Commission for
Communications Regulation

Submissions to Consultation

Proposed Strategy for Managing the Radio Spectrum: 2008 – 2010.

Submissions received from respondents

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ComReg 08/20

Date: 2nd May 2008

ALTO response

on

Proposed Strategy for managing the Radio Spectrum: 2008 – 2010

1. ALTO welcomes the publication by ComReg of a Strategy for managing radio spectrum. It is a valuable national asset and makes a significant contribution to economic development. There are significant opportunities to improve this contribution through the upcoming availability of spectrum and the advancement of wireless technology.

2. Ireland as an island and as such has a unique advantage in the allocation of spectrum due to non interference with neighbors.

3. We fully support technology neutral licensing and spectrum harmonization.

4. We have specific comments related to section 4.4: New Spectrum Opportunities

    a. A number of bands are allocated to GSM only and should also include Mobile Data Services which compete with mobile phone providers, thereby providing neutrality.

        i. 925 – 937.8 MHz/ 880 – 892.8 MHz

        ii. 1805 – 1831/1710 – 1736 MHz

        iii. 1915 – 1920 MHz

        iv. 2010 – 2025 MHz

    b. 2300 – 2400 MHz is a known band size and is capable of providing services in the range 10 – 15 MB, and should be released in 2008

02/05/2008

c. 3660 – 3710 MHz and 3760 – 3800 MHZ bands are overdue for release and are required by Operators with no 3.5 GHz spectrum in city areas.

5. Section 7.5 discusses wireless Broadband Services.

   a. It is evident that Ireland is relying heavily on this sector to provide broadband access and is a significant contributor to broadband penetration levels. In particular this sector is important to reduce the digital divide between densely populated and smaller less dense areas.

   b. ComReg is currently auctioning bands in the 26GHz range with a minimum of €350,000 commitment. This commitment is acceptable to larger organizations with established services and scale as it can be justified as a cost reduction or expansion expense. However for market entrants or smaller operators introducing new services the cost is prohibitive. ALTO advocates an innovative approach to this process to encourage new entrants or the development of new services by allocating some sections to be auctioned at a lower minimum of around 33% of the commercial price

c. The table below is an analysis of the prices paid for 26GHz in other countries. This suggests that the price being paid in Ireland for this spectrum is comparatively high and thould thus be re-examined

Country	Band (GHz)	Spectrum (Duplex)	Population (M)	Price / Year	Annual Price / Mhz	...Per population	Year of Auction	Spectrum Left
Ireland	26	28	4.3	35,000	1,250	**290.7**	2008	
Slovakia	26	56	5.4	18,835	336	**62.3**	2007	YES
Austria	26	84	6.4	29,000	345	**53.9**	2007	YES
Norway	26	84	4.7	19,568	233	**49.6**	FCFS Basis	YES
Bulgaria	26	28	7.6	3,060	109	**14.4**	2006	YES
UK	28	224	60.6	22,840	102	**1.7**	2008	NO

Submitted By:

Liam O'Halloran
Chairman - ALTO

2 AREN

Proposed Strategy for Managing the Radio Spectrum: 2008 – 2010

ComReg Document no 08/20 6th March 2008

Response from the Amateur Radio Emergency Network (AREN)

Background

AREN[1] is a public service voluntary radio communications network run under the guidance of the Irish Radio Transmitters Society[2]. It was sanctioned following Ireland's adoption of Resolution 640 (1979) of the Radio Regulation of the International Telecommunication Union (ITU), which provides for the utilisation of Amateur Radio communications in emergency situations. This contribution has since been further recognised, with amendments 25.3 and 25.9A being made to Article 25[3] at the World Radio Communication Conference held in Geneva, in 2003, in order to facilitate the participation in emergency and disaster relief communications of Amateur Radio Stations.

AREN (and indeed the IRTS) is included as non-governmental organisations on the list of telecommunication resources being compiled by ComReg in the context of the Tampere Convention (which Ireland signed the 16th of August 2007)

Section 6.3.6

This section mentions that new legislation relating to the regulation of the electronic communications sector will be introduced. It is hoped that any new legislation will not in any way have a detrimental impact on the capability of radio experimenters to participate fully in public voluntary service communications and, potentially, events of a more critical nature.

It is hoped that there will be a consultative process at the time of the preparation of the legislation and that all interested parties views will be sought on this matter.

Section 7.11

While AREN welcomes the matters set out in this section as items that ComReg indends to finalise during the period of the proposed strategy, we feel that several important items have been overlooked:

- The returning in Region 1 of the 7.1 to 7.2 Mhz frequency segment to an Amateur primary allocation.
- The proposed 3Khz channels in the 5MHz spectrum.
- The general release of the 4m (70Mhz) band.

1 http://www.aren.ie
2 http://www.irts.ie
3 http://life.itu.int/radioclub/rr/art25.htm

We feel that the successful completion of these matters is worthy of a mention as part of ComReg strategy.

There is no mention in any of the text of the “self-training” aspect of the hobby, nor ongoing “technical investigation” whether this be protocol based, propagation based, or any other technical area. It is a commonly held view that these are fundamental tenets on which the hobby is based, and it is acknowledged that many professionals in the area of communications and electronics had some exposure to the hobby before making a final career choice. AREN would be hopeful that this aspect of the hobby could be highlighted in a suitable manner in future ComReg publications.

Annex A

AREN welcomes the development of a network of monitoring stations throughout the country. It is highly likely that more rigorous monitoring of the frequency spectrum will increase the number of reports of unauthorised use of the frequency spectrum. AREN will of course co-operate with ComReg in monitoring, identifying and reporting any unauthorised transmissions or instances of interference.

3 BT

BT Ireland Response to ComReg Consultation

Proposed Strategy for Managing the Radio Spectrum: 2008-2010

Reference: Submission Document No: 08/20

Introduction

BT Ireland welcomes the opportunity to respond to this consultation document which addresses the issue of proposed Strategy for Managing the Radio Spectrum: 2008 – 2010.

Below we detail BT Ireland's comments in relation to the Consultation.

3 General Comments

- Which approach should ComReg take in licensing the various spectrum bands?

BT would generally favour the methodology of a spectrum auction as an approach to issuing spectrum. BT regards auctions as fair, transparent & non-discriminatory vehicles in the apportionment of spectrum.

- Within what timeframe do you consider that ComReg should make various spectrum bands available?

BT believes that all vacant spectrum should be brought to market at the earliest opportunity. BT notes references to workshops and/or consultations proposed to be held by ComReg on spectrum blocks below 4GHz and BT believes these require immediate attention to (as ComReg rightly state) "… support the expected requirement for additional spectrum to facilitate broadband and multimedia services". The superior propagation characteristics of these bands and the global supplier interest in producing innovative technologies at these sub-4GHz frequencies should make this the key focus of ComReg's 2008-2010 spectrum strategy.

- Are there any other spectrum options that ComReg should consider?

With specific regard to the concept of the "Digital Dividend" BT notes and is supportive of the Ofcom stated intention to issue 120MHz of nationwide cleared spectrum next year in the UK. BT Ireland would appreciate greater clarity on ComReg's thinking around the Digital Dividend, specifically the amount of spectrum likely to be issued & in what timeframe. BT Ireland would be eager to participate in this debate and propose that workshops be held by ComReg to explore the relative merits of the options that will become available in Ireland at "Analogue switch-off". BT's learning through involvement in Ofcom's consultations with regard to DDR should prove very valuable in informing the approach that ComReg could consider taking in Ireland.

6.3.6 Legal and Regulatory Environment

- BT notes anticipated delays in changes to primary legislation ("within the next 2 - 5 years") and seeks clarity from the commission as to whether this will see Ireland fall further behind other European member states in areas of spectrum liberalisation and trading.

  BT is concerned that in the absence of punitive “use it or lose it clauses” or indeed the preferred ability to trade spectrum that spectrum hoarding is not being disincentivised in Ireland.

  A full review, by ComReg, of existing under-used spectrum licenses would benefit from an “incentive pricing” approach to make the current licensees reconsider their position with respect to the inefficient retention of a valuable national resource.

7.1 Wireless Platforms for Electronics Communications Services

- BT applauds ComReg's support of the EC's Wireless Platforms for Electronic Communications (WAPECS) initiative which promotes service and technology neutrality.

- Given the EC mandate around technology neutrality in the 2.6GHz (previously reserved for 3G expansion) BT seeks clarity on ComReg's proposal to "hold a consultation with industry to develop a coherent strategy to facilitate the development of 3G services in the 2.6GHz band…" BT believes "WAPECS" a more suitable term than 3G; encompassing the broadest swathe of platforms and services.

- As stated above in our response to ComReg’s General Comments BT believes that fair and timely access to sub-4GHz frequencies will be the catalyst for product and service innovation globally. Ireland cannot afford to be left behind in this regard.

7.5 Wireless Broadband Services

- BT warmly welcomes the proposed ComReg strategy for wireless broadband services (WBS). Most particularly BT Ireland is supportive of the proposal to implement the EC decision on harmonisation of 3.4 - 3.8GHz and the proposal to consult "on the release of additional spectrum in the 3.5GHz band for WBS services."

Conclusion

BT welcomes the publication of the ComReg 08/20 Proposed Draft Strategy document and supports the emphasis ComReg places upon technology and service neutrality. We believe that this approach coupled with a desire to make available all vacant spectrum, as soon as possible, is in the best interest of the Irish economy, the telecoms market and Irish consumers.

4 Michael Higgins EI0CL

Received via ComReg's online response server:

I wish to make a response only in connection with the Experimenter License as follows:

Due to the natural overspill of radio communications by the nature of RF propagation, frequencies that are allowed in neighbouring countries could be broadly harmonised as regardless the spectrum used overspills and is therefore occupying that spectrum in the neighbouring country in any case. Therefore I would ask the Commission to consider allocating the same five 5 MHz spot frequencies that are currently in use by Northern Ireland, UK Amateurs and beyond to Irish Experimenters.

I would ask that the band 1.8 to 2.0 MHz be restored as I see the newer license allocations seem to be 1.810 - 2.0 MHz?

The consideration of a new spectrum allocation around 500 Kcs is very welcome indeed perhaps CW only throughout Europe.

Amateurs in the USA and beyond are allowed higher power levels and increased for full licensees to between 1 and 1.5 Kilowatts on HF bands, there seems to be no good reason to hold those Experimenters wishing to use appropriate higher power for the prevailing conditions down to lesser powers. There are appropriate mechanisms to deal with any interference should this occur in rare cases as a result of higher power being used. I am requesting a power increase on application to 1.5 KW TX power.

Many Experimenters want really want to experiment and to develop new systems including audio techniques, new transmission modes, antennas, improved receivers and much more these days - much of this finds its way into real commercial value. Many heads of our communications companies, consultancies, centres of excellence and education are licensed experimenters who often use their radio experimenter experience to illustrate their ideas and also to share and gain knowledge from other like minded individuals. I believe this is not well recognised and that the whole experimenter idea is being relegated to amateur or hobby status -I would respectfully request that the experimenter status remain and that the use of the word amateur be deleted from all matters relating to experimenter except where it must be used i.e. in cases of the HAREC harmonisation of services. Otherwise I believe the Experimenter service will degenerate in the long term in Ireland, losing experienced communications experts, to the service, losing valuable expertise and the sharing of this expertise, in an easy friendly way

which is also educational to others and at very very little cost to the state because experimenters fund their own studies, equipment and operating costs themselves. Socially of course there are benefits as many living in the rural areas , living alone find the interest rewarding in that it occupies a lot of their spare time in a very positive way. Internationally the Irish Experimenter is in great demand; radio crosses many frontiers in a friendly generally positive way with benefits that are broad and far reaching - again positive for the nation

Respectfully

Michael Higgins EI0 CL

5 Craig Wireless Systems

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Miss Sinead Devey,
Commission for Communication Regulation
Irish Life Centre,
Abbey Street
Dublin 1.

26th April 2008.

Re; **Response to Consultation 08/20**; **Proposed Strategy for managing Radio Spectrum 2008-2010.**

Dear Sir,

I refer to the above consultation paper and am delighted to have an opportunity to respond on behalf of Craig Wireless Systems (CWS), a global telecommunications company listed on the Toronto Stock Exchange. With spectrum assets and operations in Canada, the United States, Greece, Norway, New Zealand, CWS has extensive knowledge of the management and usage of national spectrum assets in different countries and continents. In responding to this document, we at Craig Wireless want to make clear our aspiration to add Ireland to our operational portfolio in the near future.

Overview.

In an overall assessment of European markets, Ireland presents itself as both an attractive yet challenging opportunity for efficient and profitable spectrum usage. CWS concur with the statement made in 4.2 of the paper that Irelands' geographical position on the western edge of Europe, with low population density and a below average broadband penetration bestows an initial appeal to the market .However when one considers that Ireland currently suffers

1. the highest fixed line rental in the EU /World

2. the highest mobile phone charges in the EU

3. Second lowest broadband penetration in the EU.

a very different view of the Irish market place is garnered. When these headlines are combined with the fact that Ireland now has the most expensive energy charges in the EU , the countries competitive edge and attractiveness as a place in which to invest is significantly undermined . CWS commends Comreg as a regulator for these issues and for presenting in this document a transparent and informed view at to how to maintain an open spectrum management policy yet continue to drive a competitive market place. In particular we agree that Ireland as an island with little transnational interference is an ideal location for the "trial and test" initiative and

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encourage Comreg to continue to pursue this innovative initiative.

Specific responses to Section 3.

Q. ***Which approach should Comreg take in licensing the various spectrum bands?***

As previously stated in this document, CWS believe Ireland presents a number of unique challenges to prospective spectrum users, service providers and investors. The unusual high level of cost involved in the set up (access to infrastructure) and operation (customer care, etc) of a wireless service is the first hurdle that new entrants and existing service providers must consider. Such hurdles coupled with expensive spectrum would in most cases render a business case unviable due to the current competitive demographic that exists in the country and that is manifest in its high telecommunication pricing.

As a prospective new entrant CWS encourage Comreg to award spectrum to those companies who have clearly demonstrated both innovation and commitment to utilising spectrum in an efficient and progressive manner on the world stage and whose expertise and presence in Ireland would facilitate and promote further competition in the Irish marketplace thus enhancing the user experience of the Irish telecom consumer .Accordingly we do not believe that the use of auctions will best serve the Irish telecommunication user as history manifests that in other markets where operators believe that they have overpaid for spectrum, costs are ultimately transferred to the end user and spectrum remains unused as operators become cash-strapped as a result of auction outlays. In the relatively small Irish telecoms market this scenario could be catastrophic for the development of the country's competitiveness and as an investment location.

Q ***Within what time frame do you consider that Comreg make various spectrum bands available***.

CWS believe that Comreg must move immediately to FULLY adopt the WAPECS initiative to ensure it's policies align with those of its European partners and is in accordance with the recent decrees with regard the 2600ghz band which has been set aside for IMT2000 and which has also been legitimised for Wimax usage. CWS, with it origins in broadcast and cable television industries submit that that the allocation of this spectrum to MMDS is at variance with the stated Comreg mantra/objective of striving to ensure the "effective and efficient use of spectrum" for the following three reasons.

1. UPC (Chorus/NTL), as holders of the spectrum, has less than 12% of their customer's base using the MMDS service.

2. MMDS cannot be regarded as efficient use of this spectrum band due to the signalling configuration.

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3. The MMDS service offered by UPC is highly regionalised and spotty in Ireland (Waterford, part of Galway, North Dublin) leaving vast swathes of the 2.6 GHz band currently unused.

Without immediate reallocation of this spectrum to the proclaimed "technology neutral stance of IMT 2000, Ireland runs the risk of falling further behind the rest of Europe which recently has seen the 2.6GHz band awarded in Norway and Sweden and the upcoming Ofcom award of this spectrum band in the UK?

Further reasons to expedite such a move

- As Ireland still lags behind in the EU broadband penetration league, the introduction and advancement of new bandwidth intensive technologies such as Wimax should be embraced .As the first chipsets in laptops will configure to the 2.6GH z band, it is critical that spectrum is allocated to drive the delivery of networks to accommodate such technologies that in turn will assist Ireland deliver on its much vaunted "digital future".

- Our closest telecom market , the United Kingdom , regulated by Ofcom have reassigned the 2.6GHz spectrum band to "technology neutral" status and will award this band to prospective users in September 2008 .As Comreg has stated in this consultation paper its desire to work on an All Island license strategy it is essential for both the economies of the Republic and Northern Ireland that these bands have a similar status thus facilitating more cost efficient economies for future All Island service providers.

CWS therefore respectfully requests Comreg to act immediately to ensure this valuable band is reallocated to a technology neutral status, relocating the current MMDS operation to a new band (possibly the 1452 MHz-1492 MHz band which is available), thus enabling new technologies such as Wimax/LTE deliver the wireless bandwidth intensity and quality of service that to date Ireland has been missing.

Q.***Are there any other spectrum options that Comreg should consider***?

CWS believe there are options that Comreg should consider.

With regard the well worn and contentious issue of the refarming of GSM spectrum, CWS is strongly in favour of this proposed refarming of spectrum as it will bring about a more efficient use of the national assets at 900 MHz and 1800 MHz. However as the technologies which can be refarmed into this spectrum offer a significantly more advanced set of service that those for which the spectrum was initially licensed, provision must be made to allow new entrants to the market to challenge for new licenses in these bands. This should obviously occur before the existing operators begin this refarming activity and would to some extent help to counter-balance the lack of competition that can often exist in markets such as Ireland where there is a

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fixed amount of spectrum. Refarming is definitely the right thing for Ireland, but only in circumstances where it does not further entrench uncompetitive practices in the market which to date has supported the high levels of pricing for mobile services in Ireland.

CWS would also support Comregs intention to allow the 2300GHz –2400GHz be promoted as a wireless broadband band supporting full mobility.

In conclusion CWS would once again like to state its gratitude to Comreg for the opportunity to provide feedback on Irelands future spectrum management policy.

Yours sincerely

T Boyd Craig.

Chief Executive Officer
Craig Wireless Systems

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7 April 2008

Ms. Sinead Devey
Commission for Communications Regulation
Irish Life Centre
Abbey Street
Freepost
Dublin 1

Reference: Submission re ComReg 08/20

Dear Ms. Devey:

This letter constitutes eircom's response to ComReg's draft *Proposed Strategy for Managing the Radio Spectrum: 2008-2010*, upon which we welcome the opportunity to comment.

While eircom supports the high level goals detailed in the document, eircom calls upon ComReg to move quickly to defined timelines for the consultation on and possible release of frequency bands of strong interest to the industry, in particular:

- 'digital dividend';
- interleave UHF spectrum;
- "GSM bands, or 925-937.8 MHz paired with 880-892.8 MHz;
- spectrum under 4 GHz.

Potential innovative commercial services using these spectrum bands are unlikely to be introduced in Ireland, if they are subject to prolonged regulatory uncertainty.

'Digital dividend'

The valuable spectrum, which eventually – but belatedly in the case of Ireland -- will be released as a result of the eventual switchover from analogue to digital terrestrial television (DTT), offers a key opportunity to respond to increased demand for spectrum and bridge the 'digital divide' by boosting mobile broadband, for instance in rural areas. eircom favours the opening of the UHF band freed up as a result of the switchover to broadband wireless services and welcomes a common European Union (EU) approach to the 'digital dividend.'[i]

eircom believes that a spectrum sub-band for bi-directional broadband wireless access networks should be co-ordinated at EU level, as proposed by the European Commission. A non-mandatory approach, providing flexibility in the implementation of such plan within Europe, could pave the way for further progress of EU harmonisation of spectrum usage. With such an approach, broadcasting -- as well as telecommunication services -- will take advantage of the progress of digitalisation for the benefit of Irish and European citizens and the competitiveness of Europe.

Developments in the United States are instructive in respect to the need for timely policy-making. In a April 4th press conference[ii], Verizon Wireless CEO, Lowell McAdam, said, "*There is a title wave of innovation that is waiting to come over to the mobile platforms*," in relation to broadband capability being increased on the wireless networks. Referring then to Verizon Wireless' plans to launch its Long Term Evolution (LTE) network in the 700 MHz spectrum, McAdam said, "*We'll be finalizing standards and beginning field trials in 2008. In 2009, we'll be selecting vendors and doing advanced device trials. In 2010, we'll launch the network commercially and have a rapid acceleration of the footprint to get to full deployment. We feel it's important to move aggressively.* "

Interleave UHF spectrum

The development of the Digital Video Broadcasting-Terrestrial (DVB-T) and -Handheld (DVB-H) standard makes it possible to deliver real-time broadcast television to fixed devices and mobile handsets. ComReg thus should allow and encourage the use of DVB and DVB-H in its spectrum management policy.

Given the flexibility and potential of this technology standard, it should be not be given 'second class status' in ComReg's spectrum management strategy. Licensing for DVB should not be 'hostage to the future' to the rollout of DTT in the UHF band. Provision must be made for national DVB/DVB-H facilities, supported by appropriate licences, as soon as possible.

GSM bands

eircom notes ComReg's intention to conduct a public consultation on the 900 MHz and 1800 MHz bands during 2008 in order to make an informed decision about future licensing.

Liberalisation of spectrum use brings with it huge opportunities for Irish operators, allowing technology that best delivers services to be deployed within bands hitherto reserved for GSM technology. eircom wishes to draw ComReg's attention to the recent decision by the French national regulatory authority, ARCEP, to allow for re-use of 900 MHz frequencies for 3G services, setting what could be precedent for the re-deployment of 900 MHz in Europe, and the recent consultation by UK Office of Communications (Ofcom) on the application of spectrum liberalisation and trading to the mobile sector.

