



Commission for
Communications Regulation

Closure of the FWALA Operators Forum

Information Notice

Reference: ComReg 13/42

Version: Final

Date: 02/05/2013

An Coimisiún um Rialáil Cumarsáide
Commission for Communications Regulation

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1 Introduction

1. In 2003 the Commission for Communications Regulations ("ComReg") put a licensing scheme in place for the provision of Fixed Wireless Access Local Area (FWALA) licences.
2. Following the launch of this scheme ComReg established "The FWALA Operators Forum". The objectives of the Forum include promoting wireless broadband systems (WBS) as a viable and reliable alternative platform for the provision of Electronic Communication Services. The last meeting of the FWALA forum took place in December 2008 and is in hiatus, only being convened when inputs are received from interested parties. No inputs have been received from interested parties since the last meeting.
3. Following consultation, ComReg stated in document 11/89 "Strategy for Managing the Radio Spectrum 2011 - 2013" that given the maturity in the WBS market and the consolidation that has happened in the last number of years it was of the view that it is no longer appropriate for ComReg to run an operators forum for one particular licensing scheme. As such ComReg undertook to formally close the FWALA Forum and publish in aggregate form all the documentation dealt with by the Forum.
4. ComReg hereby notifies all interested parties that the FWALA Operators Forum is now closed.
5. The following annexes contain all the documentation of the 9 meetings of the FWALA Forum that took place from November 2004 to September 2008.

Annex: 1 Meeting 1, November 24 2004



FWALA Operator's Forum
1st Meeting
24th November 2004
At 9.30am (preceded by launch breakfast at 8.30am)
At the premises of ComReg

Agenda

1. Introduction
2. Forum Terms of Reference
3. Domestic Frequency Coordination
4. International Frequency Coordination
5. Procedure for FWALA Licence Renewals
6. Review of the FWA Broadband web-page
7. AOB



FWALA Operator's Forum

Forum Terms of Reference

The objectives of the Forum are to facilitate open discussion within the industry, agree procedures/practices among operators where necessary and promote FWA as a viable and reliable alternative platform for the provision of electronic communications services.

The Forum will be chaired by a representative of ComReg and membership of the Forum will be open to all licensed FWALA operators.

The forum shall:

1. Agree procedures and practices for frequency coordination (International & Domestic) between FWALA networks and between FWALA networks and other services where necessary;
2. Consider and contribute to developments of the FWALA licensing scheme;
3. Consider any other issues of common interest to FWALA operators;
4. Contribute, where possible, to the promotion of the profile of FWA in Ireland both within the industry and among consumers as a 'real-alternative' for broadband service provision;
5. Shall conduct an interim review within 12 months of its first meeting to review the work of the Forum and make recommendations on the future scope of the Forum.

Chairman:

Brian O'Dwyer

Commission for Communications Regulation

E-mail: brian.odwyer@comreg.ie

Tel: 01-804 9610

www.comreg.ie



Commission for
Communications Regulation

FWALA Operator's Forum

November 24th 2004

Agenda

FWAFor(04)03

- **Introduction**
- **Forum Terms of Reference**
- **Domestic Frequency Coordination**
- **International Frequency Coordination**
- **Procedure for FWALA Licence Renewals**
- **Review of the FWA Broadband web-page**
- **AOB**

Introduction

- **House Keeping**
- **Introductions**
- **Proposal: Quarterly Meetings – Various Locations**
- **Objectives:**
 - Forum for issues of common interest
 - Highlight wireless as an access solution
 - Agree procedures/practises as necessary
 - Consider/Contribute to the FWALA licensing scheme

Agenda

FWAFor(04)03

- **Introduction**
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Forum Terms of Reference

FWAFor(04)02

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- **Consider any other issues of common interest to FWALA operators;**
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Domestic Frequency Coordination

Issues:

- **Technology neutral licensing regime**
- **Certain freedom to deploy within service area**
- **Minimise potential for interference between FWALA networks;**

