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## STRATEGY FOR MANAGING THE RADIO SPECTRUM AND SPECIFIC SERVICES

SPECTRUM MANAGEMENT STRATEGY STATEMENT 2005 - 2007

Commission for  
**Communications Regulation**

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## Strategy for Managing the Radio Spectrum and Specific Services

### 5.1. Key Strategic Goals for Spectrum Management

#### 5.1.1. Facilitating Access to Radio Spectrum

ComReg aims to:

- ensure flexibility and ease of access to radio spectrum to accommodate technological advances and market factors in order to leverage Ireland's competitive advantage;
- adapt the allocation of, and access to, the spectrum resource to provide spectrum that best meets the needs of the user;
- be a European leader in the adoption of new and innovative wireless services;
- support and promote innovation, research and development in new radiocommunication techniques, spectrum-based services and applications;
- review current procedures with a view to bringing licence duration more in line with investment cycles, noting that a radio licence does not confer ownership nor a continued right to a particular radio frequency;
- ensure that current licensing schemes are appropriate and simple to use and administer so that licences can be issued quickly;
- continue encouraging and authorising radiocommunication system trials and new technology experiments in frequency bands appropriate to the intended applications and subject to the availability of suitable spectrum.

#### 5.1.2. Maximising Economic and Social Benefits

- ComReg will seek opportunities to promote the use of radio systems to enhance Ireland's international competitiveness and to promote competition at home in infrastructure and services;
- ComReg will continue to consult regularly and widely on spectrum issues in order to have the benefit of industry and other stakeholders' views when making decisions;
- ComReg will continue to ensure that spectrum continues to be available to meet the needs of public safety, emergency services and safety of life services in view of their vital role in the safeguarding of human life, property and national security;
- Where appropriate, ComReg will seek to liberalise the constraints applied to spectrum rights of use, to permit the deployment of alternative technologies or services, where harmful interference does not result;
- ComReg will seek opportunities to promote the take-up of the innovative test and trial licence scheme in order to position Ireland as a manufacturing base and test-bed for wireless system testing and service trials;
- Where appropriate, ComReg will facilitate and encourage the use of wireless technology to support regional development objectives.

#### 5.1.3. Promoting the Efficient Use of Scarce Spectrum Resources

- ComReg seeks to optimise the use of the spectrum resource by encouraging the use of spectrum efficient radio systems and the use of the most appropriate frequency band for each application in order to maximise spectrum usage in critical frequency bands;

- ComReg is considering further arrangements for the introduction of Administrative Incentive Pricing in order to encourage efficient use of the spectrum, with the intention of bringing the demand for spectrum into equilibrium with its supply;
- ComReg is considering opportunities to permit one or more forms of trading in spectrum rights (spectrum trading) in relation to specific services, to test its appropriateness and operation in the Irish market;
- ComReg will work with the Government to expedite the introduction of new legislation to facilitate more effective and flexible use of radio spectrum.

#### 5.1.4. Ensuring Compliance with National and International Requirements and the Avoidance of Harmful Interference

- ComReg works to protect Ireland's national interests when harmonising and co-ordinating spectrum utilisation with other countries and regional and international organisations;
- ComReg is committed to planning and managing the utilisation of the spectrum resource in accordance with both national and international legislation;
- Where appropriate, ComReg will require compliance with international agreements on frequency usage and technical standards as a requirement for spectrum access, recognising that these agreements are necessary for harmonious system operation, efficient spectrum management, spectrum utilisation, compatibility, competitiveness and avoidance of interference;
- ComReg will continue to represent and promote Irish positions with regard to all radio services in the relevant international fora, at both a regional (European) and Global level, within the EU, ITU and CEPT.

These broad strategic goals are reflected in ComReg's positions regarding spectrum for specific services.