Spectrum under 4 GHz

Given the possible future uses for this spectrum, including next-generation mobile applications, wireless broadband and further terrestrial applications, eircom calls for the timely release of this spectrum.

Reservation of Spectrum for National Broadband Scheme

As indicated in our response submission regarding ComReg 07/42, *Response to Notice of Intention - Reservation of Spectrum for the National Broadband Scheme (NBS)*, issued on 20 July 2007 eircom strongly supports the NBS and is pleased to be among the enterprises short-listed in the competitive tender. It was thus with great concern when we read the "Response to Notice of Intention", which effectively precludes eircom from availing of the spectrum being reserved for the eventual awardee of the NBS tender. Under this Decision, which reserves spectrum for licensing under the existing FWALA scheme -- and the channel J exclusively for use under NBS, the National FWPMA licensee, eircom, is excluded from availing of the considerable amount of spectrum reserved for the NBS. The tying of the reserved spectrum, with the potential for an 'upgrade path'[iii] not possible under the FWPMA license, to the FWALA scheme brings into question whether the NBS competitive tender will truly be competitive.

eircom-held FWPMA licence

eircom is currently using its FWPMA licence mostly to provide narrowband voice services via fixed wireless access, i.e., as 'in fill' where fixed-line access is not commercial or technically infeasible. In late-2007, we also began WiMAX-enabling base stations within our fixed wireless access network in preparation for the launch of additional services.

Given the importance of the license to its multi-modal access network strategy, eircom will seek the eventual renewal of this license.

* * *

We thank you in advance for taking these comments into consideration.

Sincerely,

_____
Victoria Gerus
Head of Regulatory Strategy

[i] European Commission, "Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: Reaping the full benefits of the digital dividend in Europe: A common approach to the use of the spectrum released by the digital switchover," COM(2007)yyy, 13 November 2007.
[ii] "Verizon Announces Plans for New Spectrum," Wi-Fi Planet, 4 April 2008.
[iii] For example, services being upgraded from 1Mbit/s to 8Mbit/s, while maintaining the required contention ratio.

7 ESB Telecoms

Dear Ms. Devey,

Reference: Submission re: ComReg 08/20

Response to ComReg's "**Proposed Strategy for Managing the Radio Spectrum: 2008 – 2010"**

ESB welcomes the invitation to comment on ComReg's Radio Spectrum strategy.

ComReg's Proposed Strategy document mentions a number of uses for the radio spectrum that are of national strategic importance.

In the context of section 6.3 "SPECTRUM MANAGEMENT STRATEGY DRIVERS" ESB wishes to present the following information.

ESB (as part of an initiative sponsored by CER and the department of Communications Energy and Natural Resources) is planning to implement an Advanced Meter Infrastructure (AMI) which is part of the national strategy for a sustainable energy future.

This infrastructure may use a large number of short-range devices to provide two way communications at electricity meters and also possibly for in-home communications with a customer display and other utility meters.

Daragh Moore
ESB

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8 Google

Response to ComReg Consultation 'Strategy for Managing the Radio Spectrum (2008-2010)'

Introduction

We welcome the opportunity to participate in this important debate in Ireland.

The consultation from ComReg is very timely in a broader EU and global perspective. 2008 is already a year of significant spectrum management activity, in terms of both licensed and unlicensed usage. For licensed uses, the FCC has kicked off the year with a significant auction of digital dividend spectrum. A large number of auctions of bands crucial for wireless broadband and mobile services will take place this year. 2008 will also be a crucial year for policy change in the EU with the EU Commission driving a Europe-wide debate and co-ordination effort on digital dividend issues. A number of major developments are also expected in the unlicensed spectrum arena, with key decisions expected in both the US and the UK on use of TV white spaces.

In this paper we will outline Google's overall perspective on spectrum issues and focus on a number of key policy issues – the opportunity of the 'Digital Dividend', consideration of spectrum held by government, and promoting innovation through unlicensed use of spectrum.

Google's Perspective on Spectrum

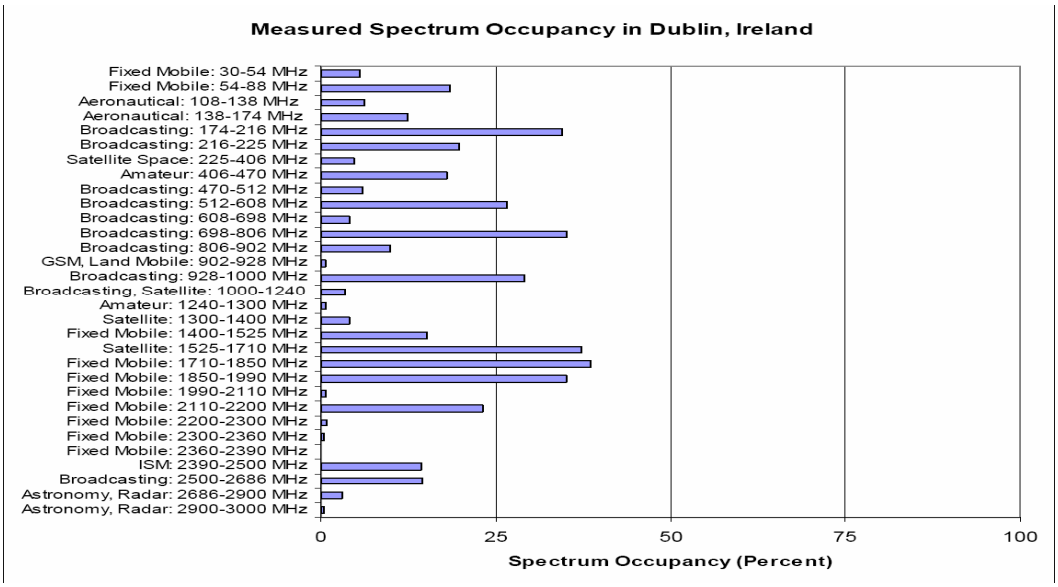
Google's mission is to organize the world's information and make it universally accessible and useful. In seeking to achieve this mission our focus is on web search and related information and communications services. As vital enablers, particularly in making information accessible, we support unfettered access to the internet, growth in the numbers of internet users worldwide, and the greater deployment of broadband services.

Throughout the world, users are adopting mobile and wireless services as a means of accessing information and communications services. Figures from the EU Commission's 2007 Implementation Report show that, in the European

Union, mobile penetration reached over 111% in 2007, with over 550m subscriptions. Interestingly, 2007 also saw significant growth in 3G mobile services, with 88m subscribers by year end. Ireland's mobile penetration is over 115%, with a significant uptake in mobile broadband services.

Our view is that this momentum will continue to grow and wireless services will be a very significant contributor to delivering the future promise of the information age. We believe it is vital that all stakeholders (governmental, industry, and users) acknowledge this potential and seek to maximise the opportunities for innovation in spectrum.

There is much evidence to suggest that significant quantities of spectrum remain un-used or under-used – this presents a significant opportunity to policy makers and industry. As an example of under-utilisation of spectrum, a technical assessment carried out (by the Shared Spectrum Company) last year for ComReg found that average spectrum usage/occupancy during a high usage period in a normal work week in Dublin was only 13.6%. The table below illustrates the findings from this study. The findings are similar to data obtained for cities across the USA, including studies on Chicago and New York.[1]



We also believe that significant potential for supporting the development of new services exists in the re-allocation of spectrum from traditional uses, particularly as technology develops, and in a greater use of unlicensed spectrum.

1 Spectrum Occupancy Measurements (April 2007) at
http://www.sharedspectrum.com/measurements/download/Ireland_Spectrum_Occupancy_Measurements_v2.pdf

Finally, we believe that the development of the internet provides some significant insights for how spectrum use could evolve in the longer term. The internet is built on a collection of principles - driven by collaboration between users, utilising diverse technologies and services, without a significant level of regulation. Our view is that these 'openness principles' could make a significant contribution to the future evolution of spectrum policy.

Principles for Spectrum Allocation

The traditional model of spectrum allocation has been a "command and control" approach where key aspects of the allocation of spectrum usage rights are controlled, including exactly which frequencies can be used, for precisely what purpose, and with what technologies. We welcome the moves by ComReg and other European NRAs in recent years to allocate spectrum in a more rapid and transparent manner via auctions – based on principles of technology and service neutrality. Our view is that, where spectrum is to be allocated and licensed, auctions represent the best approach.

Secondary markets in spectrum help to promote efficient allocation, assignment and use of spectrum. While there are relatively few spectrum trading regimes in operation worldwide there is a growing consensus amongst policy makers that this represents a pragmatic and imaginative way forward. We welcome ComReg's positive assessment of the potential of spectrum trading and we urge that consideration be given to the necessary enabling measures to allow such a system come into operation in Ireland.

Google has, in communications with the FCC, outlined some ideas around the potential of using innovative market allocation mechanisms to ensure a more efficient allocation/use of spectrum. We have proposed that policy eventually should allow any spectrum that is unused at a particular place and time to be eligible for secondary uses. This could be achieved through dynamic auction mechanisms. As one example, licensees could institute a dynamic auction mechanism, where a designated entity would provide access to spectrum on an as-needed basis. Payments would be made in perpetuity as the spectrum is being used, rather than months or even years in advance. Such a dynamic auction would facilitate infrastructure build-outs, remove barriers to entry for smaller and more innovative entities, and leave additional money in the private sector to build out infrastructure.

The Opportunity of the 'Digital Dividend'

The digital dividend presents a wholly unique opportunity for Ireland, and indeed Europe, to adopt public polices that promote the efficient and innovative use of our scarce spectrum resources to bring ubiquitous wireless broadband internet access to all.

This is an opportunity to accelerate the penetration and uptake of broadband services for consumers, and bridge the so-called “digital divide” that continues to separate far too many people from the technological tools critical to economic, social, and personal advancement.

The re-allocation of spectrum from traditional uses to new internet-based services is imperative in light of developments in technology and significant changes in how people access information and communicate. We have seen, in recent years, users moving away from traditional media (e.g. TV and radio) towards online services. We have also seen dramatic increases in time spent online - with usage patterns moving from information gathering towards a much wider set of online interactions, where entertainment and community engagement become more and more important.

The spectrum to be released by the switch-off of analogue TV is without doubt very valuable. The recent auction of equivalent spectrum (700MHz) in the US raised over $19.5bn. The European Commission has pointed out (in its 2007 Communication) that “the digital dividend should exceed the spectrum currently available for GSM systems in most [EU] Member States.”

Determining how the digital dividend spectrum is to be allocated obviously raises many issues for policy makers. An example which is worth considering is the UK. Ofcom published a statement in late 2007 setting out its proposed approach [2]:

- Releasing a significant portion (over 30%) of the current analogue TV spectrum for new services
- The cleared spectrum to be allocated via an auction
- The spectrum to be allocated in a technology-neutral manner – packaged in a way that enables the widest possible range of uses. This approach aims to give all potential users the same opportunity to acquire spectrum rights and roll-out new networks and services.
- The auction is targeted to be completed in the first half of 2009

In Ireland the Government has committed to completing the roll-out of DTT well in advance of 2012. Our view is that policy makers should move to establish a clear timetable for the final switch-off of analogue TV services and address how and when the freed-up spectrum will be allocated. Harmonisation with other EU countries should be a priority in developing such policies. Drawing on experience from other countries, such as the UK and the USA, we believe that a significant proportion of the digital dividend spectrum should be reserved for allocation in a technology and service neutral manner.

2 Ofcom ‘Digital Dividend Review’ (Dec 2007) at http://www.ofcom.org.uk/consult/condocs/ddr/statement/

Unlicensed Spectrum

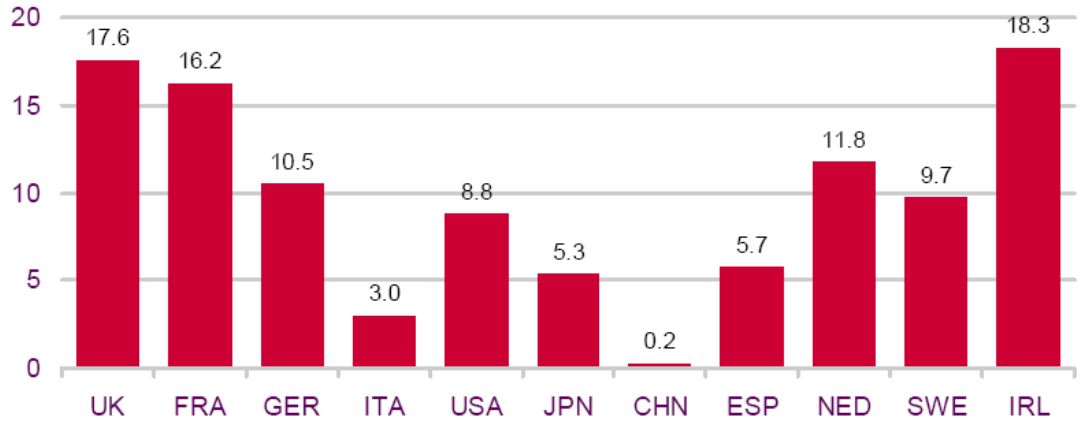
Licence-exempt usage allows access to spectrum by all users (open access spectrum) or to a group of users who hold the rights to that spectrum in common ('spectrum commons'). Users comply with established technical "etiquettes" or standards that set power limits and other criteria for operation of unlicensed devices in order to contain interference.

Google's overall view is that licence exemption should be encouraged and policy makers should establish a commitment to move towards a growing proportion of spectrum for licence-exempt uses.

Unlicensed uses of spectrum have a track record of facilitating innovation. The prime example is Wi-Fi.

The success of wireless hotspots in Ireland is significant. Data from the 2006 Ofcom report on the International Communications Market [3] showed that Ireland was amongst the world leaders in this sector. The figure below shows Ireland's substantial penetration of hotspots in comparison with a number of leading global economies.

Figure 2.11: Public wireless hotspots per 100,000 population, Q1 2006



A number of other services, such as ultra-wide band and bluetooth as well as domestic uses have also demonstrated the practicality and usefulness of unlicensed usage of spectrum.

In the context of the switch-off of analogue TV services, a policy debate has emerged in a number of countries focusing on the potential use of unlicensed spectrum in TV bands (known as "white spaces"). This segment of spectrum

3 Ofcom (Nov 2006), The International Communications Market at http://www.ofcom.org.uk/research/cm/icmr06/

holds great promise for building and deploying fixed and mobile low-power devices for a variety of potential uses, including serving as new broadband platforms. In particular, the favourable propagation characteristics of these spectrum bands facilitate building networks that can transmit signals over long-range distances and more easily penetrate obstacles.

In the US, the FCC has initiated a programme to establish technical parameters designed to ensure no interference from unlicensed devices with licensed users. Google strongly supports this initiative by the FCC.

The UK has emerged as having one of the most innovative approaches on unlicensed spectrum. Ofcom's 2005 Spectrum Framework Review [4] described unlicensed spectrum as "a key area for innovation and growth". Ofcom estimated that, in 2000, some 4% of spectrum operated as unlicensed. By 2010 Ofcom intended to increase this usage to 7%. Ofcom has kicked off a programme of modelling and testing with a view to further consultations and policy decisions later in 2008.

We urge ComReg to make an overall policy statement concerning the development and use of devices in licence exempt spectrum and the allocation of a proportion of spectrum assets to unlicensed use. As part of the consideration of the digital dividend, we urge ComReg to bring forward proposals for the use of unlicensed services in TV white spaces.

Government Holdings

Many governments worldwide maintain significant holdings of spectrum. Among the primary users are military and defence ministries. These spectrum assets represent a major resource, which in many cases is under-utilised. There is a recurring theme with government holdings around a lack of transparency as to what spectrum is held and what it is used for. Fortunately, some countries have embraced a more progressive approach.

A 2005 study for the UK Treasury [5] found that "the market value for current public sector spectrum holdings could be between £3bn and over £20bn."

Ofcom has recently completed a review of spectrum use for the entire UK public sector [6]. Ofcom estimates that public sector spectrum holdings amount to nearly half of the total spectrum below 15 GHz. Ofcom intends to introduce market mechanisms for spectrum held by public sector bodies.

The Netherlands has introduced a 'justification' process, under which government agencies have to account to the Ministry of Economic Affairs for their use of spectrum. This process, which is repeated on a regular basis, has resulted in

4 Ofcom Spectrum Framework Review (2005) at http://www.ofcom.org.uk/consult/condocs/sfr/sfr/
5 'Independent Audit of Spectrum Holdings' by Martin Cave (December 2005) at http://www.spectrumaudit.org.uk/pdf/caveaudit.pdf
6 Spectrum Framework Review (January 2008) at http://www.ofcom.org.uk/consult/condocs/sfrps/statement/

greater transparency and a growing awareness within government agencies of the efficiency of their usage and the value of their spectrum holdings.

In Sweden the telecomms regulator, the National Post and Telecom Agency (PTS), was asked by the government to report on the extent to which the efficiency of frequency use differs between licence holders paying charges for their licences and radio users not paying charges. The PTS made a comparison between the frequency use of the Swedish Armed Forces and frequency use where the users pay charges for their licences. The PTS (October 2007) report found that [7]:

- In peacetime, the Swedish Armed Forces has an exclusive right to utilise more than 16% per cent of key frequencies
- Some of the Swedish Armed Forces' frequencies are mainly used during certain times and at particular locations – which was not seen to represent efficient utilisation of resources.
- The Swedish Armed Forces' overall use of frequencies could become more efficient through re-planning and a higher level of sharing between civilian and military users. Purchasing new digital equipment would also for more efficient usage of spectrum.

We accept the importance of security and public safety usage of spectrum. We urge ComReg to consider a review of spectrum usage by public bodies to establish the opportunities that may be available for release of spectrum, for example as security and emergency services move to digital technology. ComReg should also consider policy measures which could incentivise public bodies to release quantities of spectrum held.

ENDS

7 Report on the extent to which the efficiency of frequency use differs between licence holders – PTS (Oct 2007) http://www.pts.se/en-gb/Documents/Reports/Radio/2007/PTS-ER-200724/

9 HEAnet

HEAnet Response to ComReg 08/20 "Proposed Strategy for Managing the Radio Spectrum:2008 – 2010"

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Table of Contents

1 Introduction

HEAnet Limited is Ireland's National Education and Research Network, providing Internet services for more than 40 subscriber institutions and over 150,000 staff and students in Ireland's Universities, Institutes of Technology and other educational and research organisations, as well as almost 4,000 primary and second level schools.

HEAnet Limited is a closed community group, catering for the broadband requirements of publicly funded Education and Research organisations in Ireland only. It has been in operation since 1983, and was formally registered as a not-for-profit company in 1997, with a memorandum and articles of association which clearly bounded the membership and remit of HEAnet.

In November 2007, the HEAnet board directed HEAnet to develop a wireless strategy for HEAnet client higher education and research institutions. As part of this process, Ward Solutions were selected to undertake a study of possible future wireless services. This study has now been completed and several new services and technologies have been identified. One of these new services is the development of WiMAX technology to extend and complement the current campus Wifi networks at Higher Education Institutions (HEI). In order to provide a reliable high quality production WiMAX services at HEI Institutions, access to licensed spectrum is required. It is on this basis that that HEAnet is responding to your strategy document for managing the radio spectrum: 2008-2010.

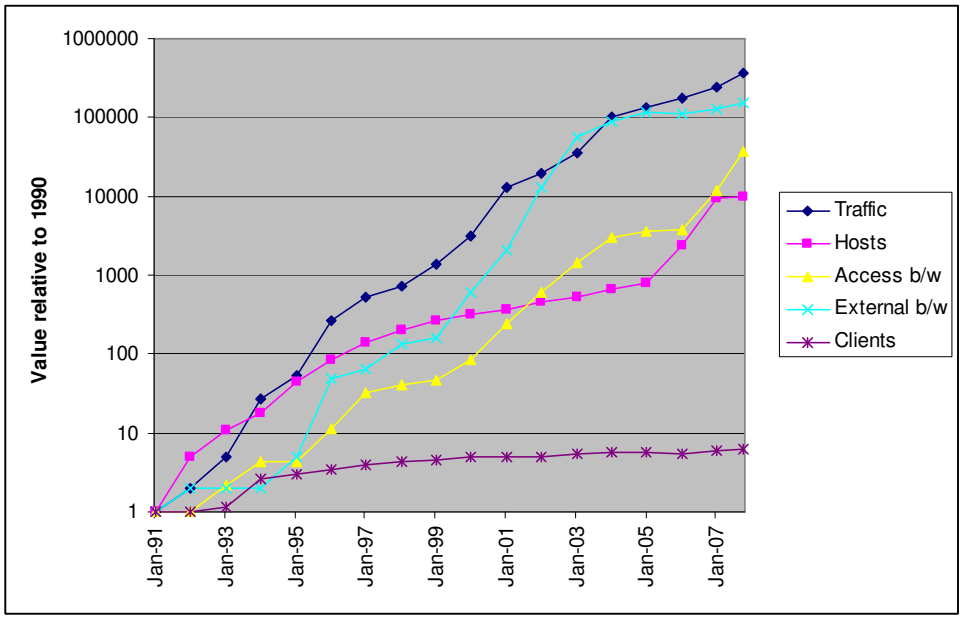
The executive summary of the HEAnet Wireless Strategy is included in Appendix 1.