Objective:

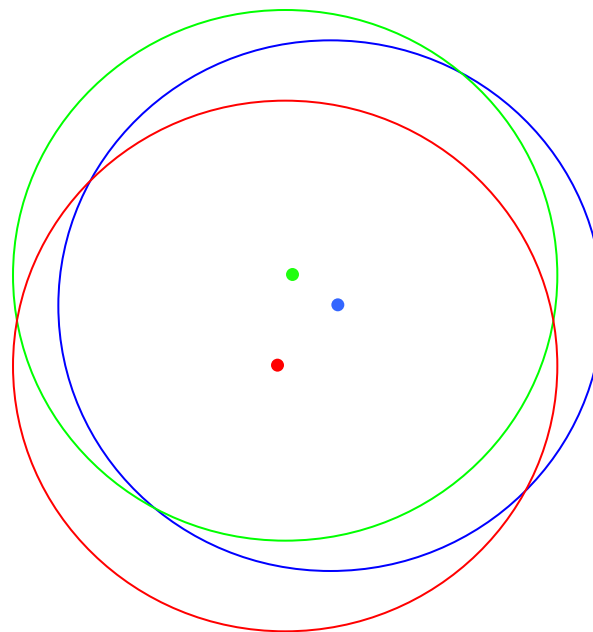
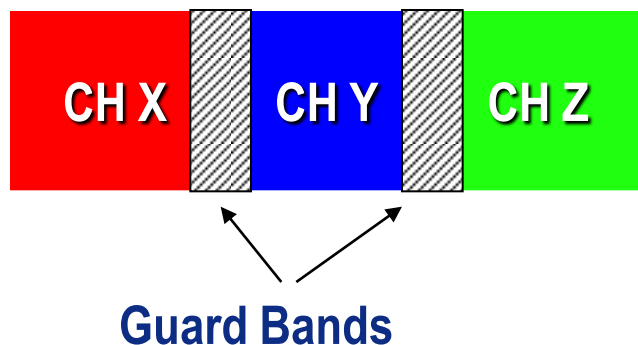
- **To develop and agree Code(s) of Practise (CoP) relating to Frequency Coordination between networks;**

Scenarios:

- **Adjacent Frequency/Same Geographic area**
- **Same Frequency/Adjacent Geographic area**
- **Others**

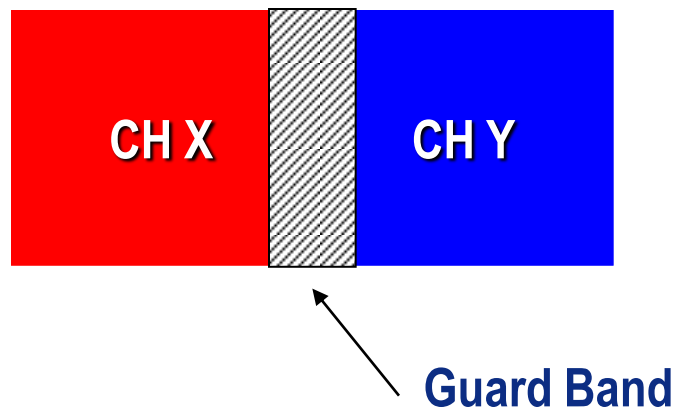
Scenario 1 – Adjacent Frequency/Same Area

- Guard bands will be required between operator's in the same local areas
- Not prescribed – Spectrally inefficient due to worst case
- Reference: ECC Report 33 (www.ero.dk)



Scenario 1 – Adjacent Frequency/Same Area

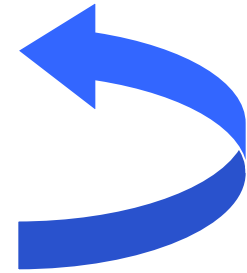
- **Option 1: Specific frequency guard band between operators in the same or overlapping areas**
 - Based on technologies deployed
 - Channel Bandwidth specific
 - Inflexible
 - May require constant revision with new operators entering the market
 - May restrict licensed bandwidth available for deployment