## 5.2. ComReg Strategy at the International Level

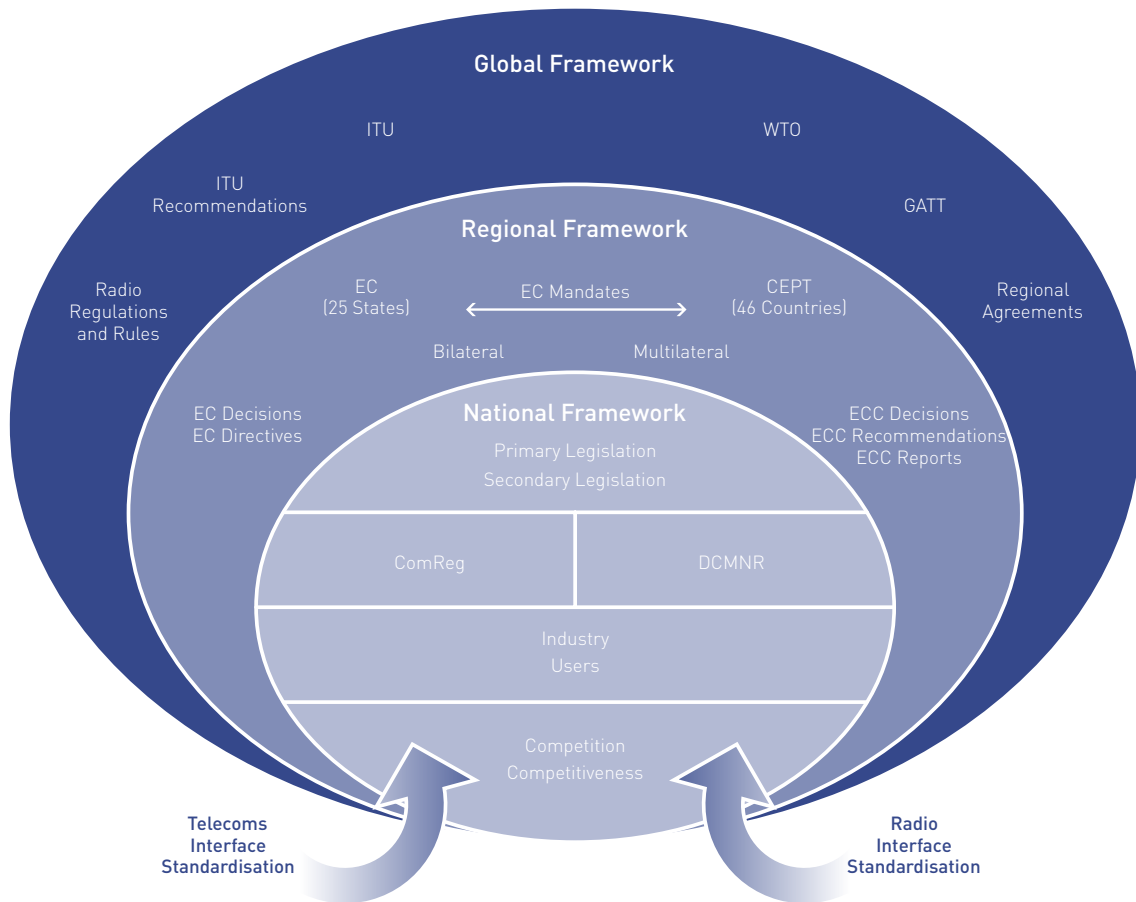
### 5.2.1. Introduction - The International and Regional Dimension

Radio frequencies extend beyond national borders so spectrum management requires an in-depth knowledge of, and involvement in, European and global spectrum management developments. Much of the radio spectrum is planned internationally and in some cases this constrains how specific frequencies or frequency bands may be used. This is particularly so in the aeronautical and maritime sectors, where, because of the global nature of these services, ships and aircraft must use specific frequencies for navigation and communication purposes. In addition, there are a number of internationally harmonised frequencies for commercial radio systems such as cellular (mobile) phones. The TV and radio broadcast bands have been harmonised for many decades, to facilitate co-ordination between neighbouring countries and the development of consumer markets. Other parts of the spectrum may be used to meet specific national requirements, so long as these comply with the requirements of the ITU Radio Regulations.