2 Demand for wireless broadband services

There is an ever increasing demand for wireless broadband services both on and off campus by students and staff in the Higher Education sector. This demand is driven by a number of factors including:

- A steady increase in laptop computer ownership and usage.
    - Over 70% of students in UCD have laptops, with over 900 Wifi access points in UCD, and 13,000 unique wireless devices connecting weekly.
    - Trinity College Dublin has over 4,000 wireless devices connecting daily and over 600 Wifi access points.
- The increased adoption of other mobile data devices including PDAs and data enabled phones.
- The facilitation of wireless data access both on-campus through the implementation and rollout of Wireless LAN and the rollout of higher bandwidth mobile technologies by commercial operators
- The increase in usage of portal access for e-learning, email and other services offered by Higher Education Institutes.

- Increased expectations and demand for anywhere anytime access to campus network resources and services.
- The HEAnet client base consists of over 150,000 third level staff and students along with approximately 800,000 staff and students at primary and secondary schools.
- HEAnet has seen a doubling of Internet traffic on our network every year since 1991. This is illustrated in the graph below in blue. Also illustrated is the number of devices (pink) connecting to the HEAnet network. The large increase in the number of hosts in 2005 - 2006 was due to the connection of the primary and secondary schools to the HEAnet network. HEAnet expects this yearly doubling of Internet traffic to continue into the future and wireless broadband is expected to become a significant portion of this growth in the near future.



The Higher Education sector recognises the growing requirements of both students and staff for mobile data access and access to the internet and campus network resources. In order to meet this growing demand (40% growth in wireless devices in 12 months in UCD), new technologies and services are required. Student uptake is at a very high level as well; figures from major universities indicate that over 80% access course management and e-learning systems at least weekly, while 90% use e-mail weekly.

In addition to the Internet traffic growth from the Higher Education sector, HEAnet has seen continued growth in Internet traffic from primary and secondary schools. Usage of the Schools Network has been rising consistently and significantly since its inception in 2005. As at April, 2008:

- An estimated average of 3,500 schools connect to the Schools Network on a daily basis (up from 2,800 schools a year ago)
- Schools are regularly downloading in excess of 500 gigabytes of data per day (up from 300 gigabytes a year ago)

- Schools network traffic is reaching approx. 275Mbps daily (up from 175Mbps a year ago)

It is anticipated that additional improvements in WLAN infrastructure in the schools either via Wifi/WiMAX or both will further support the growth already seen in traffic from schools.

3 Existing HEAnet WiMAX trials

In order to facilitate the growing demand for wireless services, Higher Education Institutions with HEAnet are currently investigating the next generation of on-campus and near-campus wireless solutions for students and staff. Currently HEAnet is involved in two ongoing mobile WiMAX trials at NUI Maynooth and Trinity College Dublin, using trial licenses obtained from ComReg. The purpose of these trials is to:

- Evaluate WiMAX technology for on and near campus services.
- Investigate the best scenarios for integrating WiMAX with existing Wifi networks
- Research into WiMAX technology by both masters and PHD students
- Building relationships with industry, Intel, Alvarion, Alcatel-Lucent.
- Trial new educational services and applications for students
- Trial suitability for providing services to 1st and 2nd level schools in close proximity to HEI campuses.
- Trial of identity management systems

As can be see from the letters of support from TCD and NUIM , both of these universities would like to provide production services over these new networks on completion of their current trials.

4 Deployment model and proposed use of spectrum

While both Wifi and WiMAX both provide wireless broadband access, Wifi has been developed to provide wireless LAN connectivity while WiMAX has been developed to provide Wireless MAN connectivity. By combining both of these technologies HEAnet aims to extend network coverage from individual buildings to the entire campus.

Intel have released an information card for their new Wifi/WiMAX combo card[1] which will be released in Q3 2008. The integration of Wifi and WiMAX cards by Intel into everyday laptops will enable users to connect to the in building Wifi or the campus wide WiMAX network while staying connected to the network.

[1] http://www.intel.com/technology/wimax/

If access to spectrum was made available from ComReg, HEAnet would use this spectrum in cooperation with Higher Education Institutions to build complementary WiMAX networks at HEI campuses.

This model for building and operating the network enables HEAnet to control the technology platform and the services provided. Having direct control over the option of equipment and therefore services allows HEAnet to control the quality of services and to enable new services such as IPv6/Multicast/IPTV long before commercial operators could provide such services. In addition it allows HEAnet to change or upgrade technology and services rapidly to stay at the forefront of technology advances.

Along with providing services to staff and students, HEAnet also provides services directly to researchers for access to new network technologies and services. Having access to licensed spectrum for third level use would enable HEAnet to provide long term use of spectrum to researchers and direct access to network equipment to researchers when required for trialling new technologies and services in Ireland. This would be of great benefit to the R&D community in Ireland, while also providing an advantage over other locations world wide.

5 HEAnet spectrum requirements

In order to implement the HEAnet wireless strategy as agreed by the HEAnet Board on the 3rd April 2008, access to licensed spectrum is required.

HEAnet's preference is for an allocation of 30 MHz licensed spectrum at a WiMAX frequency for use nationally. HEAnet would manage this license exclusive for use by HEAnet clients only.

Possible suitable frequency ranges are 2.3-2.7GHz and 3.3-3.8GHz.

HEAnet's order of preference would be for access at 2.5, 3.5, or 2.3GHz.

HEAnet is seeking access to 30MHz of spectrum. A 30 MHz spectrum allocation would allow the deployment of a cellular structure for wireless WiMAX. For a cellular structure, we need to be able to designate multiple small blocks of spectrum to a cell which can be then be reused elsewhere. For WiMAX and other standards, a minimum useful block would be 5 MHz, which would allow a spectrum reuse ratio of 5 once guard bands are considered. The importance of being able to deploy a cellular structure as opposed to a single base station site cannot be overestimated from two perspectives: student services and research. From the perspective of student services provision, a network must be able to support several thousands and even tens of thousands of potential users (for example at UCD or TCD). From a network design perspective this will mean that a network deployment will be capacity constrained, ie base stations will be overwhelmed with users unless cell sizes are kept small.
The solution is to use a cellular structure which implements spatial multiplexing and allows for efficient use of the spectrum and support large numbers of users.

From a research perspective, some of the most interesting problems come from the interaction between cells and the network issues in managing the handover between cells, the design of the cells and subsequent management. These issues are hard to simulate and an experimental basis would be invaluable. Hence 30MHz of bandwidth would be our preferred bandwidth.

If access to spectrum was granted by ComReg to HEAnet in early 2009, HEAnet would start rolling out WiMAX infrastructure in Higher Education Institutions by mid 2009.

6 Conclusion

HEAnet's role in developing a wireless infrastructure for the HEI sector is part of a service development programme which has been discussed with HEAnet clients and has been signed off by the HEAnet Board. There is support for this role in the NDP 2007-2013, where HEAnet is explicitly referenced for the development of national infrastructure.

HEAnet's preference would be for 30MHz of spectrum at a WiMAX frequency to be reserved by ComReg for use by HEAnet clients only. This would be similar to the exiting agreement between DCENR and HEAnet for use of a pair of fibres on the ESBT national fibre network. HEAnet has made maximum use of the ESBT fibre pair by creating a national backbone for HEAnet clients nationally using this pair.

HEAnet has demonstrated over many years an ability to promote innovation within the higher education sector by delivering and operating a state of the art national fibre network. We believe that HEAnet is well positioned to maximise the potential access to a licensed WiMAX frequency band for the education sector in Ireland. There is an opportunity for Ireland to take a leading role in providing mobile access for third-level students and researchers.

Included in the appendix are letters from the Irish Universities Association, Institutes of Technology Ireland, NUI Mayooth, Trinity College Dublin and the Centre for Telecommunications Value Chain Research (CTVR) which all support this response by HEAnet to your strategy document.

7 Appendix 1

Executive Summary of HEAnet Wireless strategy

8 Appendix 2

Letters of Support:

- National University of Ireland Maynooth, 10th April 2008
- Centre for Telecommunications Value-chain Research, 11th April 2008
- University of Dublin, 16th April 2008
- Irish Universities Association, 30th April 2008
- Institutes of Technology Ireland, 1st May 2008

10 Hutchison 3G Ireland

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Dublin 2

Ms Sinead Devey
Commission for Communications Regulation
Abbey Court
Irish Life Centre
Abbey Street
Dublin 1
BY POST AND EMAIL: sinead.devey@comreg.ie

2 May 2008

Dear Sinead

SUBMISSION RE: COMREG 08/20

I refer to ComReg Doc. No. 08/20 *"Proposed Strategy for Managing the Radio Spectrum: 2008 – 2010"*. Hutchison 3G Ireland Limited ("H3GI") hereby responds as follows.

900 MHz and 1800 MHz

H3GI welcomes ComReg's proposal to hold a comprehensive public consultation(s) on the 900 MHz and 1800 MHz bands during 2008. However, it wishes to highlight and emphasise the need for ComReg to ensure a level playing field in respect of the provision of 3G services.

2.6 GHz

H3GI also welcomes ComReg's proposal to hold a consultation to develop a coherent strategy to facilitate the development of 3G services in the 2.6 GHz band. H3GI believes that the development of 3G services in the 2.6 GHz band is necessary in order to ensure that Ireland remains innovative and competitive.

Mobile Broadcasting and the UHF Band

H3GI looks forward to ComReg's consultation in respect of the conditions which could be applied to mobile TV in the UHF band shortly.

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Yours sincerely

MARK HUGHES
Head of Regulatory

Copy: Mr Robert Finnegan, Managing Director, Hutchison 3G Ireland Limited
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11 Intel

Friday, 2 May 2008

Intel Response to "Proposed Strategy for Managing the Radio Spectrum: 2008 - 2010."

Consultation title: Proposed Strategy for Managing the Radio Spectrum: 2008 - 2010.

To (ComReg contact):

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Representing: Intel Corporation (UK) Ltd

Address: Pipers Way, Swindon, Wilts, SN3 1RJ, UK

Intel welcomes the opportunity to respond to the consultation offered by ComReg on its development of a strategy for managing the radio spectrum from 2008 to 2010. Intel respectfully submits the following comments on specific points raised in the consultation and have annotated accordingly.

4.3 Market Mechanisms and Spectrum Management

Intel supports the market based approach to spectrum management and considers auctions the most efficient method to assign spectrum in a quick, fair and transparent basis.

Moreover, Intel believes that in the case of the 2.6 GHz band it is appropriate to consider an auction process that identifies the market demand prior to assignment. Intel does not believe there is sufficient basis to believe the so called CEPT band plan referenced in ECC Dec(05)05 is suitable in the majority of European markets and that it is likely to make TDD spectrum artificially scarce.

4.4 New Spectrum Opportunities

2300 – 2400 MHz; Intel considers this spectrum band to be important for the delivery of new innovative wireless broadband services. Given the current difficulties that ComReg would face in enabling WAPECS type services in the 2500 – 2690 MHz band, Intel recommends that ComReg make the 2300 – 2400 MHz (or parts of) band available in a timeframe sooner than 2009. Mobile WiMAX is currently available to operate across the 2.3 – 2.7 GHz (WiMAX Forum profiles 1B & 3A) band in a TDD configuration). Intel supports the WiMAX Forum assessment that at least 30 MHz of TDD spectrum is required per operator to deliver future mobile broadband services.

2500 – 2690 MHz; Intel recommends that ComReg make the band (or parts of) available to enable WAPECS type services in line with the EC Decision for the 2.6 GHz band.

3660 – 3710 MHz; Intel believes that this band should be utilized as soon as possible and recommends that mobile services be enabled as proposed in the recent EC Decision for the frequency band 3400 – 3800 MHz.

3760 – 3800 MHz; Intel also believes that this band be utilized as soon as possible and recommends that mobile services could be enabled as proposed in the recent EC Decision for the frequency band 3400 – 3800 MHz.

57 – 66 GHz; Intel believes this band could provide an important means of delivering short range high bandwidth in-home applications. Wireless Personal Area Networks (WPAN) systems are envisaged in this band across other parts of the world, namely US, Japan and other parts of Asia. CEPT has recently completed coexistence studies for such applications in this frequency range and the ECC is considering a licence exempt allocation across the 57 – 66 GHz band. The unique propagation properties in this frequency range offer great potential for very high bandwidth short range applications. Intel requests that ComReg make this band available consistent with any ECC Decision/Recommendation for WPAN systems in the frequency range 57 – 66 GHz.

7.2.2 Spectrum for Public Mobile Services

Intel notes that ComReg is considering a future consultation to develop a strategy for future 3G services in the 2.6 GHz band. Intel does not believe that this band should be limited to 3G services. Rather, in line with WAPECS, the EC spectrum Decision and the development of the least technically restrictive requirements in CEPT SE42, Intel recommends that the band be made available for any future wireless services whether IMT or not. The regulatory framework of the EC spectrum Decision should enable licensees to choose the most appropriate technology to deliver a range of services with minimum hindrance. Intel does not believe the band plan referenced in ECC Dec (05)05 will be appropriate in all cases for future wireless services. A flexible approach would better meet market demands.

7.2.4 Proposed ComReg Strategy for Public Mobile Services

Intel notes the comments regarding WiMAX made under this section but it is unclear whether they are the views of the Yankee Group report or ComReg. *"Mobile WiMax which has an uncertain future because of the focus by mobile network operators on UMTS and HSPA".*

Intel respectfully disagrees with the above comment. Indeed, we believe the future of WiMAX is promising. WiMAX trials and deployments currently exceed 300 worldwide. The continued growth and demand for mobile internet access demonstrate a potentially strong demand for mobile internet enabling-technologies such as WiMAX. The WiMAX Forum recently announced the first mobile WiMAX devices to be WIMAX certified covering the 2.3 – 2.7 GHz band. But access to spectrum across Europe in a timely manner will be key to the future success of mobile internet-enabling technologies.

As stated in our response to 7.2.2 Intel recommends that ComReg develop a coherent strategy for the 2.6 GHz for future wireless services that are not restricted to so called 3G services. The development of a WAPECS regulatory framework would enable greater access to spectrum by differing technologies and services, Intel supports this approach for future spectrum management action.

7.5.2 Proposed ComReg Strategy for WBS

Intel supports the proposed ComReg strategy to implement the EC Decision for the 3.4 – 3.8 GHz band.

Glossary

Intel notes that ComReg has described WiMAX as follows;

WiMAX Family of standards under development for broadband wireless access in bands above 3 GHz, also referred to as IEEE 802.16.

Intel notes that WiMAX is also being considered for use in bands below 3 GHz, including in 2.3 – 2.7 GHz and below 1 GHz.

End-of-Document

12 Irish Broadband

PROPOSED SPECTRUM STRATEGY FOR MANAGING THE RADIO SPECTRUM: 2008-2010

IRISH BROADBAND'S RESPONSE TO THE CONSULTATION

1. Introduction

In January 2004 Irish Broadband was awarded seven Fixed Wireless Access Local Area (FWALA) licences in the 3.5GHz band, and subsequently was awarded more than twenty additional licences. Since 2004 Irish Broadband, has deployed an extensive national broadband wireless network and has grown its customer base from 4,000 at the end of 2004 to over 50,000 customers to-day. In addition, the company holds 10.5GHz and 26GHz FWALA licences in the main population centres and has deployed an extensive wireless network in these locations, providing uncontended data connections for business customers. Irish Broadband has been at the forefront broadband service delivery in Ireland and has contributed significantly to Ireland having the highest uptake of wireless broadband services in Europe (16% of all broadband subscribers).

Irish Broadband believes that there is now an opportunity to build on the success of wireless broadband in the Irish market. The WiMAX standard offers a unique opportunity for Ireland to once again be at the forefront of international telecommunications developments. ComReg should utilise this opportunity to help to create the environment by which WiMAX services can be deployed rapidly in the Irish market.

The successful and rapid deployment of WiMAX in Ireland requires:

1. Expansion spectrum in the 3.4-3.6GHz band to be made available to existing providers on the basis of demonstrable need.

2. Award of 2.3-2.4GHz spectrum as early as possible and by Q1'09 at the latest to provide regulatory certainty and facilitate deployment of networks in line with equipment availability.

3. Expansion spectrum to be made available in 3.6GHz to 3.8GHz. However, this is likely to have less of an impact than 1 or 2 due to equipment availability issues.

Irish Broadband welcomes the opportunity to respond to this consultation.

2. Response to Consultation – WiMAX Spectrum

The following summarises the key points that we would like to make in respect of the licensing approach, timeframe and spectrum bands as they apply to implementation of WiMAX (and other broadband wireless) services in Ireland.

In particular, the relevant spectrum bands are:

- 3.4-3.6GHz – Standard WiMAX band

- 2.3-2.4GHz – Standard WiMAX band

- 3.6-3.8GHz – Standard WiMAX band (with limited vendor support)

- 10.5/26GHz – Non WiMAX bands, but used for other, complimentary broadband wireless services

These bands are discussed in more detail below.

3.4-3.6GHz

The available spectrum in this band includes 20MHz allocated to guard bands (3400-3410MHz plus 3500-3510MHz) as well as 28MHz designated as channel E in the band plan (3410-3424MHz plus 3510-3525MHz).

Channel E is available in Dublin, Cork, Limerick, and Waterford whereas the guard bands are available nationally.

What approach should be used for this band:

From the inception of the FWALA scheme, ComReg and its predecessor, the ODTR, have explicitly recognized that if operators are successful in gaining customers and bringing competition to the broadband market, their needs for spectrum will increase.

In relation to 3.5GHz specifically, ComReg's Guidelines to Applicants for Fixed Wireless Access Local Area (FWALA) Licences, document 03/97, as well as subsequent versions 06/17 and 06/17R1, all referred to the 'E' channel as expansion spectrum:

"A small amount of additional spectrum (2 x 14 MHz, Channel E) is available in the Dublin, Cork, Limerick and Waterford urban areas, as described in Table 1 below. Because of the limited availability of this spectrum it is intended that this may be used in the future as expansion spectrum in these limited areas" (ComReg 03/97).

It is Irish Broadband's view that ComReg should make good on its earlier commitment to release expansion spectrum to FWALA operators on the basis of demonstrable need. In our view the 3.4-3.6GHz guard band as well as the Channel E band are the optimal bands to meet this commitment.

The advantages of this approach are that:

- Spectrum fragmentation is reduced thus ensuring that existing WiMAX operators have sufficient spectrum to provide high quality data services and thus ensure that Ireland has a high quality, high capacity WiMAX service offering that can enhance overall platform competition in the broadband market.

- Award to existing broadband wireless operators will ensure that time to market is improved and that Ireland has a national WiMAX network in line or ahead of international peers.

- By providing a critical mass of spectrum to individual operators, channel size per sector, and hence throughput per sector is increased. This improves the overall business case for WiMAX services thus creating an improved investment case for a national WiMAX network.

Timeframe for 3.4-3.6GHz

The 3.4-3.6GHz band (channel E plus guard bands) should be released as an immediate priority by ComReg. This is a standard WiMAX band with universal support from base station and CPE equipment vendors. Intel has also committed to shipments of WiFi/WiMAX combo modules for the 3.5GHz band from Q2 2009. Irish Broadband is planning to migrate part of its network to WiMAX using its existing spectrum in by Q4 2008. This means that under existing spectrum allocations WiMAX should be commercially available in Ireland in 2008. However, further expansion of this network in an efficient and cost effective manner requires additional spectrum in this band.

2.3-2.4GHz.

2.3GHz-2.4GHz is a standardised band for WiMAX globally. There are numerous deployments in this band of particular note being KT's deployment in Korea with over 100,000 customers at end 2007. Given the likely practical delays in releasing the 2.5GHz band, 2.3-2.4GHz is the optimal band for WiMAX deployment in the short term.

What approach should be used for this band:

2.3GHz spectrum should be awarded on the basis of a comparative selection procedure. This should take into account aspects such as contribution to enhanced competition, services and network roll-out.

Should an auction be used strict deployment and service criteria should be included in the licence specification. Otherwise there is a risk that spectrum will be acquired and hoarded by an existing player both to restrict competition or to provide a future technology option in the event WiMAX is successful. Given the lack of slow pace of innovation in fixed broadband, such an outcome could further damage Ireland's international reputation for provision of broadband services.

Indeed in the recent Japanese 2.5GHz licence award, holders of 3G mobile licences and their subsidiaries were specifically excluded from participating in the 2.5GHz award. This approach was taken to promote competition between 3G and broadband wireless players and to encourage new innovative entrants to the market. Irish Broadband supports the view that the award of 2.3GHz spectrum should be used as an opportunity to enhance competition in the broadband market and should not be allocated to existing payers which have an incentive to hoard the spectrum and not to provide services that compete with their existing product sets.

Timeframe for 2.3-2.4GHz

2.3-2.4GHz is a globally standardised WiMAX band. Base station equipment and CPE is available now for deployment in this band. Intel chipsets for laptop integration will be available in the same timeframe as for the 3.4-3.6GHz band (i.e. from Q2 2009). This band also has the advantage of better in radio propagation characteristics than 3.5GHz which could reduce site deployment requirements by up to 20% to achieve the same coverage.

Therefore, Irish Broadband believes that 2.3GHz should be a priority band for release by ComReg and award of this band should follow allocation of expansion spectrum in the 3.4-3.6GHz band.

3.6-3.8GHz.

This band is part of the WiMAX band plan. However, base station equipment and CPE availability is patchy with many vendors waiting to see if there are significant deployments in this band before committing to equipment development. Therefore, the 3.6-3.8GHz band is not as attractive as either 3.4-3.6GHz or 2.3GHz for immediate WiMAX deployment.

