers with this licence, and on the basis of a subscription fee of €10 per month, the total revenues generated could be in the order of between €28m to €38m per annum;
- although there are no licence fees for digital dividend spectrum calculated on a service and technology neutral basis in other countries with which to benchmark, ComReg notes that one research paper has suggested that the minimum social benefits per person from re-allocating 200MHz of spectrum in the UHF frequency band to non-broadcasting applications in Ireland would be US\$1,334 per capita²⁸ annually;
- therefore, with a potential subscriber base of 1.6 million subscribers and with the re-allocation of 8MHz of spectrum the resulting minimum total social value could be of the order €54m for the available spectrum; and
- Ofcom has estimated the total value to UK citizens and consumers of 112MHz of digital dividend spectrum of between £5-10bn net present value over 20 years²⁹.

Q. 16. Do you consider that the Service Neutral Wireless Telegraphy Licence should attract a higher licence fee than that proposed for the Mobile TV Wireless Telegraphy Licence? What other considerations should be taken into account in setting the licence fee for any Service Neutral Wireless Telegraphy Licence fee?

Q. 17. Do you consider the proposed annual fee for a Service Neutral Wireless Telegraphy Licence to be adequate? If not, please provide an alternative suggestion outlining your considerations.

²⁷ DVB World Conference 2007 presentation from Mobile DTV Alliance

²⁸ Hazelitt et al "The social value of TV band spectrum in European countries" Info, the Journal of policy, regulation and strategy for telecommunications, information and media, Vol. 8 No. 2. 2006, pp. 62 – 73. At an exchange rate of €1:\$1.56 the social value per person would be €855.

²⁹ Digital Dividend Review "A statement on our approach to awarding the digital dividend" December 2007

8 Consultation issue: Award allocation design

8.1 Award allocation design: auction

ComReg is committed to employing cost-effective and transparent procedures in order to facilitate market entry and stimulate cross platform competition for the benefits of end-users and where appropriate use market led tools to assign licences.

In ComReg's experience, auctions have proven to be a quick, fair and transparent method for assigning spectrum and, as a result, auctions are the preferred assignment method where the demand for spectrum exceeds its supply. Where auctions have been used, ComReg has purposefully used a simple auction process, the first- or second-price single-sealed bid format.

Having regard to the above, ComReg proposes to award and assign a licence for 8MHz of spectrum using a single sealed bid first price auction.

In recognition of licence fees, which relate to spectrum use and which would be set down as licence conditions, ComReg has purposely chosen a low auction reserve price, which relates to an initial spectrum access charge and would offset the costs to ComReg associated with providing the necessary access. It considers that the auction should be a single sealed bid first price auction with a reserve price of €100,000.

Q. 18. Would you be interested in participating in a single sealed bid first price auction with a reserve price of €100,000 to assign either a Mobile TV Wireless Telegraphy Licence or a Service Neutral Wireless Telegraphy Licence. Please indicate which award option would be your preference.

9 Submitting Comments

All comments are welcome, however it would make the task of analysing responses easier if comments were referenced to the relevant question numbers from this document.

The consultation period will run from 18 June to 30 July 2008 during which the Commission welcomes written comments on any of the issues raised in this paper.

Having analysed and considered the comments received, ComReg will review the award options and related licensing issues and publish a report on the consultation in August 2008 which will, inter alia, summarise the responses to the consultation.

In order to promote further openness and transparency ComReg will publish all respondents' submissions to this consultation, subject to the provisions of ComReg's Guidelines on the Treatment of Confidential Information – ComReg 05/24. It is requested that electronic submissions be submitted in an-unprotected format so that they can be appended into the ComReg submissions document for publishing electronically.

Please note

ComReg appreciates that many of the issues raised in this paper may require respondents to provide confidential information if their comments are to be meaningful.

As it is ComReg's policy to make all responses available on its web-site and for inspection generally, **respondents to consultations are requested to clearly identify confidential material and place confidential material in a separate annex to their response.**

Such material will be treated in accordance with the provisions of ComReg's Guidelines on the Treatment of Confidential Information – ComReg document 05/24.