The role of each of the international bodies was described in detail in the consultation document. Figure 1 illustrates the International Spectrum Management Framework within which ComReg operates:

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## Strategy for Managing the Radio Spectrum and Specific Services Continued



**Figure 1:** International Framework for Spectrum Management

Within EU Member States, there is a three level regulatory structure governing radio spectrum usage, comprising global, regional (European) and national layers, as indicated in Figure 1 above. Global regulation is primarily the remit of the International Telecommunications Union (ITU), while regional regulatory remits lie with the European Union (EU) and the European Conference of Post and Telecommunications Administrations (CEPT). These bodies define the broad framework within which all spectrum users must operate, and in some cases have developed harmonised approaches to spectrum use in order to facilitate international services, open markets and minimise the risk of interference between users.

In order to ensure the interests of Ireland are protected, ComReg plays an active role at both a global and regional (European) level. ComReg’s proposed strategies within the global and regional frameworks are highlighted below.

### 5.2.2. ComReg Strategy at the Global Framework Level

ComReg's strategy at the Global Framework level includes:

- supporting harmonisation of global spectrum allocations where the harmonisation fits in with Ireland's strategic vision;
- ensuring that Irish interests as a whole are promoted;
- participating actively in key ITU activities in so far as available resources permit to support greater efficiency in its operations;
- supporting the development of relevant international standards;
- taking an active role in the work of international meetings in line with ComReg's legislative mandate, when invited by the Minister to contribute through ComReg's specialist spectrum management expertise.

### 5.2.3. ComReg Strategy at the Regional Framework Level

At the Regional Framework level ComReg's strategy is:

- to work within European frameworks to ensure that the availability of spectrum and regulatory practices are in line with ComReg's objectives, particularly where they bring benefits to consumers in terms of increased choice, more competitive pricing and better quality services;
- to implement, to the maximum extent possible, the CEPT/ECC Table of European Common Frequency Allocations (ECA)<sup>12</sup> in order to support regional harmonisation, noting that implementation of the ECA is currently under review within CEPT;
- where appropriate, to implement ECC Decisions;
- to influence and support the development of harmonised standards;
- to improve co-ordination of frequency assignments with other administrations, through a harmonised European or global approach or by bilateral or multi-lateral agreements, as appropriate.

## 5.3. Public Mobile Services

Mobile communications is one of the fastest growing sectors of telecommunications with mobile phone penetration rates in Ireland now standing at 94%<sup>13</sup>. The three 2G cellular operators licensed in Ireland each have a total of 2 x 21.6 MHz of assigned spectrum, and the three 3G operators each have 2 x 15 MHz. 59% of the available 2G spectrum<sup>14</sup> and 62% of the available 3G spectrum<sup>15</sup> has been licensed.

Ireland is unusual in a European context in that it has large quantities of unused spectrum in the GSM and 3G bands. In the GSM 900 band the 2 x 10 MHz E-GSM spectrum is unassigned as is a further 2 x 3.8 MHz in the core GSM 900 band. Similarly, in the GSM 1800 band there is 2 x 26.4 MHz of spectrum yet to be assigned. In total, Ireland has 2 x 40.2 MHz of available GSM spectrum.

<sup>12</sup> See CEPT ERC Report 25, The European table of frequency allocations and utilisations covering the frequency range 9 kHz to 275 GHz (available at [www.ero.dk](http://www.ero.dk)).

<sup>13</sup> ComReg Quarterly Key Data, March 2005.

<sup>14</sup> Assumed to be 2 x 35 MHz available in the GSM900 band and 2 x 75 MHz in the GSM1800 band

<sup>15</sup> Assumed to be 2 x 60 MHz paired plus 25 MHz unpaired (excludes spectrum identified for self-co-ordinated systems)

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## Strategy for Managing the Radio Spectrum and Specific Services Continued

In June 2005, ComReg invited applications for the fourth 3G licence<sup>16</sup>. The licensee will be offered core 3G spectrum comprising of 2 x 15 MHz of paired spectrum plus 5 MHz of unpaired spectrum, the same as previously offered in the original competition in 2001/2002. In order to achieve a fair level of competition with the incumbent operators, additional spectrum in the 900 MHz and 1800 MHz bands will also be made available, on the basis of demonstrable need, to a successful Applicant who is a new market entrant. This spectrum will comprise up to 2 x 7.2 MHz of spectrum in the 900 MHz band, and up to 2 x 6.0 MHz in the 1800 MHz band.