What approach should be used for this band:

3.6-3.8GHz should be awarded using the existing FWALA scheme. Irish Broadband will respond to the consultation regarding award of this spectrum.

Timeframe for 3.6-3.8GHz band

This band should be awarded at the same time as the 3.4-3.6GHz band. This would allow ComReg to move on quickly to further licence awards, including the 2.3GHz band.

10.5/26GHz.

Irish Broadband believes that the reserve price for the recent 26GHz auction was too high. The only business case that works at this reserve price is for a significant annual deployment of point to point radio links in the band. There is no business case for point to multipoint at this reserve level. Therefore, Irish Broadband is concerned that this pricing level could set a precedent that essentially sterilises the 26GHz (and the 28GHZ band) for point to multipoint applications. While recent FWALA allocations in 26GHz mean that this should not be an immediate problem, it will become an issue in 12/18 months as new 26GHz point to multi-point network fills. Should this happen, ComReg should look at releasing further expansion spectrum in the 26/28GHz band on a demonstrable need basis, and not on the basis of the recent auction. It would be hugely disappointing if point to multipoint applications were driven from this band as a result of the recent pricing policy. This is particularly the case, as unlike point to point microwave there are only a limited number of high frequency bands (10.5/26/28GHz) where point to multipoint equipment is commercially available.

3. Response to Consultation – Additional Comments on a per Section Basis

6. Strategy for Managing the Radio Spectrum

Irish Broadband is in general agreement with the overall approach outlined for managing the radio spectrum.

In particular the creation of an environment that supports the rapid development of a national WiMAX network would support the vision of improving access to “a

wide range of competitively-priced quality products" and support "innovation in converging platforms and technologies".

7.2.2 Spectrum for Public Mobile Services:

2010-2025MHz Band:

It is not clear to Irish Broadband that there is a market requirement at the moment for an additional TDD allocation at 2010-2025MHz. 3G in Ireland is at a relatively early stage of adoption and network deployments have been relatively recent. Therefore, there should not be a requirement for additional spectrum for mobile data services at present. The 2.3-2.4GHz band instead should be prioritised for release in Ireland.

2500-2690MHz Band:

The 2500-2690MHz band is the optimal band for use for WiMAX and other IMT-2000 mobile data services.

This is the band being utilised by Sprint in the US for its 2008 WiMAX deployment. Equipment development in this band is typically running at 6 to 9 months ahead of the 3.5GHz band at the moment. Therefore, allocation of this band in 2008 would be ideal for deployment of advanced mobile data services.

It is unfortunate that this band is utilised in Ireland for terrestrial television services. Given the practical timescales up to 2014 of allocating this band for mobile data services, this places Ireland at a significant competitive disadvantage compared to its European peers. The UK for example has already started the process leading to award of this band. This highlights the requirement in Ireland to prioritise the release of the 2.3GHz band as an alternative to meet emerging mobile data requirements.

ComReg should explore ways to release this band at an earlier date. Given that MMDS services are not licensed in cable franchise areas, this could perhaps be done on a regional or city by city basis to enable advance deployments in these locations.

7.2.4 Proposed ComReg Strategy for Public Mobile Services

Irish Broadband disagrees strongly with the statement that WiMAX has an uncertain future. New WiMAX developments are being announced on a weekly, if not daily basis, and Sprint is on course to launch in their US markets of Chicago, Washington DC, and Baltimore in Q4 2008, an investment in excess of $5bn. Intel are also backing the launch of WiMAX with a robust roadmap of chipset developments spanning multiple frequency bands including 2.3GHz, 2.5GHz, and 3.5GHz bands.

7.3.3 Digital Dividend

We consider that in the design and allocation of the channel arrangements full account needs to be taken of the goals of the i2010 initiative and the work being undertaken by the European Commission Radio Spectrum Committee and CEPT in relation to the implications of the Digital Dividend and the harmonization of sub bands for mobile and broadband services. In this regard, Irish Broadband believes that it would be beneficial to reconsider the channel arrangements in

such a manner that maximises the Digital Dividend for additional wireless services and to facilitate international harmonisation.

7.4 Terrestrial Fixed Services

Irish Broadband's comments on this section are that:

- Of all bands below 3GHz, 2.3-2.4GHz should be the priority band for release;

- 28GHz should be reserved for future expansion of point to multipoint services. If further bands are required for point to point connections then 31GHz and 32GHz should be used instead. This is because commercial point to multipoint equipment is only available in a select few bands including 10.5GHz, 26GHz, and 28GHz.

7.5 Wireless Broadband Services

7.5.2 Proposed ComReg Strategy for WBS

ComReg's strategy for WBS should:

- Ensure release of existing guard band spectrum in the 3.5GHz band allocated as guard band spectrum (3400-3410GHz and 3500-3510GHz). This is a legacy allocation and goes against current ComReg policy which encourages inter-operator coordination.

- Release of Channel E spectrum in those areas where it is currently available. This would help facilitate migration of existing broadband wireless deployments to WiMAX as well as relieving spectrum congestion in Dublin City Centre.

- Prioritise the release of 2.3-2.4GHz spectrum. 2.3GHz is a global WiMAX band and release of this spectrum in 2008 would help to ensure that Ireland remains at the forefront of wireless broadband deployments globally.

- Ensure that the recent EC decision to allow mobility in the 3.4-3.8GHz band be implemented as soon as possible. This would help provide much needed regulatory certainty for future investment in this band.

- Ensure that point to point deployments do not remove the possibility of future expansion of point to multipoint data services in 26GHz or 28GHz either by pricing or other allocation mechanisms.

7.6 Licence Exempt Services

UWB

Irish Broadband would like to make the following comments about UWB.

1. 3.4-3.8GHz has been identified by the ITU WRC as a mobile band and is likely to become a primary band for 4G technologies.

2. Significant network investments have been made in this band by incumbent operators. Mobile WiMAX services means that network deployments in this band are likely to increase over time.

3. UWB is a licence-exempt technology that needs to ensure that it does not pollute licensed spectrum holders.

4. Presently, DAA in the 3.4-3.8GHz bands is an unproven mechanism. At the same time UWB is already allowed to operate freely above 6GHz and hence there is diminished requirement for allowing usage of the 3.4-3.8GHz bands.

Therefore, Irish Broadband does not believe that 3.4-3.8GHz should be included as a licence exempt band for UWB until the potential effects of this technology are on mobile broadband services are better understood.

3. Conclusions

Wireless broadband services have been extremely successful in Ireland with 16% of all broadband connections provided by this means. This success can be largely attributed to the foresight shown by ComReg in releasing 3.5GHz and 10.5GHz spectrum under the FWALA scheme.

There is now an opportunity to build on this success by ensuring that Ireland is optimally positioned to benefit from the new WiMAX standard. This can be achieved by helping to create the conditions to ensure a high quality, national WiMAX service can be deployed in the shortest possible timeframe. Such a development would be extremely positive for Ireland Inc. and, in stark contrast to the slow pace of innovation on the fixed broadband side, would help to position Ireland once again at the forefront of international telecommunications development.

To achieve this Irish Broadband is recommending in this response that ComReg: release 3.5GHz spectrum (channel E and guard bands) on an expansion basis as originally intended; and prioritise the release of 2.3-2.4GHz for national broadband wireless deployments. This will help to ensure that high quality WiMAX-based services can be deployed in the shortest possible timeframe providing a much needed boost to Ireland's broadband infrastructure. There is a fast closing window of opportunity to build on the success of the FWALA scheme to create the environment for the successful deployment of WiMAX-based services in Ireland.

However, from a consumer point of view the benefits of enhanced platform competition are obvious. Indeed, it is no coincidence that mobile data services have been launched aggressively in Ireland by mobile service providers and have been successful. Competition from existing broadband wireless providers has helped to focus development on this area thus driving product innovation and demand.

Equally for mobile data services, the deployment of a national WiMAX based network providing platform competition for mobile data services should be a key pillar of ComReg's mobile services strategy. There is a fast closing window of opportunity for Ireland to build on the success of the FWALA scheme to ensure that spectrum is allocated for WiMAX based services.

This should include:

- Expansion spectrum
- Early release of 2.3GHz
- Release of 2.5GHz in the longer term on a technology neutral basis.

"Accelerate the release of expansion spectrum in the 2.3-2.4GHz band to facilitate the early deployment of broadband wireless technologies such as WiMAX"

13 IRTS

Proposed Strategy for Managing the Radio Spectrum: 2008-2010 (ComReg Document 08/20)

Response from the Irish Radio Transmitters Society

Background

The Irish Radio Transmitters' Society (IRTS) is the national representative society for licensed radio experimenters in Ireland. Its purpose is to encourage radio experimentation, to provide services to its members and to represent the interests of radio experimenters both nationally and internationally. The IRTS is the member society for Ireland of the International Amateur Radio Union (IARU) which represents the interests of the amateur radio service worldwide.

The Society welcomes the periodic publication of these strategy documents by ComReg. They give the various interests an opportunity to comment on and influence ComReg's policy on the management of the radio spectrum – a finite and vital national resource.

Paragraph 7.11

While the formal definition of the Amateur Service in the International Telecommunications Union (ITU) Radio Regulations is mentioned, the IRTS would prefer to see the 'self training' and 'technical investigations' aspects of that definition highlighted, as appropriate, in ComReg publications. These are fundamental to the international recognition of the amateur service as it is acknowledged that many professionals in the field of radio, TV, communications and electronics started their technical education as radio amateurs.

The social benefit provided by the amateur radio service should also be mentioned. This is particularly evident in the context of the provision of emergency communications in times of disaster. This contribution is well recognised and documented. Accordingly, amendments were made to Articles 25.3 and 25.9A of the Radio Regulations at WRC'03 to facilitate the participation in emergency and disaster relief of stations in the amateur

service. The Amateur Radio Emergency Network (AREN), a public service voluntary emergency network, is recognised by ComReg, and both AREN and the IRTS are being included as non-governmental organisations on the list of telecommunications resources being compiled by ComReg in the context of the Tampere Convention.

In summary, for the future, the IRTS would like mention, as appropriate, in ComReg documents, of the social benefit of the amateur service in the context of emergency and disaster relief as well as its potential for self training and technical investigations.

Paragraph 7.11.1

The IRTS welcomes the matters set out here which ComReg intend to bring to a conclusion during the period of the proposed strategy.

The Society is of the view that the proposed 3 kHz channels in the 5 MHz region, and the general release of the present 70 MHz band which are in the concluding stages of being granted, following representations from the Society, should both be mentioned in this paragraph. Similarly, the amendment to the Radio Regulations at WRC'03 under which the frequency segment 7100 to 7200 kHz will become an amateur primary allocation after 29 March 2009 should also be mentioned as a matter to be concluded during the period of the strategy. The Society would also hope that some individual authorisations to operate in the 500 kHz region would be granted to experimenters, similar to those made available in the UK or indeed Belgium, in advance of arriving at a common European position

Other Issues

New Legislation

It is noted from paragraph 6.3.6 that it is anticipated that within 2-5 years a new Radiocommunications Act will be introduced that will replace the Wireless Telegraphy Acts 1926 -1968. In this connection, the IRTS would wish to represent strongly that in any new legislation a provision be included similar to section 6(2) of the Wireless Telegraphy Act, 1926 (No 45 of 1926) under which licences may be granted to persons who require them for the purpose of conducting experiments in wireless telegraphy. This is the

enabling legislative provision for the previous and present Experimenter Licence Regulations which have served their purpose well.

It is assumed that there will be a consultation process at the time of the preparation of the proposed legislation and the IRTS would wish to be included among the interests whose views would be sought.

Licences

It is noted from Paragraph 4.1 that, of the 7100 new licences issued in the period October 2004 to December 2007, about 1% were experimenter licences. It is hoped that the number of experimenter licences will increase gradually with the collaborative arrangement between ComReg and the IRTS introduced in May 2005 under which the Society is responsible for organising, setting and correcting the examination for an experimenter licence. Since this arrangement was put in place just under three years ago, six examinations have been held, 126 candidates have sat these examinations and 75 (60%) of these have obtained the HAREC qualification entitling them to apply for an experimenter licence.

Monitoring and Enforcement Annex A

The IRTS welcomes the development of a network of monitoring stations throughout the country. Reports of unauthorised use of frequencies in the bands allocated to the amateur service have been made by the Society to ComReg. It is likely that more intensive monitoring of the frequency spectrum will allow such reports to be dealt with more expeditiously. The Society will, of course, continue to cooperate with ComReg in monitoring the frequencies allocated to experimenters and in identifying and reporting any unauthorised transmissions.

Some concern is being expressed in the amateur radio press about equipment (in particular computer power supplies) [1]that does not comply with the appropriate EMC Directive. The IRTS would urge that ComReg be vigilant in this matter as all such equipment has the potential to cause serious harmful interference right throughout the spectrum.

[1] RadCom, official journal of the Radio Society of Great Britain (RSGB), April 2008 page 78.

14 Meteor

Response to ComReg's Proposed Strategy for Managing the Radio Spectrum: 2008-2010

An assessment of the economic impact of spectrum usage and a proposed strategy to manage the radio spectrum in Ireland

ComReg Document No: 08/20

Introduction

The following document comprises Meteor's response to ComReg's draft Proposed Strategy for Managing the Radio Spectrum: 2008-2010.

From the outset Meteor would like to stress that changes to the way in which radio spectrum is managed could lay the foundations for the injection of real dynamism in markets that access and use this precious national resource. On the whole, therefore, reform of the current regime is to be welcomed and Meteor supports initiatives proposed that may eventually allow for change.

The strategy of an efficient operator must be to strive for the management of resources available that matches developing technologies and services to the most appropriate delivery mechanism. As technological advances drive the delivery of services, Meteor welcomes the review that the regulator is planning to undertake especially as regards the liberalisation of the GSM spectrum bands to facilitate the growth of public mobile services through the use of 3G and other technologies, the focus given to the release of digital dividend spectrum and the release of spectrum below 4GHz to support broadband and multimedia services.

Meteor notes that comprehensive reforms are proposed in a number of specific spectrum bands, and Meteor would welcome the opportunity to discuss each plan in detail.

Mobile Sector

It is proposed that the regulator will ***conduct a comprehensive public consultation on the 900 MHz and 1800 MHz bands during 2008: the consultation also covering the possible release of currently unassigned spectrum in the 900 and 1800 MHz band.***

Meteor is supportive of the above proposal and urges the regulator to move quickly to defined timelines for consultation. Meteor notes initiatives currently being undertaken at European level to both repeal the GSM Directive[1] and for the adoption of a European wide Decision[2] supporting the introduction of other services within these bands.

Meteor would argue that there are significant economic benefits and benefits of scale for operators to deploy 3G services in the 900 MHz frequency band as well as the 3G core band. Better coverage provides for commercial benefits with the possibility to provide new technologies faster and the provision of services that best respond to customer needs. The potential could also exist for operators to use 18000 MHz spectrum for the same end, and should be explored as part of the general review of the use of these bands.

Timely re-farming is, however, key. As operators roll-out and develop 3G networks and services, they must be able to network plan in a manner which will deliver services in an efficient and comprehensive manner. A timely decision by the regulator with respect to the above bands would underpin future development of the mobile sector. Meteor would urge the regulator, therefore, to move towards a public consultation on the possibility of national re-farming within the aforementioned spectrum bands as soon as possible.

Conducting a public consultation on the future use of the 2010-2025 Mhz spectrum band and, if there is sufficient interest, to initiate a further public consultation and competition design to release this spectrum

Meteor notes that, as indicated in the ComReg Strategy Statement[3] spectrum within this band is currently allocated to 3G TDD only and is subject to market demand. As there is a limited amount of spectrum available within this band, the degree to which future application and use is possible will be constrained.

However, based on the principles of both service and technology neutrality, Meteor would welcome the opportunity to discuss and debate options for deployment within this band within a general review of spectrum options.

[1] EC Directive 87/372/EEC
[2] Draft Decision on the harmonisation of the 900MHz and 1800 MHz bands in the Community
[3] ComReg proposed draft strategy: 08/20 p.15

Formulating a coherent strategy to facilitate the development of 3G services in the 2.6 GHz band in line with market demand whilst accommodating any on-going requirements by MMDS operators and their customers

Meteor notes and welcomes the regulator's intention to develop a coherent strategy for the development of 3G services within the 2.6 GHz band.

Meteor notes that in October 2007 the ITU decided to include Wimax derived technology under the IMT 2000 framework, as the 6th radio interface specification. Meteor would respectfully suggest that the regulator takes account of this development whilst taking a technology neutral stance on the release of any or all of this spectrum.

Broadcast Sector

One of the most innovative application areas for the telecommunications sector is the development and roll-out of mobile TV and mobile broadband services in general. Meteor would argue, however, that there are a number of spectrum management issues which could be viewed as an impediment to development, however, if resolved could facilitate growth and expansion both within Ireland and across the EU.

The European Commission has, in its Digital Dividend Communication[4], outlined a framework for future use of this resource. The Commission has identified wireless broadband communications, additional terrestrial broadcasting services and mobile media as the three broad categories of services for with the spectrum in the "digital dividend[5]" would be well suited. In this regard, Meteor supports the Commission's proposal to move toward a common spectrum plan at European level which would increase spectrum efficiency, use and range.

The Commission's proposals to create three sub-bands, i.e. developing a "top-level" spectrum organisation upon which national and EU wide plans can be developed is a basis on which to move forward.

The release of "digital dividend spectrum" will act as a crucial driver in both the development of and expansion of the telecommunications sector in Ireland and across the EU. The opportunities that such spectrum will afford, in terms of the roll-out of broadband to rural areas, cannot be understated. Meteor would urge national authorities to ensure the timely release this spectrum in accordance with the principles established at European level.

Meteor notes that ComReg is seeking views on the approach that should be taken to releasing national digital dividend spectrum and possible applications that should be taken into account in order to best utilise the spectrum. With respect to specific initiatives Meteor notes that the regulator intends to act in the following areas:

Facilitate the introduction of Digital Terrestrial Broadcasting (including fixed reception and mobile TV) in UHF bands IV and V (470-862MHz)

Meteor notes that the World Radio Council 2007 determined a mobile allocation in the frequency band 790-862 MHz and to identify this band for IMT, however, mobile services are not limited to this frequency band.

The band plan adopted for mobile services in the UHF band will play a crucial role in enabling mobile operators to make the most efficient use of this spectrum. Meteor would urge the regulator to consult in detail on the band plan to be adopted nationally for this spectrum so as to ensure that Ireland is in a position to best utilise this national resource.

[4] COM (2007) 700 FINAL: Reaping the full benefits of the digital dividend in Europe: A common Approach to the use of the spectrum released by the digital switchover

[5] Part of the spectrum from 174-230 MHZ (VHF) and 470-860 MHz (UHF)

As a general rule, Meteor would urge the regulator to create a framework whereby channels below 790 MHz could be extended for mobile use.

Meteor would be of the view that this process should be accelerated so that the benefits of the digital dividend can be realised, as soon as possible.

Seek to licence mobile multimedia services in UHF Band – consult on licence conditions for mobile TV

Meteor welcomes the move by the regulator to seek to licence multimedia services in the UHF band and looks forward to the planned consultation by the regulator on the licence conditions for mobile TV. Meteor is still developing its thinking on the optimum design for a national licensing solution, however, would welcome the opportunity to discuss various options in detail with the regulator.

Conduct a public consultation on the future use of the 1452-1492 MHz band and a competition design to release

Meteor notes that the regulator intends to consult on the future use of the spectrum in the 1452-1492 MHz band, and also notes that the regulator has indicated that the band is ideal for mobile multimedia service. Meteor would agree that the band could be suitable for deployment of multimedia services.

The Terrestrial Fixed Services

Meteor would be in broad agreement with the Comreg strategy for Fixed Services.

Meteor notes that ComReg's strategy is to encourage the use of fixed links for infrastructure and competition development and that **the regulator is studying the potential and demand for new fixed link bands (such as 28GHz, 31 GHz and 32 GHz) and the method for assigning frequencies**.

The above frequency bands are of particular interest for all operators in the deployment of fixed point to point microwave links. Therefore, Meteor would urge the regulator to move to consultation on the above as soon as possible.