Scenario 1 – Adjacent Frequency/Same Area

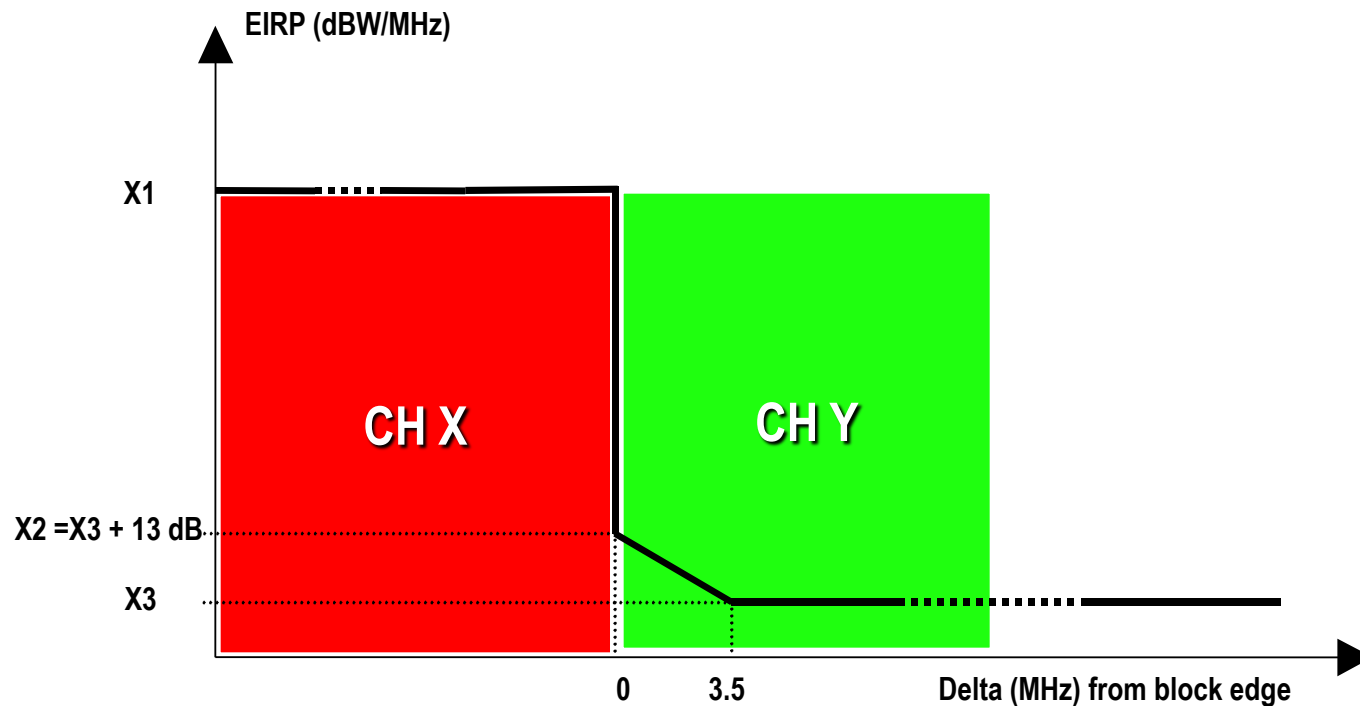
▪ **Option 2: Block Edge Mask**

- Technology Neutral
- Not specific to channel bandwidth
- Responsibility on Operator/Manufacturer
- Applicable to all Operators (Existing & Future)
- Restriction on Bandwidth use – Filter dependent
- Assumes low probability of worst case (i.e. two antennas facing each other a close distance)
- Specific Frequency coordination required in worst case