Appendix 1 – Consultation Questions

- Q. 1. Do you agree with ComReg’s proposal that its auction should be exclusively for a Mobile TV Wireless Telegraphy Licence using the available spectrum? If not, please support your answer with reference, in particular, to the considerations given in Section 4.5 of this document and any other supporting evidence. 19
- Q. 2. Do you consider there to be significant interest in the market for the available 8 MHz of spectrum on a technology and service neutral basis, having regard to the issues discussed in Section 4.5.3? If so, what services and applications do you consider could avail of this spectrum? 20
- Q. 3. Do you consider that ComReg’s auction should be for a licence awarded on a service and technology neutral basis subject to the qualification that it may not be used to provide DTT services? Please support your argument. ... 20
- Q. 4. Do you consider that the licence conditions for Mobile TV, on dedicated terrestrial networks in Ireland, should build on those set down for fixed and portable reception of DTT Multiplexes? If not, please explain what alternative methods should be used to develop licence conditions for Mobile TV services in Ireland in the context of the dedicated terrestrial network approach. 21
- Q. 5. Do you consider that the above types of licence conditions would provide the necessary regulatory certainty to the market for the provision of Mobile TV Services using the dedicated terrestrial network approach in Ireland? If not, please specify any additional licence conditions that should apply. 22
- Q. 6. Do you consider that the proposed length of the Mobile TV Wireless Telegraphy Licence is appropriate? If not, how long should the licence period be for? Please give reasons for your proposal. 23
- Q. 7. Do you consider that other factors might also need to be considered in determining the length of the licence? 23
- Q. 8. Do you consider that the Mobile TV Service should be accessible by end-users in the five urban areas within 24 months of the licence award? If not, what rollout schedule should apply? 23
- Q. 9. Do you consider, as a means of measuring end-user accessibility, that the main transmitter sites should be commissioned, on-air and transmitting the multiplex offering in accordance with effective radiated power characteristics as would be set down in the technical schedule attached to licence? If not, please explain how should rollout conditions be set and measured for compliance? 23
- Q. 10. Do you see merit in licence obligations that would seek to ensure wholesale service is provided on fair, reasonable and non-discriminatory terms? Do you consider that these obligations would ensure that wholesale

service is effectively provided? If not, what additional obligations may be required? 24

Q. 11. Do you see merit in some multiplex capacity being reserved for providers of distribution services to end-users? In your opinion how many programme services should be reserved? Please refer to bit-rate, compression and other relevant technical data in your response. 24

Q. 12. Do you consider the proposed Mobile TV Wireless Telegraphy Licence fee to be appropriate? If not, please provide reasons for your view. 26

Q. 13. Do you consider that the proposed length of the Service Neutral Wireless Telegraphy licence is appropriate? If not, how long should the licence period be for? Please give reasons for your proposal. 28

Q. 14. Do you consider that other factors might also need to be considered in determining the length of the licence? 28

Q. 15. Do you consider that the statement of authorised apparatus should include any additional information? 31

Q. 16. Do you consider that the Service Neutral Wireless Telegraphy Licence should attract a higher licence fee than that proposed for the Mobile TV Wireless Telegraphy Licence? What other considerations should be taken into account in setting the licence fee for any Service Neutral Wireless Telegraphy Licence fee? 32

Q. 17. Do you consider the proposed annual fee for a Service Neutral Wireless Telegraphy Licence to be adequate? If not, please provide an alternative suggestion outlining your considerations. 32

Q. 18. Would you be interested in participating in a single sealed bid first price auction with a reserve price of €100,000 to assign either a Mobile TV Wireless Telegraphy Licence or a Service Neutral Wireless Telegraphy Licence. Please indicate which award option would be your preference. 34

Appendix 2 – GE-06 Treaty spectrum mask for DVB-T in 8 MHz channels

Two spectrum masks are specified in Fig. 1-0 and the associated Table 1-0. The upper curve defines the spectrum mask for the non-critical cases and the lower curve defines the spectrum mask for the sensitive cases.