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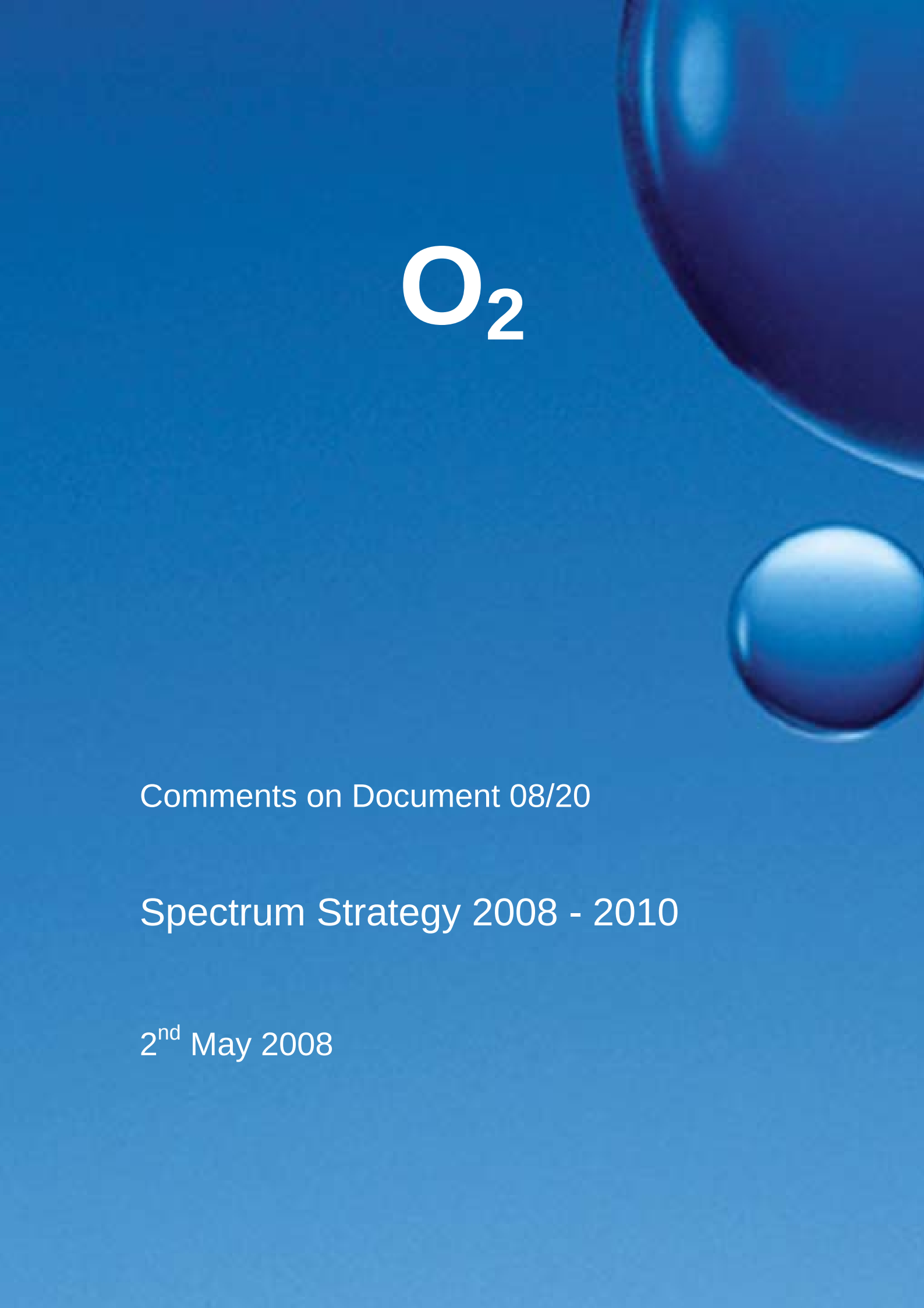

Comments on Document 08/20

Spectrum Strategy 2008 - 2010

2nd May 2008

Introduction

The terms under which an end-user or service provider can access radio spectrum has been relatively stable for a number of decades, with incremental changes being added as and when required. The primary legislative instrument for controlling access to spectrum is still the Wireless Telegraphy Act of 1927, albeit with a large number of amendments. The approach to access and use of spectrum is about to undergo rapid change with a move towards the concept of rights of use rather than a licence for apparatus. Spectrum is increasingly being considered as a resource to be used for the benefit of the citizens of the country, and also as an enabler of innovation. This shift in thinking is being driven on the one hand by consumer demand for higher bandwidth and more mobile access to services, and on the other hand by policy makers keen to ensure that the greatest utility can be extracted from radio spectrum. The move to all digital communications has also been a catalyst for this change.

O2's supports this new approach to spectrum access. Technology and service neutrality coupled with ready access to spectrum should aid innovation, and a framework for transfer of the rights of use should increase the efficient utilisation of this resource. O2 would however sound a note of caution – these changes must be introduced in a manner that gives users of the spectrum the certainty they require to continue to invest in technology, services, and networks. Operators must know that their networks can continue to operate free from interference and that their investments will not be undermined.

Much of the grounding policy and legislation for this new approach to radio will be laid down during the period covered by ComReg's current consultation. The publication of the document is welcomed both for clarifying the high-level principles to be followed by ComReg in the coming two to three year period and also for clarifying ComReg's intention in relation to some specific bands or services. The more clarity ComReg can provide the better; and O2 will respond to the individual consultations that are to be published. O2 would also welcome any additional briefings or information publications that ComReg can provide.

It is clear why the consultation document needs to focus on the period to the end of 2010 – there is a cluster of events that will occur during that time, including negotiation of the amendments to the European Regulatory Framework, and the introduction of new policies like WAPECS that will change the way radio spectrum is accessed. ComReg also needs to "keep one eye" on the longer term

as the decisions taken today must remain compatible with the long term requirements for spectrum assignments, e.g. we need to now begin planning for the long term evolution of mobile services which ideally would require individual channels of up to 20 MHz. Investment cycles also tend to be significantly longer than three years and this must be taken into account.

The Wireless Telegraphy Act of 1927 is still the primary piece of legislation controlling use of the radio spectrum. Though it has been amended admirably down through the years, it is no longer appropriate as the legislative basis for use of radio. It primarily focuses on the possession and operation of apparatus, rather than rights to use a resource. It does not lend itself to the transfer or trading of rights of use. In some ways, it is remarkable that this Act has survived for so long in what is considered to be a "rapidly changing environment", however it is now time to replace it with a new instrument that has been designed to support the conditions for access to spectrum that will be introduced in the next three years. This is an area within the competence of the Department of Communications Energy and Natural Resources, however they will require assistance from ComReg in framing this new legislation. Though the EU Framework amendment will not be finalised until next year, it is known that there will be changes relating to radio spectrum, and O2 believes it is now time to begin the process to prepare primary legislation in Ireland.

O2 supports the general policies that ComReg proposes in this consultation document, which are driven by the wider strategy adopted for the electronic communications sector. Radio is critical for the success of this strategy, and ComReg's data shows its importance to the economy as a whole: - radio currently contributes 1.67% of GDP, increased from 1.4% in 2003. As the consultation document states, Ireland has a natural advantage with a relatively low population density and being geographically removed from the continent. The Test and Trial scheme is one example of how Ireland can use this advantage, and O2 has used this scheme to evaluate Mobile TV. We have also seen how wireless access can play a significant role providing broadband service – Ireland has among the highest proportion in Europe of wireless broadband access. The aim should be to extract maximum utilisation from the spectrum, and this will involve providing for rapid access, transfer or trading, technology neutrality, but also ensuring that the most appropriate bands are opened up for particular services.

ComReg has generally proposed that frequencies below about 3GHz should become more widely used for mobile applications. This is a principle that O2 would support. The propagation characteristics of

the UHF band make it most suitable for mobile use, whereas services that are fixed can take advantage of antennae that are both physically higher, and have higher gain, to function at higher frequencies. This is not an absolute rule however and there are some cases where fixed services can benefit from use of spectrum in the UHF band.

Comments on some of the specific issues covered in the consultation document are given in the section below.

Response to Specific Topics in the Consultation

Market Mechanisms and Spectrum Management

In general, O2 supports market based mechanisms to ensure spectrum is efficiently used. At present, the legislative framework does not adequately provide for these, e.g. licences are non-transferable, which emphasises the need for change in the Wireless Telegraphy Act. The most appropriate method for ComReg to use in making assignments will vary on a case by case basis. There are some cases where auctions have proven successful, e.g. the all-Ireland allocation of spectrum in the 1.8 GHz band, or the 26GHz auction which is currently in progress, however their effectiveness is diminished by the lack of secondary trading.

There are also cases where an auction will not be the most appropriate assignment method. In particular, these arise where there may be public policy or social considerations, e.g. the National Broadband Scheme. While an auction will often raise substantial revenue for the exchequer, it can lead applicants to over-bid, leaving them starved of the resources needed to roll out their service. The applicant who bids the highest amount is not necessarily the one who would invest most in the service. In section 4.3.1, ComReg states that auctions are the preferred assignment method where demand exceeds supply. While generally supporting the use of auctions, O2 would caution against a blanket policy in this regard as there will be cases where either a beauty contest or first-come-first-served process will be better.

Auctions are only a first step towards further liberalisation. When spectrum is acquired through an auction operators should be given the right to trade that spectrum too. The existence of a secondary market is the only way to allow for a proper valuation of the spectrum at the time of the auction and will create more fluidity in the market, allowing for easier market access and exit.

New Spectrum Opportunities

UHF Broadcasting Band – O2 welcomes the proposed consultation regarding Mobile TV and will respond to this document. O2 has carried out a significant trial of Mobile TV in Ireland, and is keen for ComReg to clarify its proposals for an assignment of spectrum for this service.

GSM 900/1800 Band – There is no escaping the impact that mobile communications has had on society and the economy – there are now 116 mobile phones for every 100 people, and Mobile contributes €1.4bn annually to the economy. Mobile is also having a significant impact on the way we access the internet, and on the availability of internet access. This is a trend that will continue for several years to come. With each customer's demand for bandwidth continuing to grow, network operators and service providers will need to continue to invest and will require larger spectrum allocations.

The "liberalisation" of assignments in the traditional GSM bands will allow 3G and other compatible services to be carried in the 900MHz band. This opens the possibility for mobile broadband service with better network coverage, particularly outside of the main cities. There are a large number of practical considerations that must be taken into account when considering the future of this band, including ComReg's long term objectives for mobile services. Requirements for the Long Term Evolution of mobile services, and the benefits that might be gained from the Digital Dividend will also need to be included in these considerations.

O2 supports ComReg's proposal for a separate consultation on this subject and believes it is well warranted considering the importance of mobile services to consumers.

Strategy for Managing the Radio Spectrum

O2 agrees with ComReg's overall strategy for management of the radio spectrum. As stated above, the achievement of some of these goals (e.g. market based mechanisms for assignment) will require legislative change. The move to provide spectrum below about 3GHz for mobile multimedia services is also welcome, however there will remain a small number of cases where other services will also require access to this spectrum.

Ireland is a relatively small player on the world stage, and it would be impossible to attend all of the working groups, project teams,

conferences and other forums that develop policy and set standards. Nonetheless, Ireland's interests can be (and have been) promoted by membership of the appropriate European and international organisations. Though attendance may be by the Department of Communications or ComReg, or both, there is relatively little co-operation with industry in preparing for these meetings. O2 believes this is an area that could be improved on, and that requires additional co-operation from all parties.

WAPECS

O2 views the WAPECS initiative as a positive one – to provide spectrum on a technology and service neutral basis. Based on experience to date in the UK, however, we believe that this will require a significant amount of effort and time from all stakeholders, including developing an understanding of the full implications of a move towards service and technology neutrality under the WAPECS banner. Provided the appropriate compatibility requirements of existing services are respected, this should lead to more efficient use of radio spectrum.

Public Mobile Services

The 2.6 GHz band (3G expansion band) is currently in use in Ireland for MMDS, but other European countries have already begun the process of assigning this spectrum for mobile services. In Ireland we should take a considered view of what the long term demand for spectrum for both mobile and broadcasting services will be before deciding the use of this spectrum. Liberalisation of the 900MHz/1800 MHz bands and the Digital Dividend are other areas that should form part of this consideration. O2 would welcome a workshop that would cover the breadth of these interrelated spectrum bands and issues.

Digital Dividend

As stated previously, O2 believes the future use that is made of the spectrum released by switch over to digital TV is inherently tied to the strategy for mobile communications and broadcasting. The future demand for spectrum for both types of service must be assessed, and a balance found that delivers the maximum overall benefit for Irish citizens. This would inform Ireland's position at future international meetings that consider how the Digital Dividend spectrum will be used.

Terrestrial Fixed Services

In general, O2 is of the view that the there is a limited number of cases where the UHF band is suitable for use to provide fixed links. In particular, the antennae characteristics in the 450-470MHz band mean re-use of channels is very limited and the service is inefficient in the band. ComReg should close this band for fixed link applications and instead use the higher UHF bands where this service is required.

1.3GHz Band - O2 believes Option 1 is the most efficient as Option 2 may require two guard bands between the fixed and future, potentially mobile services. Though licences in this band are annually renewable, O2 recognises that it may be unreasonable to require users to re-tune existing equipment coinciding with the next annual renewal date. This will depend on individual circumstances, and on the ease with which equipment can be re-tuned but, in general, O2 considers that existing investments and operational practices should be taken fully into account before ComReg determines the relevant notice period for asking existing licensees to move their frequency of operation.

1.4GHz and 2GHz Bands – O2 is not aware of the current level of utilisation of this band, but agrees with the general principle that sub-3GHz is most valuable for mobile services, and that spectrum should be efficiently used. It is also recognised that there will be a small number of cases where fixed services can most effectively be provided in this band.

High Capacity Links – Microwave radio links above 5GHz can play an important role in the roll-out of network infrastructure, particularly for provision if high capacity fixed links. ComReg is currently in the process of licensing spectrum in the 26GHz band, but it would be useful for the strategy statement to provide greater clarity regarding the future release of other bands, like 28GHz or 31GHz/32GHz.

Licence Exempt & Short Range Devices

There is no doubting the benefits that have been gained through allowing low-power licence exempt applications in certain bands. It can also be expected that a growing number of devices will operate in these bands, however there is no evidence that additional spectrum is needed for these services.

Ultra Wideband Technology

O2 has some concerns about the proliferation of devices that are not licensed or registered in any way, but which operate across bands where protected licensed services operate. ComReg should take a cautious approach to these devices. Though they may

operate on a non-interference basis, it would be difficult to pinpoint those devices that are causing interference and practically impossible to eliminate them. These devices could have the effect of generally degrading the quality of service available to licensed/protected services.

..

16 Qualcomm

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Ms. Sinead Devey

Commission for Communications Regulation
Irish Life Centre
Abbey Street
Dublin
Ireland

Rome, 2 May 2008

Dear Ms Devey

Qualcomm response to ComReg's consultation on the proposed strategy for managing the Radio Spectrum (2008 – 2010)

Qualcomm welcomes the opportunity to respond to ComReg's public consultation on the *Proposed Strategy for managing the Radio Spectrum (2008 – 2010) and the Assessment of the economic Impact of Spectrum Usage and a Proposed Strategy to manage the Radio Spectrum in Ireland.* As a leading developer of advanced wireless technologies, Qualcomm believes that in order to enable innovation, competition and the successful commercial development of wireless technologies in Ireland and in Europe, a sound spectrum policy framework should be based on technology neutrality, application neutrality and pan-European implementation of harmonized technical spectrum usage rights.

Qualcomm is therefore generally in agreement with the overall spectrum policy objectives proposed by ComReg in its strategy for managing the radio spectrum. In particular, Qualcomm supports:

- ComReg's plans to launch a public consultation in 2008 on the future use of the 900 MHz and 1800 MHz spectrum. Qualcomm strongly urges ComReg to allow as early as possible the refarming of the 900 MHz and 1800 MHz, enabling the use of these band by 3G in line with the technical spectrum rules defined in ECC Decision (06)13,

- ComReg's proposed strategy to seek to license Mobile TV services in the UHF band. Qualcomm further believes that this licensing should be done as early as possible,

since as correctly pointed out by ComReg, there is a market demand for Mobile TV services in Ireland,

- A coordinated European approach for the harmonization of the UHF Digital Dividend which will enable the cost efficient deployment of a range of innovative and convergent audiovisual and mobile services such as Mobile TV, 3G and LTE,

- ComReg's plans to formulate a coherent strategy to facilitate the development of 3G services in the 2.6 GHz band. In this context, Qualcomm urges ComReg to adopt the 2.6 GHz European harmonized band plan as set in ECC Decision (05)05 (2x70 MHz FDD and 50 MHz TDD) in order to ensure economies of scale and reduce the risks of interference,

- ComReg's proposal to close the 450 MHz band to new fixed link applications and to move over the next three years all remaining links out of this band, in view of changing its future allocation and making it available for new mobile services.

Qualcomm views regarding spectrum policy proposals put forward by ComReg in its consultation paper are further detailed in the Annex. Wassim Chourbaji (*email*: wassim@qualcomm.com, *phone*: +33620386431, *address*: 40 rue d'Oradour sur Glanne, Paris, France) remains available for any further information that you may request regarding this response.

Sincerely yours,

Isabella de Michelis di Slonghello
Senior Director, Government Affairs
Europe Middle East and North Africa
idemiche@qualcomm.com

ANNEX

Qualcomm views on ComReg's spectrum policy proposals

1. Wireless Access Platforms for Electronic Communication Services (WAPECS)

ComReg's proposed strategy on WAPECS is to develop a generic licensing framework and the necessary secondary instruments that permit the licensing of WAPECS services, which may include multimedia services, in Ireland. This licensing framework will:

- Promote technology neutrality whenever possible,
- Promote service neutrality where such a designation is not in conflict with the national interest,
- Ensure that spectrum assigned is used efficiently and effectively.

Qualcomm believes that a spectrum policy framework based on technology neutrality, application neutrality and pan-European implementation of harmonized technical spectrum usage rights enables an efficient use of spectrum, innovation, competition and the successful commercial development of wireless technologies in Ireland and in Europe. With regards to service neutrality, Qualcomm considers that there is a need to distinguish between *application neutrality* (e.g. voice, data, video services …) and *'radio' service neutrality* (Uplink / Downlink bands, High power / Low power …). While Qualcomm supports the principle of *application neutrality* as it is an important policy to cope with innovation and convergence in the wireless world, we believe that *'radio' service neutrality* would lead to an increased risk of interference and inefficient use of spectrum and should therefore be avoided.

2. Spectrum for Public Mobile Services: 900 MHz, 1800 MHz and 2.6 GHz

Mobile services increasingly participate in assisting people in life's everyday requirements. On a typical day, over 1 billion people worldwide rely on mobile-service offerings to get them through their daily routine.

3G services are important because they are an affordable way to provide voice and data access even in rural areas where landline access is limited or does not exist. For governments, this would mean that 3G and future LTE services are a fundamental way of increasing their countries' teledensity and Internet penetration rates and bridging the digital technology gap. For citizens, 3G and future LTE services may represent their primary way how they are able to connect to broadband Internet and its resources. Mobile services are also key because they provide new avenues to address issues of public importance such as Internet connectivity, education, public safety, health care, governance and environmental conservation in a sustainable, efficient and cost effective manner.

3G is re-shaping the social relations between people, facilitating the creation and dissemination by individuals of new forms of online content, changing the way business is conducted, in particular by small entrepreneurs, and improving the security of citizens.

The development of reasonably priced new services such as e-health, e-education, public safety, government services, etc. will require the release of additional frequency resources in lower frequency bands in order to roll out cost efficiently Mobile TV, 3G and future LTE networks:

Mobile Communication - Mobile services are changing the landscape of how people communicate daily; specifically, the why, when, how often, and in what degree they communicate. Today, mobile communication can be ubiquitous (anytime, anywhere, anyplace), personal (instant messaging, picture cards, video messaging) or interactive (push-to-talk [PTT], video telephony, video sharing).

Mobile Healthcare - Mobile healthcare services are designed to enable a better quality of life 24 hours a day, seven days a week for outpatient treatment and monitoring procedures. These services allow the capture of patients' medical data at the point of care, enabling faster diagnosis and timelier treatments. Mobile healthcare services provide freedom, mobility and an enhanced sense of wellness for outpatients, and peace of mind for caregivers.

Mobile and Remote Education - Mobile education services have created new avenues for learning. They provide the ability to receive live or cached classroom instruction or vocational training in a mobile or distance-learning environment.

Mobile Government – Mobile government services make public services more accessible to citizens and enterprises and hence contribute to improving the internal functioning public administrations. Public services become available 7/7 and 24/24, more convenient to use, better adapted to the needs of people and more personalized. Administrations can deal with requests more speedily, their transparency and reactivity are increased, administrative procedures are simplified, the information is released faster and, when needed addressed, to the specific groups concerned.

Mobile Public Safety – Intelligent cars and intelligent transport systems are amongst the new applications strongly promoted by the European Commission who encourages the development and the adoption of new technologies making cars safer, cleaner and more efficient. Mobile technologies have also become an essential tool for effective emergency response and crisis management.

Location-Based Services (LBS) – LBS services will take full benefits of the future deployment of the Galileo system. For the enterprise customer, LBS means the efficient tracking of goods and services. For a consumer, LBS enhances the level of comfort by knowing the location of a child or elderly parent. For retail shops and restaurants, LBS provides timely directions for a customer who is lost. Mobile LBS provide end users with location information when and where they need it most.

Mobile Commerce - The old adage “time is money” has never been truer than in today’s fast-paced economy. Mobile-commerce services (m-banking, m-payment, e-money, etc.) provide a new level of convenience and safety for managing money transactions.

Mobile Entertainment - Mobile entertainment gives end users the flexibility and freedom to engage their favourite form of entertainment programming on their terms. Mobile TV (live or cached), videos and movies (streaming or on demand), music (full tracks), gaming (casual and 3D multiplayer), or social networking (user-generated or community-developed content) are all available.

Mobile Enterprise - Mobile enterprise services are at the forefront of early wireless-technology service adoption. The implementation of mobile enterprise services provides a competitive advantage to corporations wanting to gain an edge.

ComReg's proposed strategy for the public mobile services centers inter-alia on:

- Conducting a comprehensive public consultation on the 900 MHz and 1800 MHz bands during 2008 in order to make an informed decision well before any licences expire. This consultation is also intended to cover the possible release of currently unassigned spectrum in the 900 and 1800 MHz.

- Formulating a coherent strategy to facilitate the development of 3G services in the 2.6 GHz band in line with market demand whilst accommodating any ongoing requirement by MMDS operators and their customers.