Scenario 1 – Adjacent Frequency/Same Area

▪ Option 2: Block Edge Mask



Scenario 1 – Adjacent Frequency/Same Area

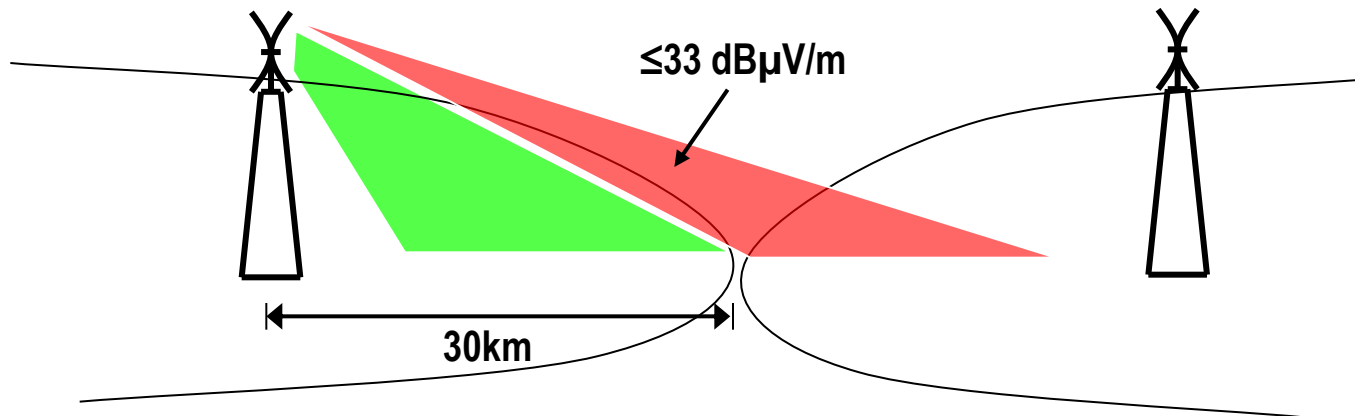
- **Option 1: Specific Guard Band**
- **Option 2: Block Edge Mask**
- **Option 3: ???**