FIGURE 1-0

Symmetrical spectrum masks for non-critical and sensitive cases

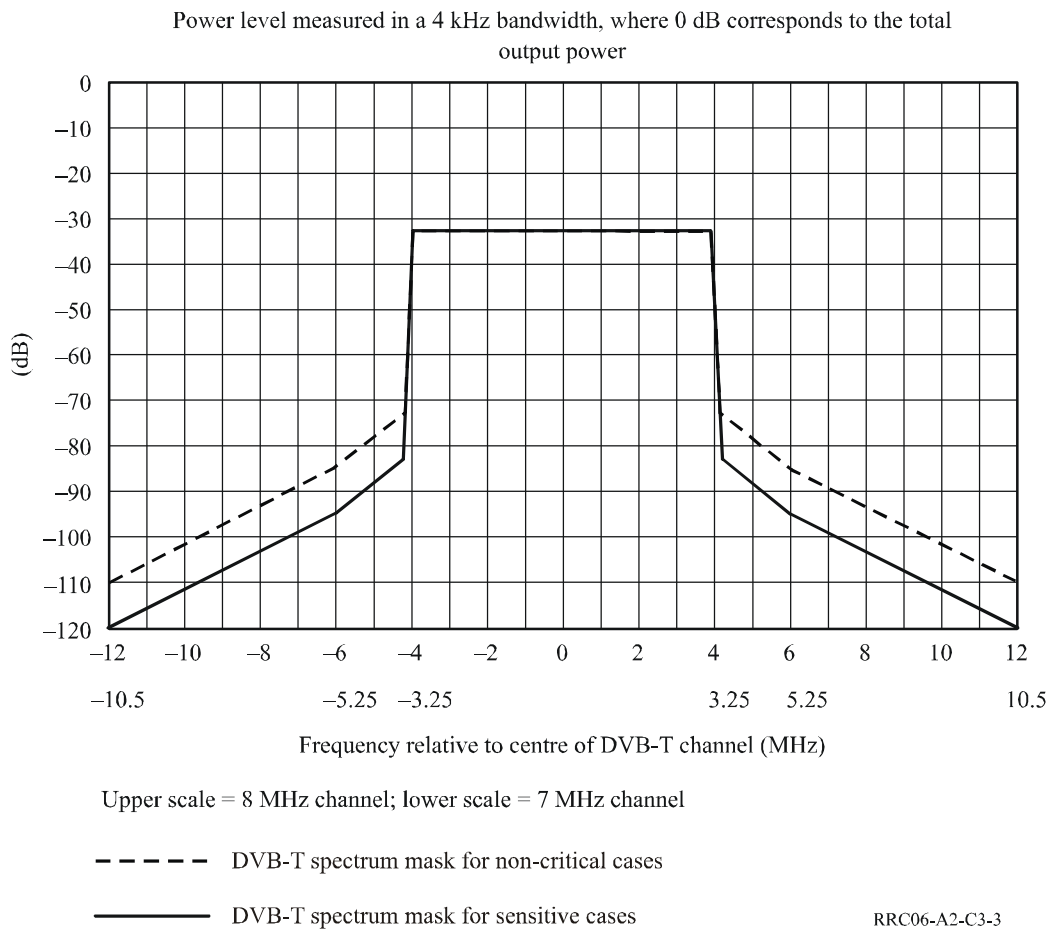


TABLE 1-0

Symmetrical spectrum masks for non-critical and sensitive cases

8 MHz channels Breakpoints		
	Non-critical cases	Sensitive cases
Relative frequency	Relative level (dB)	Relative level (dB)

(MHz)		
-12	-110	-120
-6	-85	-95
-4.2	-73	-83
-3.9	-32.8	-32.8
+3.9	-32.8	-32.8
+4.2	-73	-83
+6	-85	-95
+12	-110	-120

A licensee must demonstrate that the proposed technology conforms with the spectrum mask as defined in Fig 1-0 and associated Table 1-0 above.

Appendix 3 – Overview of licensing models for Mobile TV on dedicated terrestrial networks in selected European Member States

Appendix 4 – Draft Technical Conditions for Mobile TV
Wireless Telegraphy Licence