2.1 Liberalisation of the 900 MHz and 1800 MHz bands

As the mobile industry in Europe expands from GSM/GPRS/EDGE for voice with a limited data user experience towards WCDMA/HSPA offering greater capacity, faster data rates, shorter download times and lower costs, the refarming of the 900 MHz and 1800 MHz is becoming increasingly important. Beyond HSDPA and HSUPA, HSPA+ (3GPP Release 7) will offer as soon as 2009 a significant evolution in data rates (downlink up to 42 Mbits/s and uplink up to 11 Mbits/s) comparable and superior to those offered over ADSL enabling seamless user experience across fixed and mobile networks and the generalization of mobile internet services.

In January 2006, Qualcomm achieved with its partners the industry's first WCDMA and HSDPA calls at 900 MHz. Qualcomm recently sampled RTR 6285, a highly integrated, single-chip, quad-band WCDMA solution that allows support of WCDMA/HSPA in the 900 MHz band at no additional chipset cost. Since 2006, Qualcomm has also been involved in a number of UMTS900 field trials which allowed to test coverage and capacity comparison, adjacent channel interference, co-channel Isolation distance, building penetration and indoor performance as well as site solution tests (antenna sharing, TMA configuration) and mobility.

Qualcomm supports ComReg's plans to launch a public consultation in 2008 on the future use of the 900 MHz and 1800 MHz spectrum. Furthermore, Qualcomm strongly urges ComReg to allow as early as possible the refarming of the 900 MHz and 1800 MHz, enabling the use of these bands by 3G.

2.2. Implementation of a harmonized band plan for the 2.6 GHz band

Qualcomm believes that the 2.6 GHz will sustain the fast market growth of 3G services and future 4G services. With more than 100 million subscribers worldwide, 3G technologies are continuing to evolve towards higher data rate capabilities (such as HSPA+ and Long Term Evolution - LTE) that will benefit from the 2.6 GHz which offers the unique opportunity of wider bandwidths up to 20 MHz.

Qualcomm plans to integrate support for the 2.6GHz band into its entire HSPA/HSPA+ chipset portfolio, and has already announced three chipset solutions that support HSPA/HSPA+ devices at 2.6GHz: the Mobile Data Modem™ (MDM™) MDM8200™, Qualcomm Single Chip™ (QSC™) QSC7230™ and QSC7630™. The MDM8200, primarily targeted for data cards and USB modems, and the QSC7230 and QSC7630, targeted for mass market smartphones, will support the 2.6GHz band as well as existing HSPA/HSPA+ bands. Qualcomm's OEM customers are expected to launch end-user devices based on these solutions starting in the second half of 2009. Operator trials of 2.6GHz OEM devices may start earlier in 2009.

Qualcomm supports ComReg's plans to formulate a coherent strategy to facilitate the development of 3G services in the 2.6 GHz plan. Qualcomm urges ComReg to adopt the 2.6 GHz European harmonized band plan as set in ECC DEC (05)05 (2x70 MHz FDD and 50 MHz TDD). Indeed irrespective of what technologies or services that may be deployed, a common and harmonized band plan reduces the risks of interference and facilitates economies of scale, which in turn brings benefits to consumers and citizens. Other countries in Europe such as Germany and Sweden acknowledged those benefits and decided to adopt the ECC(05)05 harmonized band plan for the 2.6 GHz band.

3. Mobile TV / Mobile Multimedia

Qualcomm highly welcomes ComReg's proposed strategy to seek to license mobile multimedia services in the UHF band. Qualcomm further believes that this licensing should be done as early as possible, since as correctly noted by ComReg; there is a market demand for Mobile TV in Ireland. Qualcomm will be contributing to the upcoming ComReg's consultation on the license conditions which could be applied to mobile TV. In the mean time, Qualcomm would like to put forward the following views:

- Mobile TV is considered today a nascent and evolving new service which will benefit from competition and economic drivers. Service regulation as well as spectrum management will have an important role in creating a robust framework and incentives for stakeholders to invest in this new service.

- The Mobile TV regulatory framework should be competitive, flexible and innovative based on the essential principle of technology neutrality. This will arm players with more flexibility and consumers with more choices at affordable price. In the area of spectrum allocation, predictability and efficient use are of critical importance.

- With regards to the *general framework*, we believe the Mobile TV should be considered as a new "digital multimedia service" as opposed to an extension of traditional television services. It should be subject to a dynamic regulation based on market specificities preferring ex-post competition rules. It should be applicable and open to all actors in order to drive investments and consumer benefits.

- In relation to the *authorisation regimes*, clear and predictable usage rules for such license need to be provided in order for future Mobile TV market investors to assess their risks and the future return on investment. In particular, a long term national license (network and services) subject to a single authorization is favored as it would avoid "throwing" multiple layers of regulations on this new medium. As the Mobile TV market is nascent and will require significant investments for the build-out of networks, it is important to adopt well in advance clear, transparent and flexible rules, including rights and obligations attached to the spectrum licensing process and open the application to any new entrants willing to make the necessary investment commitments.

- In relation to the *award regimes*, as mentioned above, we believe that the Mobile TV service will benefit from a legal procedure involving the award of a single national spectrum license for the service delivery, the operation of the platform and the deployment of the transmission network. This award should provide a healthy and open competitive environment, conducive for investments toward the provision of a high quality mobile multimedia broadcast offering.

- In relation to *specific conditions*¸ no unnecessary ex-ante regulations should apply to mobile TV including must-carry rules, advertising, content programming, or specific revenue models. Related to the service, content rights, network security, minors'

protection and human dignity as well as individual privacy remain essential and relevant to the mobile TV field.

4. **The UHF Digital Dividend**

ComReg is seeking views in its proposed Draft Strategy on the approach that should be taken to releasing the digital dividend and possible applications that should be taken into account in order to best utilize the spectrum.

Qualcomm believes that it is of utmost importance that the mobile and audiovisual industries are given new opportunities arising from the availability of new radio frequencies, particularly in the UHF band, providing public service and interference requirements are respected. In terms of policy options, Qualcomm considers that:

- The digital dividend that will result from analogue to digital TV switch over and analogue switch off will enable the cost efficient deployment of a range of innovative and convergent audiovisual and telecoms services such as Mobile TV, 3G and LTE.

- The decisions on the Digital Dividend are not just related to technical considerations but profoundly related to the political, industrial and economical ones.

- The upper part of the UHF spectrum, in the 700/800 MHz range, is the sweet spot for the deployment mobile applications taking into account handsets design constraints and performances.

- Taking into account the decisions that have been made in various countries globally, a digital dividend of around 100 MHz is a realistic target for Europe and will bring the outmost benefits in terms of economical and social value.

- WRC-07 allocated the sub-band 790-862 MHz for mobile services and identified it for IMT services. The sub-band 790-862 MHz constitutes therefore a excellent first step for the harmonization of the digital dividend in Europe.

- The UHF Band segmentation based on services clusters, as proposed by the Commission in its Communication on the Digital Dividend (November 2007) enables the most efficient use of spectrum, innovation and investments, which are all benefits for the European Consumer.

- Qualcomm undertook an analysis on the impact of a fragmented Digital Dividend on handsets technical design and cost. Our conclusion is that the harmonization of the Digital Dividend in Europe is a must in order to reap the full benefits of this spectrum and achieve the required economies of scale. As an example, Figure 1 shows the implementation impact of 3 different Digital Dividend band plans compared to one harmonized band plan on handset design and cost.

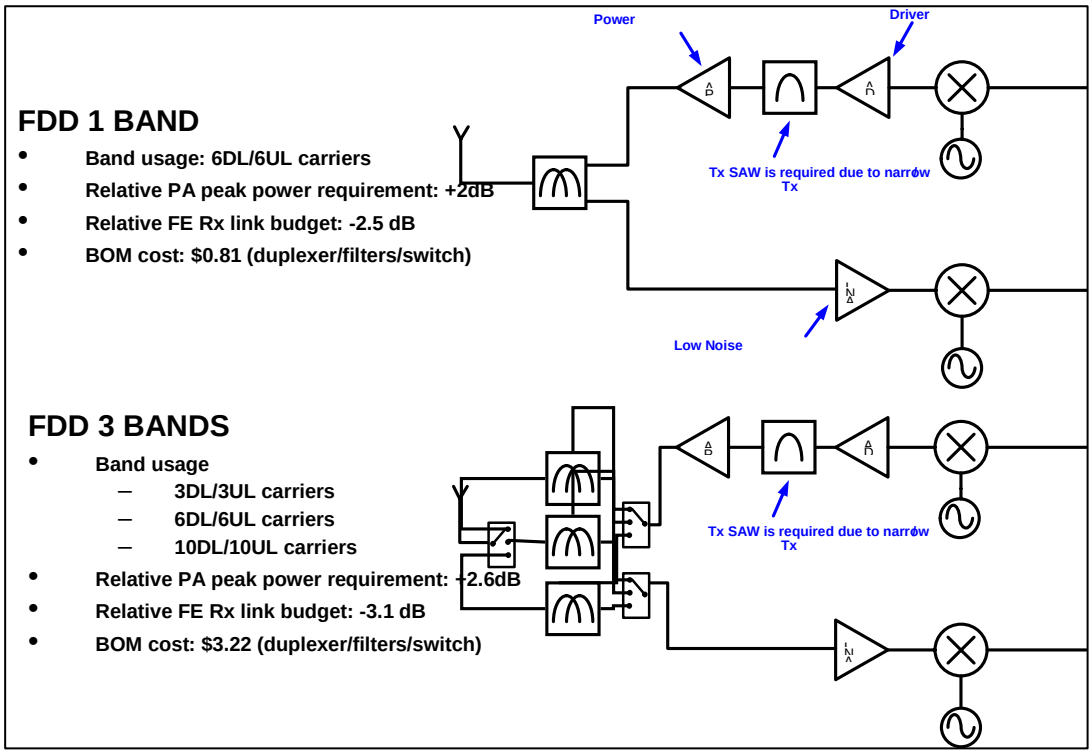

Figure 1: Impact of spectrum harmonization on the mobile terminal design and cost. Source: Qualcomm

- The Digital Dividend mobile broadband band plan which will support 3G and LTE should be harmonized and be based on FDD (Frequency Division Duplexing) or HD-FDD (Half Duplex FDD). The TDD (Time Division Duplexing) option does not enable the deployment of cost efficient wide area / large coverage mobile networks and would therefore not be suitable for the UHF Digital Dividend

- In order to enable location based services using Galileo, mobile emission in the Digital Dividend shall be located above Channel 60 (787.71 MHz). This can be ensured by a band plan based on FDD and HD-FDD with reversed uplink and downlink directions.

5. Approach to Licensing Fixed Services, the 450 MHz band

Qualcomm agrees with ComReg's views that the 450 MHz spectrum is ideally suited for the provision of mobile, especially mobile broadband to rural areas, due to its propagation characteristics. In addition, the 450 MHz band has been recently identified by WRC-07 globally for IMT-2000 services, which consolidate the suitability of this band for supporting mobile broadband services. Qualcomm therefore concurs with ComReg's proposal to close the band to new fixed link applications and to move over the next three years all remaining links out of the band, in view of changing its future allocation and making it available for new mobile services.

17 SES

Ms. Sinead Devey
Commission for Communications Regulation
Irish Life Centre
Abbey Street
Freepost
Dublin
Ireland

May 2, 2008

Comreg Consultation on:
Proposed Strategy for Managing the Radio Spectrum: 2008-2010

Dear Ms. Devey:

SES S.A. ("SES") is pleased to participate in the above-mentioned Consultation undertaken by ComReg with respect to the Irish strategy for radio spectrum over the next years. Please allow us to introduce SES before entering into our more detailed comments on the Consultation.

About SES

SES is a global satellite management company, headquartered in Betzdorf, Luxembourg. SES owns three market-leading satellite operators, SES ASTRA in Europe, SES AMERICOM in North America, and SES NEW SKIES which provides global coverage and connectivity.

SES ASTRA is the leading Direct-to-Home (DTH) satellite system in Europe. The satellite fleet currently comprises 13 ASTRA and two SIRIUS satellites. The combined satellite system delivers services to more than 117 million DTH and cable households and transmits a total of 2,295 analogue and digital television as well as radio channels. SES ASTRA also provides satellite-based multimedia, internet and telecommunication services to enterprises, governments and their agencies. With 31 High Definition (HD) channels available via its satellites today, ASTRA and SIRIUS represent the most important HDTV broadcasting platform in Europe. The prime orbital positions for ASTRA and SIRIUS in Europe are 19.2° East, 28.2° East, 23.5° East and 5° East. According to the latest market data, more than 900,000 Irish households receive TV programming via the 28.2° East orbital location.

SES ASTRA also holds a 50% interest in SOLARIS Mobile Ltd, a joint venture focusing on providing mobile satellite services in the 2GHz MSS band.

Additional information on SES and SES ASTRA are available at: www.ses.com and www.ses-astra.com, respectively.

SES Comments to the Public Consultation

SES would like to congratulate ComReg on this comprehensive analysis of the spectrum situation in Ireland and beyond, and on the proposed strategies. With respect to the chapters related to satellite services, we would like to offer the following comments:

- ComReg does not appear to attempt to quantify the economic benefit (based on GDP + employment contributions) of satellite services as a whole, but only in respect of satellite pay TV (Section 7.3.4). We believe that it would be beneficial to broaden the analysis of the benefits of satellite services not only in terms of the direct employment and GDP contribution, but also in terms of the benefits of media diversity, development of broadband access, and other policy objectives. We believe that such a broader analysis would provide a fairer picture of the satellite sector's benefits to the Irish society. SES would be pleased to enter into more detailed discussions with ComReg on this matter;

- As to the questions raised in Section 7.9 (satellite services), we would comment as follows:
    1. "Responding to requests for frequency coordination involving satellite services in such a manner as to ensure *equitable access* to the radio spectrum for both satellite and terrestrial services which share the same or adjacent frequency bands on the basis of applicable national and international regulations." In this regard, it is to be reminded ComReg intends to implement the EC Decision on BWA in 3.4 – 3.8 GHz. We believe "equitable access" should involve recognition and protection of satellite earth stations operating in that band. And we note that "applicable international regulations" limit mobile to secondary status in the part of that band above 3.6 GHz. ComReg should be more explicit about these constraints in its proposed spectrum strategy.

2. "Contributing to the current EC initiative to licence a European wide MSS and the subsequent demand for CGC in support of that satellite network" – a more specific response is provided separately by SOLARIS Mobile Ltd;

3. If ComReg's strategy is to react "positively to proposals for deployment of satellite-based services in Ireland", and if ComReg recognises the importance of satellite DTH broadcast services for the Irish society (as it is clear from Section 7.3.4), it follows that terrestrial services which may share the same Ku band spectrum should not only coordinate with DTH uplink stations, but also protect the un-registered consumer receiving stations.

4. "Developing an authorization regime for the CGC of MSS networks" – a more specific response is provided separately by SOLARIS Mobile Ltd;

We would like to thank you for the opportunity to express our views on the proposed spectrum strategy, and remain at your disposal for any questions you may have in connection with this contribution.

Yours sincerely,

W John Purvis
SVP & General Counsel
SES

18 Solaris Mobile Ltd

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2no May 2008

Ms. Sinead Devey
Commission for Communications regulation
Irish Life Centre, Abbey Street
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Dublin 1, Ireland

Comreg Consultation on:

Proposed Strategy for Managing the Radio Spectrum: 2008-2010

Dear Ms. Devey,

SOLARIS Mobile Ltd ("SOLARIS Mobile") is pleased to participate in the above-mentioned Consultation undertaken by ComReg with respect to the Irish strategy for radio spectrum over the next years. Please allow us to introduce SOLARIS Mobile before entering into our more detailed comments on the Consultation.

About SOLARIS Mobile

SOLARIS Mobile Ltd is a recently established satellite operator, based in Dublin. SOLARIS Mobile is a 50/50 joint-venture of two world-class satellite operators (SES ASTRA S.A. and Eutelsat S.A.) focusing exclusively on commercialising mobile satellite services (MSS) in the 2GHz band within Europe, Middle East and Africa. The 2GHz frequency spectrum enables a number of innovative applications, including mobile TV and interactive applications for both handheld and vehicular devices. A smart combination of space and terrestrial network infrastructures allows both operators and customers to combine the best of both worlds: wide geographic and population coverage and high capacity.

After careful comparison of different options, SOLARIS Mobile chose to establish in Ireland because of the business-friendly environment, the availability of highly skilled people and the excellent connections across Europe. The presence of a new satellite operator based in Ireland offers a wide range of opportunities also for other high-tech companies: developing innovative mobile products, applications and services, state-of-the-art research and development, etc."

SOLARIS Mobile comments to the Public Consultation

SOLARIS Mobile would like to congratulate ComReg on this comprehensive analysis of the spectrum situation in Ireland and beyond, and on the proposed strategies. We are pleased to offer the following comments to questions 2 and 4 raised specifically in Section 7.9:

2. "Contributing to the current EC initiative to licence a European wide MSS and the subsequent demand for CGC in support of that satellite network": Although not specifically referred to in the introduction in 7.9, we presume this refers to the draft Art.95 Decision under review at the Council and European Parliament. We would suggest a more specific wording such as "Contributing to a timely adoption and rapid execution of an EC initiative to establish a Community procedure for the common selection of operators of mobile satellite systems as well as to lay down provisions for the coordinated authorisation by Member States of the selected operators to use radio spectrum for the operation of mobile satellite systems, including complementary ground components";

4. "Developing an authorisation regime for the CGC of MSS networks" - Again, we presume this relates to the MSS 2GHz harmonisation process, and we would suggest a different wording "Developing appropriate authorisation regimes, in line with the Community procedure being established, for MSS networks in the 2GHz Band as well as for the associated CGC networks in order to be able to authorise such electronic communications networks as of the end of 2008". This underlines the urgency of the matter, and the fact that appropriate regulations are to be developed for both MSS and CGC in this frequency band;

We would also like to point out that any Irish and European legislation should take into account the legitimate expectations of players, such as SOLARIS Mobile, who made certain investment decisions when the regulatory framework was different.

We would like to thank you for the opportunity to express our views on the proposed spectrum strategy, and look forward to explaining in more detail our plans for the development of Solaris Mobile and, specifically, the issues that lie behind this contribution.

Yours sincerely

Steve Maine

Chief Executive Officer
SOLARIS Mobile Ltd

19 SEARG

Proposed Strategy for Managing the Radio Spectrum: 2008 – 2010

ComReg Document no 08/20 6th March 2008

Response from the South Eastern Amateur Radio Group (SEARG)

Background

The South Eastern Amateur Radio Group is a non-profit organisation based in Waterford city in the South-East of Ireland which caters for those with an interest in amateur radio experimentation.

We currently have members in Counties Carlow, Kerry, Kilkenny & Waterford with interests in a wide range of aspects of radio experimentation including SSB, CW, Satellite Operation, Packet, VHF, ATV, Voluntary Emergency Communications (AREN), Digital Modes, APRS and Repeaters.

The group is affiliated to the Irish Radio Transmitters Society (IRTS)[1] The national society for Ireland of the International Amateur Radio Union (IARU). Quite a few of our members are also active in the Amateur Radio Emergency Network (AREN)[2].

We maintain and operate a number of voice repeaters in the South East that constitute part of the 'Southern Ireland Repeater Network' which is run co-operatively between us and the East Cork Radio Group (EI7M).

Our meetings take place in Roanmore Social and Sports Centre, Cleaboy Road, Waterford at 8.00 p.m. on the last Monday of each month. Our committee meetings take place at the same location on the first Monday of each month.

Section 6.3.6

This section mentions that new legislation relating to the regulation of the electronic communications sector will be introduced. It is hoped that any new legislation will not in any way have an impact on the services SEARG currently offers to members. SEARG is also fully supportive of AREN activities and would hope that no proposed changes would have a negative impact on the capability of radio experimenters to pursue their technical investigations and to participate in AREN activities. It is hoped, at a minimum that at the time of the preparation of the legislation, our representative body, the IRTS will be consulted on the matter.

Section 7.11

SEARG welcomes what is set out in this section but we feel that several important items have been overlooked:

- The returning in Region 1, of the 7.1 to 7.2 Mhz frequency segment to a primary allocation for the Amateur Service.

1 http://www.irts.ie
2 http://www.aren.ie

- The proposed 3Khz channels in the 5MHz spectrum.
- The general release of the 4m (70Mhz) band.

We feel that the timely and successful completion of these outstanding issues may be worth mentioning. Also, nowhere is the "self-training" aspect of the hobby, nor ongoing "technical investigation" mentioned. It is a commonly held view that these are fundamental tenets on which the hobby is based, and it is acknowledged that many professionals in the area of communications and electronics had some exposure to the hobby before making a final career choice. Indeed many of our members would not be in their chosen careers were it not for the influence of Amateur Radio.

20 Swiftcall

1 May 2008

Reference: Submission re: ComReg 08/20

Swiftcall Ireland welcomes the opportunity to submit comments on ComReg's Proposed Strategy for Managing the Radio Spectrum: 2008 - 2010. (ComReg 08/20)

Swiftcall is interested in acquiring a licence for the 2010-2025 MHz spectrum to roll out a national wireless mobile broadband network utilising TD-CDMA technology. We welcome ComReg's indications that a consultation process for this spectrum is currently planned for late 2008 and we are currently running a Trial of the technology under ComReg's Test and Trial Licensing Regime. Swiftcall formally requests ComReg to endeavour to release this spectrum as soon as possible.