- **Objective: Agreed CoP**

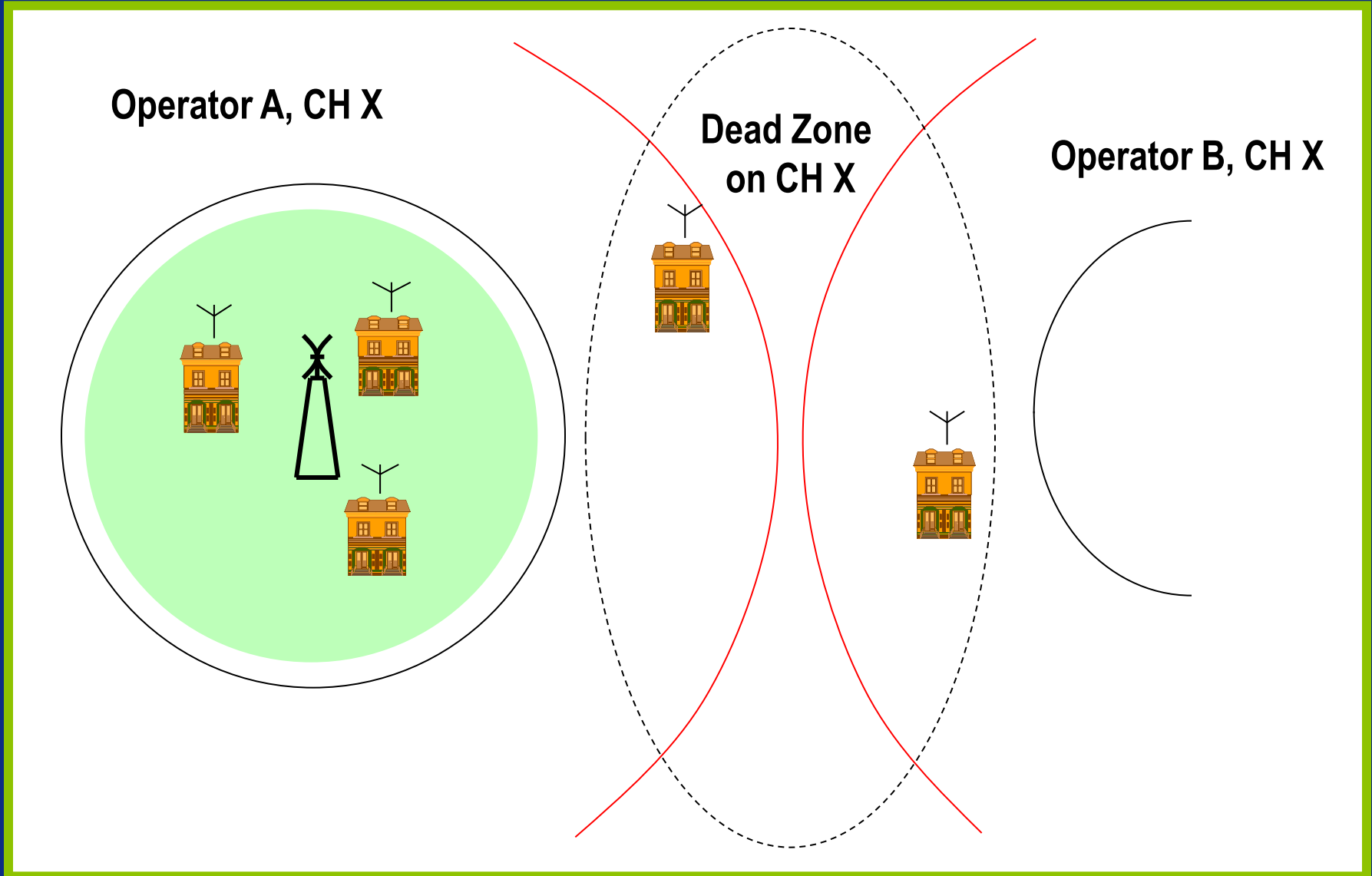
- **Any Operator Experience ??**
- **Any Opinions ??**
- **Applicability at 10.5GHz & 26GHz**

Scenario 2 – Same Frequency/Adjacent Area

- **Currently facilitated by Threshold Contour**
- **Aggregate Limit = $33\text{dB}\mu\text{V}/\text{m}$ at 30km from Local Area Centre**
- **ComReg calculate field strength using ITU-R P.452 (ref. 03/97)**
- **Any Operator Experience to date ??**
- **Any views on the current limit ??**