### 5.3.1. ComReg Strategy for Public Mobile Services

#### 5.3.1.1. Future Expansion Spectrum for 3G Mobile Services

- ComReg is participating in European work on the designation of the 900 and 1800 MHz GSM bands for 3G mobile (work on an ECC Decision is expected to commence in 2005) and will consult with all interested parties on the implications of any proposals.
- ComReg plans to consult with industry to develop a coherent strategy to facilitate the development of 3G services in the 2.6 GHz band subject to market demand whilst accommodating any ongoing requirement by MMDS operators and their customers;
- ComReg is considering the future of the band 2010 – 2025 MHz for other services. Subject to developments in CEPT, ComReg will support the removal of the reference in the relevant ECC Decision, to self provided applications and efforts to achieve a flexible solution for the future use of this band on a harmonised basis subject to market demand.

#### 5.3.1.2. Future Use of Existing Unassigned GSM and 3G Mobile Spectrum

Currently there is unassigned spectrum in the GSM bands (2 x 40.2 MHz) and the 3G Bands (2 x 15 MHz plus 10 MHz). This could change by late 2005 if the fourth 3G licence is taken up.

- ComReg will consider the future of these bands alongside international and wider policy considerations in relation to spectrum liberalisation.
- In particular, ComReg is considering the potential demand for innovative wireless services in these and other frequency bands.

#### 5.3.1.3. Possible Demand for Convergent Wireless Services

- ComReg will endeavour to accommodate requirements for trials of convergent wireless technologies as these arise in appropriate spectrum.

#### 5.3.1.4. Quality of Service

- ComReg will monitor Quality of Service on GSM and 3G networks.

<sup>16</sup> ComReg Doc 05/41 – Licence to provide 3G service in Ireland.

## 5.4. Broadcasting Services

Broadcasting is a major user of the radio frequency spectrum. Radio Telefis Éireann (RTÉ), the public service broadcaster established under the Broadcasting Authority Act 1960 as amended, provides national radio and television services. The Broadcasting Commission of Ireland (BCI), established under the Broadcasting Act, 2001, is responsible for the authorisation of Irish broadcasting services other than those provided by RTÉ, under the Radio and Television Act, 1988 and the 2001 Act. ComReg is responsible for the allocation, assignment and licensing of the associated radio frequencies under the Broadcasting Acts.

### 5.4.1. ComReg Strategy for Television and Sound Broadcasting

- monitor the development of digital modulation techniques that have the potential to replace the analogue service with high quality broadcast services in the short wave, medium wave and long wave broadcast bands;
- ensure present operator compliance and protect authorised services from illegal spectrum use;
- prepare positions for ITU Conference RRC-06: ComReg is working with the DCMNR, RTÉ and the BCI in preparation for the forthcoming 2006 Regional Radio Conference to re-plan the broadcast bands III, IV and V, currently covered by the Stockholm Agreement. The frequency plan(s) to be agreed at the RRC will form the basis for VHF/UHF broadcasting in Europe for possibly the next 20 to 30 years;
- As mentioned in the section under Public Mobile Systems, ComReg is keeping an open mind on the issue of MMDS and IMT-2000/UMTS in the 2500 – 2690 MHz band.

### 5.4.2. ComReg Strategy for the Introduction of Digital Terrestrial Broadcasting in Ireland

- Continue planning and co-ordination in preparation for rollout of DTT. DCMNR has stated that it seeks to facilitate the development of a free-to-air offering of nationally broadcast programming on digital television platforms in the medium term. DCMNR has also stated that the declaration of a specific date as an 'analogue switch-off date' can be a useful means with which to inform citizens about changes in the broadcasting environment and that analogue switch-off will be expected to result in a minimum of inconvenience for viewers.
- ComReg will continue to monitor government policy, market and technology developments in this area and will review spectrum options for DVB and/or DAB based delivery of content to mobile platforms and hand-held devices accordingly.