Swiftcall encourages ComReg to release this spectrum in a single block on a national basis to facilitate roll out of a high capacity mobile broadband network and stimulate increased competition in the mobile broadband market in Ireland. It is Swiftcall's opinion that the licence should be granted on a long-term basis that will allow sufficient time for the successful applicant to secure a return on their initial network investment.

We believe that the competition to award a licence for this spectrum should consider some element of "beauty contest" that will ensure that the spectrum is quickly utilised in a manner that delivers services of value to the market in a reasonable time frame. This could be used as a means of pre-qualifying applicants ahead of a multiple round auction (if there is sufficient interest in this spectrum) and Swiftcall believes that this approach could be used while retaining the desired elements of a service & technology approach.

Yours sincerely,

Ciarán Rooney
Business Development Manager
Swiftcall Long Distance Ltd.

21 UPC

Ms. Sinead Devey
Commission for Communications Regulation
Irish Life Centre
Abbey Street
Dublin 1

May 7th, 2008

Dear Ms Devey

Please find enclose UPC Ireland's confidential response to the recent ComReg consultation on its proposed strategy for managing Radio Spectrum from 2008-2010.

Yours sincerely

Kate O'Sullivan
Director Regulation & Public Policy

UPC Ireland
kosullivan@upc.ie

UPC Communications Ireland Ltd. (UPC Ireland) response to ComReg's proposed Strategy for Managing the Radio Spectrum 2008-2010

General Introduction

1. UPC Communications Ireland Ltd. (UPC Ireland) welcomes the opportunity to comment on ComReg's 'Proposed Strategy for Managing the Radio Spectrum: 2008-2010' (the 'Document').

2. As a current user and potential future investor in services offered in the 2500-2690 and 2300-2400 bands, issues raised in the Document are of direct relevance to the company's current and future investment strategy.

3. In particular issues raised in relation to the continued and more importantly, alternative use of services in the 2500-2690 band are of immediate concern to the company.

4. Indeed as an existing provider of services in this frequency band, we are concerned with inferences that ComReg foresees use of this spectrum for 3G and will seek to "accommodate any ongoing requirement by MMDS providers and their customers". This infers that ComReg is contemplating the introduction of alternative services in this band which would clearly require the phasing out of MMDS services. If this case, UPC Ireland would request immediate engagement and dialogue with ComReg to clarify its thinking, since if correct, these proposals will have an immediate impact on decisions, currently being taken for our future investment roadmap. From a business investment perspective, current plans to provide feedback over the next the coming 12-18 months is unreasonable since commercial decisions impacting investment in the business will have occurred before then.

Overview of existing operations in the 2500-2690 frequency band

5. UPC Ireland currently holds MMDS licences under the name of ntl Communications (Ireland) Limited ("ntl") and Chorus Communications ("chorus").

6. Under the terms of these Licences and subsequent Licences bringing these in lines with the 2003 Regulations, ntl and Chorus were granted the use of the frequency band 2500 – 2676 MHz until January 1, 2005 and the use of the frequency band from 2524 – 2668 MHz from January 1, 2005 onwards for the provision of MMDS services.

7. [redacted].

8. In late 2002, ntl's licence term was reduced by two (2) years to April 19, 2012 pursuant to regulation 18(3) of the Wireless Telegraphy (Programme Services Distribution) Regulations 1999 (SI No. 73 of 1999) (the "1999 Regulations") for failure to comply with a licence condition relating to the full digitisation of the ntl network. This digitisation was subsequently completed in 2004.

9. This therefore means that ntl currently operates under a licence that is due to expire in April 2012 while chorus has a licence that runs until April 2014. UPC Ireland has in the past formally requested ComReg consider harmonising the term date of both Licences to 2014 – a request that is still outstanding.

Past and future investment plans in UPC Ireland's MMDS footprint

10. Liberty Global Inc. (LGI), the parent company of UPC Ireland, became the owner of chorus in 2004 and ntl in 2005. Since that time, the company's efforts and financial investment has been focussed on upgrading the respective networks while at the same time merging two formerly separate businesses into one national operator.

11. From a network management perspective, since acquisition, we have achieved a number of significant milestones including migration of all regional head-ends into one national head-end located in Goldenbridge and the construction of a high capacity national optical backbone linking the 5 major cities as well as upgrading our microwave backbone which serves our MMDS transmitters as well as completion of the digitalisation of the chorus MMDS network.

12. From a commercial perspective we have significantly enhanced our product offerings across our video, data and voice services with the most recent and probably most innovative relating to the launch of our digital telephony product. We are now rolling out a new range of digital Set Top Boxes with embedded EuroDocsis Cable Modem. There is also a Personal Video Recorder (PVR) in the range which offers a new experience in "time shifting" to our video customers.

13. All this to demonstrate and, as indicated in various presentations given to ComReg over the recent past, LGI is investing massively in its Irish subsidiary. While work is far from complete, the company is on track to meeting its ambitious product and network upgrades which brings the possibility of ultra high speed broadband , (- currently being rolled out in other LGI affiliates) as well as the ability to run Video on Demand and other exciting interactive services.

14. Specific to the MMDS platform and therefore to the nature of the requests outlined further, earlier this year we announced we had completed the digitisation of that network – the result of a several million euro investment. The former chorus network currently offers up to sixty digital channels with plans to offer an additional twenty in the near term while the former ntl network has over a hundred TV and radio channels including a full suite of premium services.

15. [redacted].

16. [redacted].

17. In short UPC Ireland is committed to continued investment in its MMDS platform, however requires advance dialogue with ComReg prior to undertaking further investment in this platform.

Specific Questions raised in the Document:

Which approach should ComReg take in licensing the various spectrum bands ? (Ref: Sections 7.2.2)

UPC Ireland feedback on ComReg's approach on existing Licences

18. UPC Ireland believes ComReg's strategy on Spectrum Management should not only focus on future use of spectrum bands but needs to also take account of existing users of allocated frequencies. We understand it is ComReg's intention to engage with all interested parties including current users of certain frequency bands, however from UPC Ireland's perspective this is not something that can wait to be decided over the next 12-18 months. From the company's perspective we are keen to commence this dialogue as a matter of urgency since outcome of that debate will have an immediate impact on investment plans by the company.

19. With regard to ComReg's current approach on existing Licences, UPC Ireland is still awaiting feedback on a number of outstanding requests in relation to terms of its MMDS Licences. Outlined in correspondence dated June 25, 2007 ([redacted]) a summary of these requests is as follows:

    a. Will ComReg agree to harmonising all UPC Ireland MMDS licences to 2014 ?

    b. Will ComReg consider reallocating the four (ntl) channels removed in 2005 to licences cover the 2500-2676MHz frequency range ?

    c. Would ComReg agree to concessions to allow two-way services on the existing MMDS licences?

    d. When does ComReg expect to be in a position to inform UPC Ireland whether or not existing licences will be renewed (or indeed when will it be in a position inform licensees of future use the MMDS spectrum frequencies)?

UPC Ireland feedback on future strategy for Frequency Bands 2500-2690 and 2300-2400Mhz

20. As a current user and future investor in services offered in the 2500-2690 band, any discussion relating to continued or more importantly, alternative use of services in this spectrum band is of direct concern to UPC Ireland.

21. Inferences in the Document that this band could designated for 3G use in the future and in separate offline discussions with ComReg where it indicated it was currently considering issuing a 4G trial licence in the same band strongly hints that ComReg is not only not considering to extend our MMDS licences but that it is considering opening up the band to alternative services.

22. We note the draft European Commission Decision of April 2, 2008 which once finalised (expected May 2008) will be binding on member states six months after publication[1].

23. The draft Decision which presumably has the support of all member states calls for a technology neutral approach for services to be provided in this spectrum band. The draft Decision states this [technology neutral] "*policy goal should not be introduced abruptly but in a gradual manner to avoid disruption of the market and services provided should mainly target end-user access to broadband communications".*

    a. Further to the above, UPC Ireland would make the following observations :

        i. National Regulators have total independence and considerable latitude (management of interference notwithstanding) in determining which services should be provided in the 2500-2690 frequency band.

        ii. The emphasis on technology neutrality would infer that future allocation of the 2500-2690 band to IMT -2000 UMTS systems is not a foregone conclusion and indeed exclusivity in use of this band for these services is not a given.

        iii. UPC Ireland's current ComReg Trial which tests the offer of two-way services to our MMDS base (by using the return path in the 2300 -2400 Mhz band) would seem to support the EU's policy objective to extend the offer of services in the 2500-2690 Mhz band to include broadband access services. The Trial, which has been hugely successful, clearly demonstrates that UPC Ireland, subject to a concession on its MMDS Licences, could offer such services to its MMDS customer base.

        iv. The grant of such a concession would appear not only to be within ComReg's gift but is consistent with EU and Irish government policy (whose currently focus is on increasing broadband penetration rates particularly in rural Ireland).

1 http://ec.europa.eu/information_society/policy/radio_spectrum/docs/ref_docs/rsc23_public_docs/rscom08-02.pdf

Within what timeframe do you consider that ComReg should make various spectrum bands available ?

24. Before ComReg considers when it would be appropriate to make various bands available, it is imperative it consults with existing providers to understand their current business models and future investment plans. UPC Ireland holds Licences due to terminate in 2012 and 2014. We understand ComReg has no statutory obligation to provide any feedback as to its plans for extension or non-renewal of those Licences until few years in advance of their current term however from a business perspective UPC Ireland requires as much advance notice as possible in order to be able to make informed decisions on future investments. UPC Ireland will already mid-2008 take decisions in relation to future investment in the MMDS franchise areas that currently have a due date of 2012. The business reality is therefore that the company requires dialogue well in advance of the suggested 12-18 month timeframe since commercial decisions are continuously taking place and certainly will be taken before ComReg's own planned timetable.

22 Vodafone

Strictly Confidential

Vodafone response to the ComReg Consultation on the Proposed Strategy for Managing the Radio Spectrum: 2008-2010

INTRODUCTION

Vodafone welcomes the opportunity to respond to this consultation on ComReg's proposed strategy for managing the radio spectrum for the period 2008-2010. As the analysis of the economic impact of spectrum usage included in the ComReg consultation document shows, spectrum is a critical natural resource which makes substantial contributions (both direct and indirect) to Ireland's society and economy. It is therefore vital that the management of the radio spectrum is optimised so that spectrum is allocated efficiently to those uses that provide the greatest economic and social benefit to society. Our views in relation to the details of ComReg's proposed spectrum management strategy are set out in full in the subsequent sections of this consultation submission.

General Approach to Spectrum Management

Spectrum reform, and in particular liberalisation of rights of use, is vital to maximise the economic and social benefits for end users from use of the valuable spectrum resource. Vodafone therefore supports ComReg's proposed strategies, as set out in section 6.4 of the draft strategy document, to increase flexibility in the use of spectrum, subject to harmonisation and interference protection requirements being met. Technology neutrality and service neutrality should be implemented in spectrum licence conditions as far as practical. In this regard the adoption by ComReg of the WAPECS initiative is appropriate and this approach should be further extended and developed together with implementation of any amendments to the provisions relating to spectrum reform that may be introduced arising from the current review of the EU Regulatory Framework.

Vodafone agrees with ComReg's proposals to increase the utilisation of market mechanisms in assigning spectrum as this will maximise the likelihood that spectrum will be allocated to its most efficient uses and, for a given use, will be allocated to the user or users that value it most highly. The introduction of secondary trading of spectrum usage rights would also generate additional efficiency benefits in many spectrum bands as it would internalise, at least for commercial users, the opportunity cost of their existing use of the spectrum. This would create strong incentives for existing licensees to take the necessary technical and investment decisions to use their spectrum allocation optimally, allowing them to transfer unused or underused portions of their spectrum allocations to other spectrum users.

It is Vodafone's view that while both increased flexibility of use of spectrum and secondary trading are necessary elements of spectrum reform, the bulk of the potential gains that can be realised from reform would arise from liberalisation of the constraints on spectrum rights of use. Increasing flexibility of use of spectrum should therefore be prioritised by ComReg in its spectrum management strategy.

Vodafone notes ComReg's proposals to release additional spectrum in a range of bands in the period to 2010. Additional spectrum should be released where this is required to meet demand for the provision of services of significant economic and social value. A comprehensive analysis to determine the extent and nature of the demand for use of the spectrum must be conducted by ComReg in all cases prior to any decision regarding the release of a particular spectrum band being taken. The analysis should fully consider the merits of alternative options to satisfy spectrum demand, such as the possibility of providing at least some the required spectrum through a more efficient re-allocation of spectrum that is already being utilised. This is particularly important where the demand for spectrum is primarily for the provision of services of very high economic and social value, as the benefits could be maximised where these services would be provided in already utilised spectrum with favourable signal characteristics. Relevant examples in this regard are the

prospective re-farming of 900 MHz spectrum for use by 3G mobile services and the significant opportunities presented by the Digital Dividend.

Liberalisation of the GSM Spectrum Bands

Vodafone welcomes ComReg's proposal to initiate a public consultation on the liberalisation of the 900 MHz and 1800 MHz bands and intends to participate in the future consultation process on this issue. It is appropriate at this juncture for ComReg to consider the available options for ensuring the efficient use of this spectrum, however it is imperative that any proposals for the assignment of currently unallocated spectrum in the 900 MHz and 1800 MHz band are based on objective, transparent, and proportionate criteria.

Refarming is the most effective measure that can be taken in the short term to achieve greatly increased spectral efficiency in the 900 MHz and 1800 MHz bands given that UMTS uses spectrum 3-5 times more efficiently than GSM. UMTS 900/1800 refarming, by increasing the flexibility with which spectrum is used, will also represent a significant step in the transition toward technology and service neutrality consistent with the WAPECS concept.

In terms of consumer and societal welfare, UMTS 900/1800 refarming has the potential to offer enormous benefits by allowing mobile operators to respond efficiently and flexibly to the increasing and changing needs of customers. Demand from Vodafone customers for services such as high speed access to the internet and the downloading of value added content from handsets and other wireless enabled devices has been increasing rapidly and will continue to grow strongly for the foreseeable future. This has been reflected in a rising share of mobile traffic moving from the GSM network to the UMTS network. Other Irish MNOs are also experiencing rising traffic on their UMTS networks. This trend will enable the freeing up of part of the GSM spectrum for use for UMTS services without a disruption in the quality of service for existing GSM customers.

Refarming will allow Vodafone and other MNOs to reuse to a considerable extent our existing base station sites. This will reduce the requirement for additional sites to meet growing demand for the new 3G services in areas of existing coverage owing to the greater efficiency with which spectrum in the GSM bands can be used. There will also be a resulting greatly reduced requirement for new sites needed to build out the network, particularly in less populated areas, making it economically viable to provide coverage to a larger percentage of the population and national territory than would otherwise be possible. The implementation of refarming could thereby contribute significantly toward addressing Digital Divide issues, increase value and choice for consumers, and accelerate the adoption of 3G services by the market.

Environmental benefits that would arise from spectrum refarming would represent a considerable positive externality for society. Although not readily quantifiable, the reduced requirement for additional base station sites would minimise visual intrusion and avoid the energy consumption involved in construction, maintenance, and operation of the extra sites that would otherwise be necessary to extend and improve coverage. The provision of 3G services such as mobile broadband to additional areas of the country, and improved provision in areas already in coverage, would also expand the options for remote working and thereby contribute to reducing problems such as traffic congestion and carbon emissions.

In view of the considerable advantages to be gained from UMTS 900/1800 refarming as set out above, any significant delays in implementation would result in significant lost consumer and industry benefits. Vodafone supports the earliest possible formal repeal of the GSM directive and considers that preparations for refarming by both industry and ComReg should be advanced in a

timely manner. Discussions have already been initiated in industry forums to seek to develop an agreed approach on the process by which refarming can be effected and ComReg's proposed public consultation on the liberalisation of the GSM bands should further progress these deliberations.

Vodafone considers that the approach to refarming, as a first priority, must ensure that the process is organised so as to avoid significant disruption to the use of existing services currently provided in the 900 MHz and 1800 MHz spectrum. Given the millions of customers reliant on mobile voice and data services delivered using these bands, and the importance of continuous high quality availability of these services to their welfare, all reasonable measures must be taken to allow refarming to be achieved seamlessly.

The most efficient use of spectrum at all stages should also be a guiding principle in determining the optimal approach to the implementation of refarming. In this respect Vodafone believes that the requirements of those mobile operators that are the most efficient users of spectrum, most intensively using their existing spectrum allocations to meet the demands of their customers, should be the focus of particular attention. The adoption of this principle should lead to the development of a refarming process that provides the identified benefits to the largest possible number of mobile customers at the earliest stage.

Digital Dividend Spectrum

The spectrum to be released in the UHF band as broadcasters complete digital switch-over provides an exceptional opportunity to extend and enhance the provision of mobile broadband services. These benefits would be incremental to any benefits arising from UMTS 900/1800 refarming or from the use of other appropriate spectrum, such as the 2.6 GHz band, to increase the capacity to meet customer demand for mobile broadband.

UHF spectrum has excellent propagation and coverage characteristics that would allow mobile operators to provide mobile broadband coverage with fewer base stations (and therefore at lower cost). This would enable mobile operators to offer cheaper mobile broadband services, accelerating their take-up and enhancing their value to consumers. It is also likely that there would be quality improvements in service provision, such as increased in building coverage, arising from the superior signal characteristics of UHF spectrum relative to the other spectrum bands that are currently used, or are likely in future to be available, for delivery of mobile broadband services.

The allocation of at least some of the Digital Dividend spectrum to mobile operators would clearly significantly increase consumer welfare and generate substantial economic value for the economy. A recent independent report produced by Spectrum Value Partners (included with this submission) has conservatively estimated that allocating some UHF spectrum to mobile operators would generate a net present value of benefits of at least €63 bn for Europe. This represents additional value over and above that generated if the same amount of spectrum were used for the broadcasting of additional TV channels.

In addition to the economic value that would be generated by the provision of mobile broadband services using UHF spectrum, substantial social benefits would also arise. Social value would arise in particular from the potential to provide broadband to a greater proportion of the population than currently. The lower costs involved in mobile broadband service provision using UHF spectrum would allow mobile operators to efficiently increase coverage to include many areas where it is not currently feasible to provide service. This could make a major contribution to addressing Digital Divide concerns as mobile broadband would potentially be available in areas where it would not be

economically viable to roll-out fixed broadband. Even in areas where fixed broadband is already available, competition and consumer choice in many areas would be enhanced by the emergence of a mobile broadband option for consumers.

Further benefits to society from facilitating mobile broadband service provision using UHF spectrum would arise from the increased mobility and productivity gains afforded by having mobile broadband available in areas that would not otherwise be covered. Although these are difficult to quantify, they would certainly be significant. Environmental benefits that would arise from using UHF spectrum for the provision of mobile broadband would represent a considerable positive externality for society. The reduced requirement for additional base station sites would minimise visual intrusion and avoid the energy consumption involved in construction, maintenance, and operation of the extra sites that would otherwise be necessary to extend and improve coverage. The provision of 3G services such as mobile broadband to additional areas of the country, and improved provision in areas already in coverage, would also expand the options for remote working and thereby contribute to reducing problems such as traffic congestion and carbon emissions.

While enormous benefits would result from the allocation of at least some Digital Dividend spectrum to mobile operators, Vodafone recognises that broadcasting services currently provided using UHF spectrum, and to be provided in this band in future using DTT, are of high economic, social, and cultural value. The key challenge is to ensure that the spectrum released by the Digital Dividend is allocated between mobile services and broadcast services optimally so that welfare is maximised. Finding the right balance will involve looking at the trade-offs between broadcast and mobile services at the margin. There is undoubtedly a requirement for spectrum on the part of public service broadcasters to achieve specific general interest objectives, however it would be a sub-optimal outcome if the spectrum allocated to broadcast use were to exceed the amount strictly necessary to achieve these objectives. Vodafone believes that a comprehensive national cost-benefit analysis should be conducted to inform the decision on the appropriate allocation of Digital Dividend spectrum in Ireland and that ComReg should initiate work on developing the policy for the available Digital Dividend spectrum at the earliest opportunity.

A reasonable degree of harmonisation of Digital Dividend frequencies for mobile use on a pan-European basis is essential for service interoperability across countries to be possible and for the mobile industry to achieve the economies of scale necessary to provide competitively priced mobile broadband services to customers. Vodafone therefore supports ComReg's participation in European level efforts to identify frequencies that could potentially be harmonised for the provision of a Digital Dividend. It is highly desirable, in the interest of maximising consumer welfare, that harmonisation for efficient service provision be achieved to the fullest extent possible. ComReg must seek to ensure that Digital Dividend frequencies recommended for harmonisation for the provision of mobile services at European level should also be available for allocation for this purpose in Ireland, and released in timeframes that are broadly aligned with other European jurisdictions.

The level of likely future demand for mobile broadband services is a key factor in the determination of the appropriate balance between broadcasting and mobile Digital Dividend spectrum allocations. However, the independent studies referred to above conclude that, under the majority of plausible scenarios, allocating at least 80 MHz of spectrum (not including required guard bands) to mobile services would be most likely to maximise the additional value for the European economy as a whole.

Vodafone believes that given the likely high opportunity cost of delays in making Digital Dividend spectrum available for allocation to mobile services the necessary spectrum should be released and re-allocated by 2012, if not earlier. The cost to Europe of a 3 year delay to 2015 has been

estimated to be in the order of €20bn. However the aim should be for the necessary planning work and the process for assignment of spectrum to be implemented significantly in advance of the time when spectrum can actually be released. This would provide the necessary high level of certainty to mobile operators in planning network investment.

The 2.6 GHz Spectrum Band

We welcome ComReg's proposal in section 7.2.2 of the consultation document to consult with industry over the next 12-18 months on the optimal approach to the allocation of spectrum in the 2.6 GHz band. Vodafone wishes to participate fully in this process and will be able to set out comprehensively our views on all aspects of the issue as the prospects for demand for services such as mobile broadband, and the resulting spectrum requirements, become clearer. ComReg's proposals for the liberalisation of spectrum in the 900 MHz and 1800 MHz bands will also be relevant in determining our position, and Vodafone will be best placed to respond when these become clear. In the present submission however we set out a number of high level points that we believe should inform the approach to the 2.6 GHz band.

Vodafone strongly supports ComReg's proposed strategy, as set out in sections 6.4.1 and 6.4.2 of the draft strategy document, to implement technology neutral licence conditions as far as practical subject to the avoidance of harmful interference between users. Existing constraints on spectrum use should be liberalised as far as possible, consistent with interference protection and harmonisation requirements being met, and it is both feasible and appropriate to increase the flexibility with which spectrum in the 2.6 GHz band should be used. Specifically, Vodafone believes that ComReg should adopt a technology neutral approach to the licensing of spectrum in this band as, provided that adequate interference protection safeguards can be put in place where appropriate, users of the spectrum should have the ability to select the technology which allows the most efficient provision of services to their customers.

In addition to adhering to the principle of technology neutrality, ComReg must ensure that the arrangements for the allocation of spectrum in the 2.6 GHz band in Ireland should conform to the maximum extent possible with the European band plan. It is essential that spectrum arrangements for this band in Ireland are harmonised with those in other European countries if industry and consumers are to reap the benefits of economies of scale in equipment procurement, and if interoperability of services with other European countries is to be possible.

In regard to the method for assignment of spectrum, ComReg will have to assess the merits of the various options available in the context of national conditions and the experience of other European countries that are due to hold competitions for the award of spectrum licences in this band. Whatever licence award process ComReg chooses to adopt should however satisfy a number of basic criteria.

Firstly the method by which any spectrum licences to be made available are structured must not preclude operators from having the opportunity to apply for the amount and type of spectrum, for example paired or unpaired, that they may require to efficiently provide mobile services to customers. There may be a basis for a quantitative limit on the number of licences that could be obtained by any one operator, for example to address competition concerns, but this limit should not be set at a level that would discriminate against service providers with a legitimate large requirement for spectrum.

Secondly the allocation method should make adequate provision for the need to prevent harmful interference between adjacent licensees in the context where different technologies may be applied.

Thirdly the spectrum licence award process should be no more complex than is strictly necessary to ensure that the spectrum is allocated efficiently It should be noted that the 2.6 GHz auction design proposed in the U.K. by Ofcom to be implemented later this year is significantly more complex than that used for any previous spectrum award in Europe. Vodafone has some concerns as to whether the complexity of such an award is warranted in relation to the level of the theoretical gains in economic efficiency which might result. We would therefore encourage ComReg to consider its plans for a future 2.6 GHz award very carefully in the light of the experience which the U.K., and imminently planned auctions in some other EU countries, will provide.

Fourthly, the award process should balance the necessary requirement of transparency with the need to avoid releasing information with implications for commercial confidentiality. In addition the conditions governing the rights of use of spectrum should be objectively justified, and proportionate. This list of necessary criteria is non-exhaustive but is consistent with the strategies proposed by ComReg in section 6.4.3 of the draft spectrum management strategy.

Vodafone notes ComReg's proposal in section 6.4.3 to align spectrum fees and licence duration with investment cycles so that investors can expect a fair return on investment. It would be consistent with these proposals to liberalise constraints on the use of spectrum to permit extended licence durations, both in the 2.6 GHz band and other bands, and ideally to institute licences with indefinite duration, albeit subject to adequate notice of revocation in a number of reasonable pre-defined circumstances.

Terrestrial Fixed Services

Vodafone broadly agrees with most of ComReg's proposals to increase the efficiency with which spectrum in the fixed link bands is used. The proposed actions for consolidation of spectrum in these bands should not be contentious where sufficient consultation with affected parties and reasonable notice is given. It must be emphasised however that commercial undertakings, in particular, face strong incentives to ensure efficient use of spectrum irrespective of whether regulatory measures to encourage this objective are put in place.

ComReg should exercise particular caution in any approach to the introduction of administrative incentive pricing as proposed in section 7.4.4 of the draft strategy. Administrative incentive pricing may be beneficial with regard to spectrum being used by undertakings that may be relatively insensitive to the opportunity cost of inefficient spectrum use (for example public undertakings or organisations operating on a not-for-profit basis). For users that are already using spectrum as efficiently as possible given existing technologies, administrative incentive pricing may act solely to impose additional costs that could reduce the incentives for investment and/or result in prices for retail communications services for end-users that would be higher than they would be in the absence of this policy. The appropriateness of the policy would depend on the details of how an administrative incentive pricing regime would be structured, and on the contexts in which it would be used. ComReg should publicly consult on any proposals to introduce administrative incentive pricing well in advance of their implementation. Further details in relation to Vodafone's views on administrative incentive pricing are set out further in the subsequent section of this submission relating to the use of market mechanisms.

Vodafone supports the award process for the allocation of national block licences for point to point (P2P) and point to multi-point (PMP) use in the 26GHz band that is currently underway. The current process for assignment of block licences in this band is a positive example of how a market based approach to the allocation of spectrum can be used to facilitate flexible and efficient spectrum use by communications operators.

Mobile Communication Services on Aircraft

Vodafone notes the recent press announcements from the EU Commission concerning the final adoption of an EC Decision and associated Recommendation on MCA (Mobile Communications on Aircraft). The Decision and Recommendation should provide the basis for the necessary harmonised pan European approach to the regulation of this new service.

The proposed technical conditions under which this service could be offered, such as the 3,000 metres minimum height requirement and the maximum power limits on MCA systems, are likely to limit risks of interference into ground-based mobile networks to an acceptable level. Given the largely untested nature of MCA systems however, Vodafone believes that it would be prudent for ComReg to require that licences be issued specifically for MCA services for all systems registered in this jurisdiction, rather than allowing provision of MCA solely on the basis of a General Authorisation. This would be a reasonable precautionary measure that would allow action on enforcement to be taken more easily in the event that significant interference to terrestrial mobile networks arising from the operation of MCA systems were to be identified. A licensing approach could remain in force for an interim period and could subsequently be withdrawn once it becomes clear that interference is not a significant issue.

Test and Trial Licence Scheme

Vodafone strongly supports the current test and trial licence scheme and recognises the benefits it provides in terms of encouraging innovation in wireless technologies.

Market Mechanisms in Spectrum Management

Vodafone supports the increased use of market based tools such as auctions to allocate spectrum where this is appropriate. Recent successful examples of the application of a market based approach by ComReg, for example the use of an auction in the award of national block licences in the 26 GHz band, indicate that this method should be employed more widely in future. A market based approach to assignment is particularly appropriate where demand for particular spectrum bands is likely to exceed the available supply if non-market mechanisms such as first-come first-served are used. Vodafone agrees with ComReg however that the appropriate method of awarding spectrum should be determined on a case by case basis, taking account of the details of the context. There is no one approach to assigning spectrum that is optimal in all circumstances.

ComReg concludes in section 4.3.2 of the draft strategy that secondary markets for spectrum could potentially play a role in ensuring the efficient assignment and use of the spectrum in some areas. Vodafone concurs with this view and believes that the changes in primary legislation required to permit spectrum trading should be implemented within the time period to be covered by the proposed spectrum management strategy.

Spectrum trading should be introduced gradually subject to harmonisation and interference protection considerations being adequately managed. Vodafone believes that it is essential that care is taken to elaborate property rights so that there would be enforceable restraints on interference. It is also likely to be important in any future spectrum trading regime that ComReg make available certain information to assist the smooth functioning of a secondary market in spectrum. This information - which could be published on a public database - would feature, for example, the name and contact details of licensees, frequency and geographic boundaries, current use, power emission restrictions, guard bands, any fees attached to spectrum use, and details of any sub-lessees. Without this regularly updated information, search and transaction costs could be substantial and trades that might otherwise occur would not take place because buyer and seller could not find one another.

Vodafone believes that the introduction of licences of indefinite duration would also be indispensable to the effective functioning of a secondary market for spectrum. Finite duration licences would discourage trading on the secondary market. Purchasing a licence part way through its term would leave less time to recoup investment costs. If purchasers lack assurance that they will be able to regain the licence after it expires then they will be less inclined to enter the secondary market. This effect increases as the term of the licence approaches expiry. Introducing indefinite licences would therefore greatly improve the marketability of spectrum and emphasise the opportunity cost of not using licences efficiently. Indefinite licences would allow market players to choose if and when to enter or exit the industry, and instead of facing an arbitrary cut-off date, licensees could match their licence holdings to their business plans.

With regard to administrative incentive pricing, Vodafone does not believe that there is any basis for the introduction of this policy, with the objective of encouraging the most efficient use of spectrum, in bands where spectrum trading would be possible. Spectrum trading alone would achieve ComReg's objective of ensuring the optimal use of radio spectrum. This is because it ensures that, at least for commercial undertakings, there is an opportunity cost of holding spectrum so that unused or inefficiently used spectrum will be transferred to those undertakings that value it most highly, and who would therefore be most likely to use it most efficiently for a given use. Spectrum fees greater than those required for the recovery of administrative costs would not provide any efficiency benefit over and above the incentives inherent in spectrum trading, rather such fees would act simply as a tax on spectrum users and their customers and may undermine the incentives to trade.

Assessment of Economic Impact of Spectrum Usage

Vodafone considers that the assessment of the economic impact of spectrum usage conducted as part of the development of ComReg's draft strategy gives a useful indication of the magnitude of the socioeconomic benefits resulting from usage of the national spectrum resource. The assessment of the GDP and employment contribution of public mobile services may somewhat understate the benefits created as it does not appear that the impact of independent mobile phone retailers such as Carphone Warehouse is included in the 'Mobile operators and retailers' section of Table 3. Vodafone would also note that the multiplier of 1.1 used to account for indirect impacts may be too conservative. Multipliers of around 1.4 to 1.5 have been used in other studies of this nature.

23 WiMax Forum

30th April 2008

For more information, contact:
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Reference: Submission re: ComReg 08/20

Proposed Strategy for Managing the Radio Spectrum: 2008 - 2010.

WiMAX Forum® Response

The WiMAX Forum®[1] welcomes the opportunity to provide its views and comments concerning the proposed strategy for managing radio spectrum in Ireland identified in the above public consultation document.

The WiMAX Forum is an industry-led, not-for-profit organisation formed to certify and promote the compatibility and interoperability of broadband wireless products based upon the harmonized IEEE 802.16/ETSI HiperMAN standard. A WiMAX Forum goal is to accelerate the introduction of these systems into the marketplace. WiMAX Forum Certified™ products are interoperable and support broadband fixed, portable and mobile services. Along these lines, the WiMAX Forum works closely with service providers and regulators to ensure that WiMAX Forum Certified systems meet customer and government requirements. For more information about the WiMAX Forum and its activities, please visit www.WiMAXForum.org.

In Annex 1, the WiMAX Forum is pleased to submit responses to the identified consultation document.

Yours Sincerely

Tim Hewitt
WiMAX Forum
Chair - Regulatory Working Group

[1] "WiMAX," "Mobile WiMAX," "Fixed WiMAX," "WiMAX Forum," the WiMAX Forum logo, "WiMAX Forum Certified," and the WiMAX Forum Certified logo are trademarks of the WiMAX Forum.

Annex 1

The WiMAX Forum Response:

- **General**

The WiMAX Forum is pleased to note that a core driver for the ComReg consideration of spectrum strategy refers to creating an environment that fosters innovation and that this is seen as key in delivering choice and quality services for Irish consumers. It is a key objective of the WiMAX Forum to deliver technology that drives mobile access to the internet and a compelling broadband experience on the move.

- **Section 4.4 – New Spectrum Opportunities**

The WiMAX Forum notes the potential for new spectrum opportunities in Ireland detailed in section 4.4 and in particular highlights that some of these are aligned with the certification profiles for WiMAX technology detailed in Table 1 below.

SYSTEM PROFILES	CERTIFICATION PROFILES		
	Spectrum	Duplexing	Channel Width
Fixed WiMAX (IEEE 802.16-2004, OFDM)	3.4 - 3.6 GHz	TDD	3.5 MHz
	3.4 - 3.6 GHz	TDD	7 MHz
	3.4 - 3.6 GHz	FDD	3.5 MHz
	3.4 - 3.6 GHz	FDD	7 MHz
Mobile WiMAX (IEEE 802.16e-2005, OFDMA)	2.3 - 2.4 GHz	TDD	5, 10 MHz (dual)
	2.3 - 2.4 GHz	TDD	8.75 MHz
	3.4 - 3.6 GHz	TDD	5 MHz
	3.4 - 3.6 GHz	TDD	7 MHz
	Color Key:	**Certified Equipment Available**	**Eligible Certification Profiles**

Table 1:

On February 12, 2008 The WiMAX Forum announced that 28 Mobile WiMAX products in the 2.3 GHz and 2.5 GHz frequency bands have been submitted for WiMAX Forum certification since WiMAX Forum certification laboratories began accepting applications from vendors in late 2007. The first Mobile WiMAX products have achieved the WiMAX Forum Certified seal of approval in Q2 2008. In addition, the WiMAX Forum forecasts that more than 950 products will undergo Mobile WiMAX certification testing by 2011, representing an influx of new consumer devices and infrastructure equipment to support continued rapid WiMAX user adoption in the 2.3 GHz, 2.5 GHz, and 3.5 GHz frequency bands. The WiMAX Forum's current network of six certification laboratories in China, Korea, Spain, U.S. and two in Taiwan will expand to nine with additions in Brazil, India and Japan to handle the anticipated certification demand.

- **Section 6.4.1 – Spectrum Strategy in Support of Consumers**

The WiMAX Forum fully supports the technology neutral and service neutral strategies and the potential release of further spectrum below 4GHz for broadband services taking into account the information in Table 1 above.

- **Section 7.1 - Wireless Platforms for Electronic Communication Services**

The WiMAX Forum has always fully supported the WAPECS initiative as a means to facilitate improved technology neutrality and therefore welcomes ComReg's proposals to take this into account.

- **Section 7.2.2 - Spectrum for Public Mobile Services**

The WiMAX Forum notes the reference to 3G technologies attached to the 2.6GHz frequency range and reminds ComReg that mobile-WiMAX has now been added as the 6th air interface in the ITU-R M.1457 IMT-2000 Recommendation. The WiMAX Forum would be glad to be included in any future consultation activity regarding this frequency range.

- **Section 7.2.4 - Proposed ComReg Strategy for Public Mobile Services**

The WiMAX Forum is pleased to report that the momentum for mobile WiMAX is growing worldwide and is expected to accelerate now that the first 2.3GHz band products have been certified. 2.5GHz and 3.5GHz band mobile WiMAX products are making good progress in the certification process. The WiMAX Forum would be pleased to offer any further information regarding the current status of WiMAX technology.

- **Section 7.5.2 - Proposed ComReg Strategy for WBS**

The WiMAX Forum supports the ComReg proposal to fully adopt the recent EC Decision for the 3400-3800MHz bands and particularly to bring in the possibility for mobile services in this frequency range.

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24 WorldSpace

Submission re: ComReg 08/20

Contribution from WorldSpace, Inc. to the Commission for Communications Regulation (ComReg)

May 2008

WorldSpace, Inc.
8515 Georgia Avenue
Silver Spring, MD 20910
USA

1 Introduction

WorldSpace, Inc. (WorldSpace) appreciates the opportunity to offer its views on ComReg's Proposed Strategy for Managing the Radio Spectrum: 2008-2010. WorldSpace, a pioneer of satellite-based digital radio services, currently provides satellite radio services to subscribers around the world, delivering a unique combination of original WorldSpace content and leading global brands such as the BBC, CNN, RFI, CNN-IBN, Virgin Radio UK and many more.

WorldSpace and its European subsidiary, WorldSpace Europe, are currently developing a phased Europe-wide digital satellite radio service, consisting of subscription-based bouquets of more than 50 dedicated radio channels and innovative multimedia services per country, covering a wide range of exclusive talk, information and commercial-free music content tailored to national audiences. Initially the company will target the five main Western European linguistic markets: Italian, German, French, English and Spanish. In subsequent phases we intend to add additional linguistic markets, such as Dutch, Flemish, Polish, etc.

The company has at its disposal two satellites, constructed by Alcatel Alenia Space and EADS Astrium, with which it intends to launch its phased rollout of satellite radio services in Europe. The first satellite (AfriStar) is already operational in geostationary orbit. The second one, warehoused in Astrium facilities in Toulouse, France, is ready to be launched. Beyond these orbital assets, the company has also signed a number of contracts in anticipation of the deployment of its services in Europe, to be broadcast through a hybrid system combining a pan-European satellite component with national terrestrial gap-filler networks. These contracts include:

- Chipset reference design with the Fraunhofer Institute
- Terrestrial gap filler development and procurement with Sodielec (France)
- Design and development of a hybrid reception antenna with FIAMM (France)
- Conditional access system with Certicom
- Contract for the design, deployment and operation of the Italian terrestrial component of the system with Telecom Italia
- Contract with the Fiat Group for the installation and distribution of WorldSpace satellite radio in Italy
- Contract with Delphi to design the first WorldSpace satellite radio mobile receivers (aftermarket and OEM) for Europe

WorldSpace's European satellite radio service will be provided on the basis of the 12.5 MHz-wide frequency band (1479.5-1492 MHz) that has been harmonised in Europe for satellite radio, including complementary terrestrial repeaters (the "S-DAB band"). Our in-orbit satellite currently utilises the S-DAB band over Europe, and we have received licenses from Italy, Switzerland and Germany to deploy repeaters in that band. We anticipate receiving additional frequency licenses for the S-DAB band during the course of 2008 and 2009.

2 Comments

Section 4.4 New Spectrum Opportunities

ComReg has identified the frequency band 1452-1492 MHz as potentially being available for release in the 2009/2010 timeframe.

WorldSpace would like to take this opportunity to express its interest in using a portion of the band 1452-1492 MHz, corresponding to the upper 12.5 MHz (the S-DAB band), to provide Irish consumers with innovative multimedia services delivered via a hybrid satellite and complementary terrestrial network. As ComReg notes, Ireland's economy is highly developed and Irish consumers are widely recognized as "early adopters" of new technologies and services. And since English is one of the five primary linguistic markets that we are targeting in Europe, we view Ireland as an attractive market that we look forward to developing in partnership with local stakeholders.

Section 6.4.1 Spectrum Strategy in Support of Consumers

In support of the industry as a consumer of Spectrum:

WorldSpace appreciates ComReg's commitment to harmonise the use of spectrum in Ireland with international and European allocations. The S-DAB band is a case in point: at the international level, a 25 MHz segment of the L-band is currently available for the Broadcasting-Satellite Service (Sound) (BSS(S)), and the WorldSpace satellites enjoy regulatory priority in this band. At the European level, the Electronic Communication Committee of the CEPT adopted the Decision ECC/DEC/(03)02, harmonising the upper 12.5 MHz segment of the BSS(S) frequency band (1479.5-1492 MHz) for S–DAB use in Europe. WorldSpace intends to offer its pan-European service within this band.

Section 6.4.4 Spectrum Strategy in Support the Organization

WorldSpace agrees fully with ComReg's goal to ensure, where appropriate, compliance with international agreements on frequency usage and technical standards as a requirement for spectrum access. As described above, WorldSpace's satellite radio service in Europe will comply with the ECC Decision on the S-DAB band. In addition, WorldSpace's technical standard is in compliance with the European Telecommunications Standards Institute's (ETSI) "Satellite Digital Radio" (SDR) standard, adopted in December 2007.

Section 7.3.1 Spectrum for Broadcasting Services

1452-1492 MHz:

As ComReg notes, correctly, the upper 12.5 MHz of this band has limitations for terrestrial broadcasting services, due to "the requirement of each country to provide protection for the potential reception of satellite broadcasting services in other countries."

For example, WorldSpace Europe has recently been awarded a license in Germany to use the entire S-DAB band. Therefore, potential terrestrial services in neighbouring countries, such as the United Kingdom (UK) or France, would have to limit deployment in the S-DAB in border areas in order not to cause harmful interference to the German satellite radio service.

In addition, terrestrial broadcasting services in the S-DAB band would not be protected from interference coming from WorldSpace's pan-European satellite broadcasts, further limiting the potential use of this band other than for satellite radio.

Section 7.3.2 The Introduction of Multimedia Services

WorldSpace agrees with ComReg's view that multimedia services, including satellite-based services, could bring significant benefits to consumers. In this context, WorldSpace also agrees with the RSPG's opinion that "[i]n the bands 1479.5 – 1492 MHz, 1980 – 2010 MHz and 2170 – 2200 MHz, the existing international framework and the work achieved or in progress at CEPT and EU level could enable the deployment of pan-European multimedia services."

Section 7.3.5 Proposed ComReg Strategy for Broadcasting

As noted above, WorldSpace is interested in providing a hybrid satellite radio service in Ireland within the S-DAB band, and therefore is prepared to participate in any further public consultations on the future use of the 1452-1492 MHz band.

Section 7.9 Satellite Services

The WorldSpace satellites operate solely in the BSS(S) band described in the previous sections of this contribution. WorldSpace does not operate in any of the MSS bands described in section 7.9 of the consultation document.