## 5.5. The Terrestrial Fixed Services

The Terrestrial Fixed Services can be divided up into two main groups:

- Point-to-Point Links;
- Point-to-Multipoint systems.

Point-to-Multipoint systems can be further subdivided into:

- Point-to-Multipoint links;
- Fixed Wireless Access (FWA).

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## Strategy for Managing the Radio Spectrum and Specific Services Continued

Point-to-point terrestrial links (fixed links) provide communications between two fixed stations with a clear line of sight between them separated by distances typically ranging from a few metres up to 50 kilometres. They are used mainly by telecommunications operators, mobile phone operators, broadcasters, utilities and the emergency services to provide transmission networks which are cheaper to build than fibre based networks. They are used extensively in fixed telecommunications networks both to carry trunk traffic and to provide broadband access networks. As a result, fixed links play a vital role in the development of a competitive telecommunications industry in Ireland.

Point to multipoint systems provide communications between a central base station, hub or node and 2 or more outstations. These types of systems can be used in support of backhaul networks or for access. Point-to-multipoint links are used by security companies, for alarm monitoring, utilities and telecommunications operators. Point-to-multipoint systems which are used to provide end-user (residential or business customer) access to a telecommunications network are referred to in Ireland as Fixed Wireless Access (FWA) systems. FWA provides an alternative to wired solutions such as digital subscriber line (DSL) or cable, providing competition to incumbent operators and extending broadband access in 'the last mile' to areas where wired solutions are technically or economically unviable. There are three licensing schemes for FWA in Ireland. In 2000, national licences were issued in the 3.5 GHz and 26 GHz band, local area licences are available in the 3.5 GHz, 10.5 GHz and 26 GHz bands and there is also licence exempt spectrum for FWA in the 5.8 GHz band.

### 5.5.1. ComReg Strategy for Fixed Services

ComReg considers that, in the long term, fibre infrastructure is the most appropriate medium for emerging broadband services, in particular for those networks requiring very high capacity. However, it is recognised that radio links facilitate the early development of infrastructure and competition in the provision of electronic communications services, especially in rural areas. In this regard, ComReg's short to medium term strategy is to encourage the use of fixed links for infrastructure and competition development, for the maximum benefit of all licensees and in particular new market entrants. As networks develop and as congestion in the fixed links bands grow, the strategy will be to encourage migration to fibre based infrastructure.

Strategy for the next 2-5 years:

- ComReg will continue to use document 98/14 (as revised) when licensing point-to-point links.
- ComReg will review the spectrum usage and requirements of licensees to ensure the continued efficient use of spectrum;
- ComReg will encourage operators to use the latest technology such as co-channel dual polar (CCDP) equipment or higher modulation schemes in order to ensure efficient use of the spectrum;
- ComReg will study the introduction of administrative incentive pricing to encourage the use of more bandwidth efficient technologies in congested bands/areas;
- ComReg will review its current licensing strategy to ascertain if there are circumstances where the licensing of a block of spectrum may lead to improved efficiencies and if so, how and in what spectrum, could we facilitate this type of licensing approach;
- ComReg will study sharing implications between Satellite and Fixed services in the 4 GHz band which is currently unused in Ireland. This band could be used for the provision of further national networks;
- Reflecting current market uncertainty over future demand for spectrum in the 4 GHz band, ComReg will consider the options available as part of its liberalisation consultation but defer any firm decision on use of the band until the market situation is clearer;



- ComReg will consult on the use of the 26 GHz band;
- ComReg will study the potential and demand for new fixed links bands at higher frequencies e.g. 58 GHz, with a view to introducing a light licensing regime for these bands;
- It is the intention to clear all remaining links from the old 1.5 GHz band to allow future introduction of TDAB in this band;
- ComReg will review the fixed links frequency bands with a view to rationalising the use of these bands where this makes sense and where the disruption to existing licensees is minimal;
- ComReg will continue the work of the FWALA Operators Forum, the objectives of which include promoting FWA as a viable and reliable alternative platform for the provision of electronic communications services;
- ComReg will continue to identify appropriate spectrum allocations, both licensed and licence-exempt, for wireless access services which are supported, or likely to be supported, by ready availability of choice of equipment;
- Promote the Trial Licence scheme<sup>17</sup> as an ideal opportunity to trial new wireless access technologies such as mobile versions of WiMAX, in Ireland.
- To support the national objective of bringing Irish broadband penetration into line with other EU countries, ComReg will:
  - encourage introduction of new cost-effective wireless technologies;
  - seek opportunities for further licence-exempt FWA services.

## 5.6. Licence Exempt Services

### 5.6.1. Short Range Devices

Among the most prevalent radio systems in Ireland are Short Range Devices (SRDs). These are uni-directional (one-way) and bi-directional (two-way) low power radio transmitters that serve a multitude of purposes e.g. car door openers, sensors, tagging devices, alarms, wireless microphones and wireless local area networks (WLANs). Additionally, SRDs are used for specialised applications such as Road Traffic and Transport Telematics (RTTT) for the management of roads and traffic e.g. automatic road toll collection and traffic information.

SRDs operate in many frequency ranges in the radio spectrum, from kilohertz, through megahertz to gigahertz frequencies. Due to their low power and localised usage, SRDs are regarded as having a low capability of causing interference. Consequently, they have generally been made exempt from the need for individual radio licences in Ireland, subject to certain technical constraints.

#### 5.6.1.1. ComReg Strategy for SRDs

Short range devices are generally exempt from licensing and operate in frequency bands shared with other users and services on a non-interference, non-protected basis. Effectively, this means that they should not cause interference to other legitimate spectrum users, nor can they claim protection from interference from other spectrum users.

<sup>17</sup> See ComReg Document 05/35: Opportunities for Testing and Trialling Wireless Services and Technologies in Ireland – Application Guidance Notes and ComReg Document 04/115: Opportunities for Trialling Wireless Services and Technologies in Ireland

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## Strategy for Managing the Radio Spectrum and Specific Services Continued

### 5.6.2. ComReg Strategy for Licence Exempt Services

- ComReg will facilitate new licence exempt services by making spectrum available wherever possible for such applications, subject to demand and technical feasibility;
- ComReg will continue to exempt services from licensing where this is appropriate in the Irish context;
- ComReg will monitor and contribute to international developments in licence-exempt applications and technologies and, where appropriate, will ensure these can be accommodated in Ireland.

### 5.7. Maritime Services

Due to the global nature of maritime service, the management of the radio spectrum is largely governed by national and international regulations relating to safety of life at sea. The ITU allocates frequency bands for the operation of maritime services and these permit both long range (in frequency bands below 30 MHz and in Bands allocated to marine satellite services) and shorter range communications. In addition, specific frequency channels are allocated as international distress channels and are required to be kept free from interference at all times. There are also a number of bands allocated to marine communications on a national basis.

In Ireland, the Maritime Radio Affairs Unit (MRAU) of the Department of Communications, Marine and Natural Resources is responsible for marine regulation and for ensuring compliance with legislation requiring certain classes of vessels to install a radio<sup>18</sup> which is to be operated by a properly qualified operator.

#### 5.7.1. ComReg Strategy for Maritime Services

- ComReg will continue to provide support to Ireland at international fora to ensure adequate spectrum is available for the maritime services;
- ComReg will continue to prioritise and provide protection from interference to maritime safety of life services;
- ComReg will promote the use of spectrum efficient technologies in the maritime bands, thereby maximising the spectrum available for growth and new applications;
- ComReg will ensure spectrum is available for use by new emerging systems, in line with international requirements;
- ComReg will introduce a licensing regime for radar and radionavigation services. A once-off licence fee of €500 for new stations or modifications to existing stations will be charged to cover co-ordination and notification costs.
- ComReg is planning to review the fees associated with the use of radio on board vessels.

<sup>18</sup> Under the Merchant Shipping (Radio) Rules, 1992, every passenger ship or cargo ship of 300 Gross Tons or above is required to install a radio in compliance with the Global Maritime Distress and Safety System (GMDSS). Similar requirements apply to fishing vessels under the Merchant Shipping Fishing Vessel (Radio Installations) Regulations, 1998.