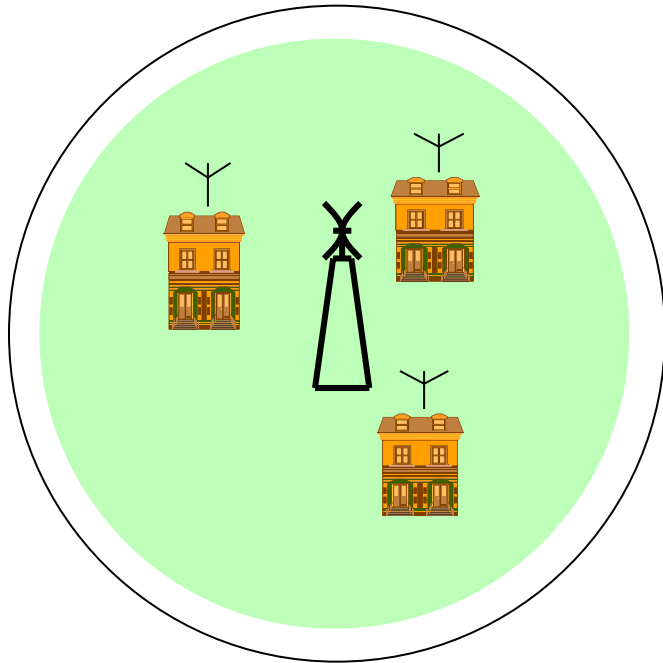


Scenario 3 - Others

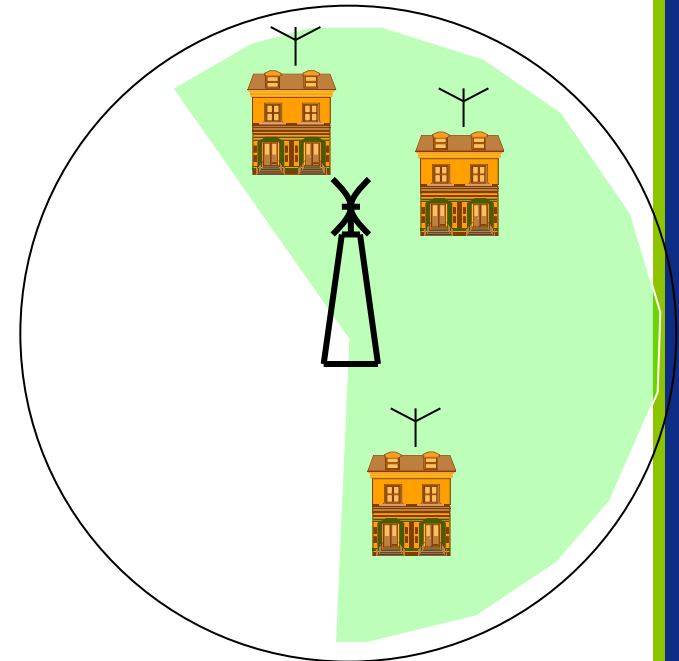


Scenario 3 - Others

Operator A, CH X

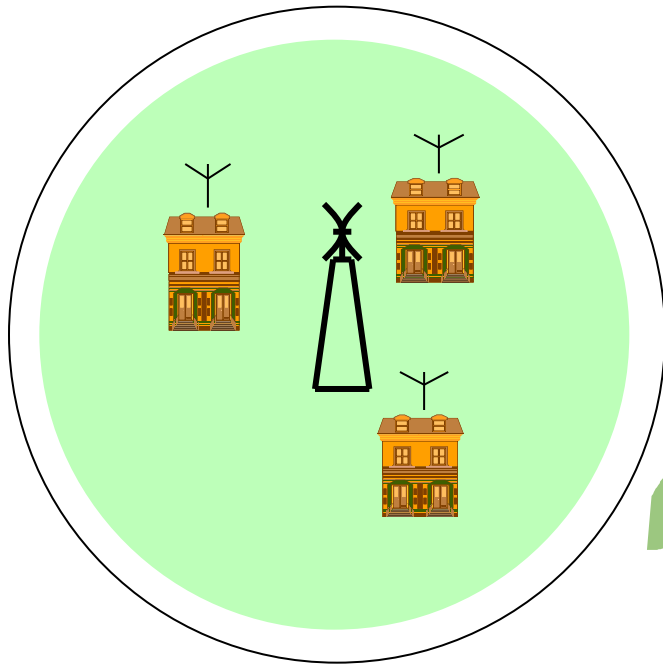


Applicant B, CH X

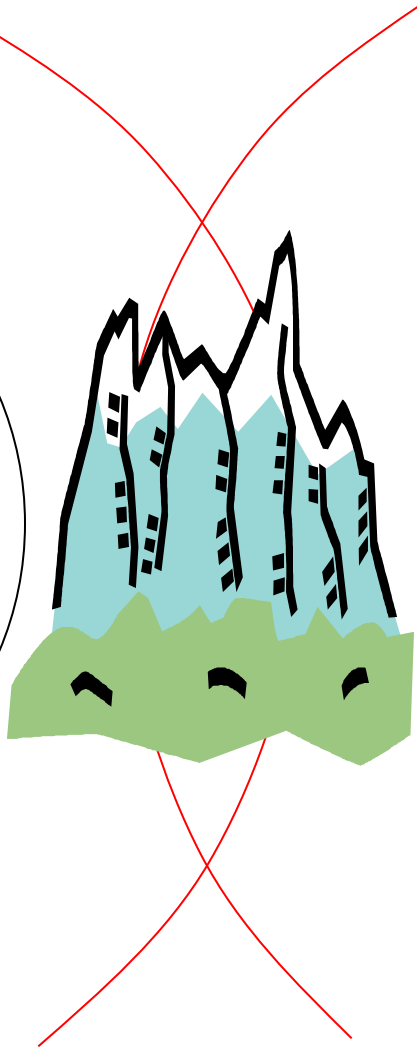
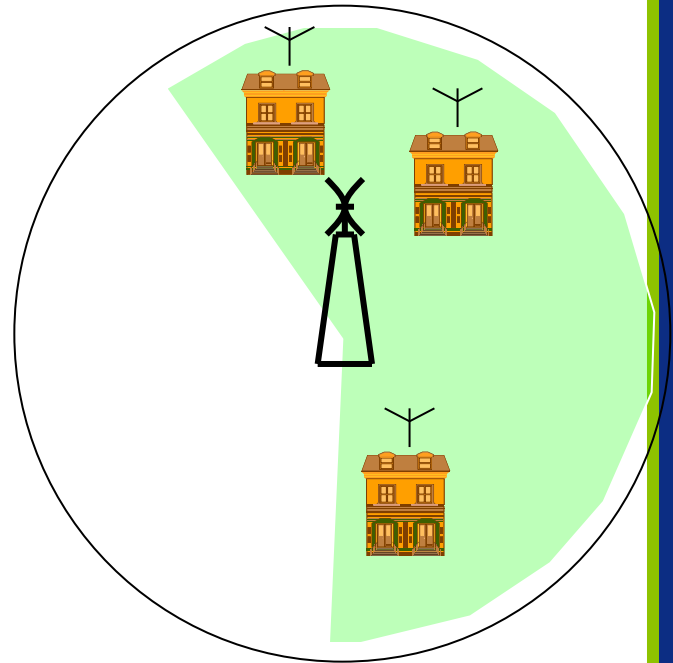


Scenario 3 - Others

Operator A, CH X



Applicant B, CH X



Scenario 3: Others

- **Is there a requirement to address these other scenarios ??**
- **Can solutions be made for 'other' scenarios??**
- **How best should solutions be agreed?? CoP??**

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Procedure for FWALA Licence Renewals

- **Declaration form to be circulated**
 - Specific to each licensed 'Local Area'
 - Compliance with Licence Conditions
 - Incl. list of all Base Stations (i.e. outlying stations) and equipment with coordinates for each licensed 'Local Area'
- **Renewal Milestones for Phase 1 Round 1:**
 - Declaration Form(s) to issue from ComReg prior to 03/12/04
 - Return of Declaration Form(s) with written request for renewal prior to 18/12/04
 - Re-issue of licences, subject to satisfactory compliance, prior to 18/01/05

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Review of the FWA Broadband Web-Page

- **Tool for Applicants/Consumers**
- **Inclusion of Coordination tool (International)**
- **Any suggestions on development ??**
- **<http://www.comreg.ie/FWABroadband/FWABroadband.asp>**

FWA Broadband - Commission for Communications Regulation - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Address <http://www.comreg.ie/FWABroadband/FWALA3-5.asp?S=4&NavID=2288M=>

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- Telecommunications
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 - Licensing & Exemptions
 - Broadcasting
 - Radio Spectrum
 - Number of Licensees
 - 5.8 GHz Registration
 - FWA Broadband**

Fixed Wireless Access Local Area (FWALA) - 3.5GHz

This Fixed Wireless Access Local Area (FWALA) licensing scheme offers local area licences in the 3.5 GHz band. There are four channels available for licensing for FWALA at 3.5 GHz, this means that there can be up to four different service providers using FWALA 3.5 GHz in any given local area. For details about the available frequencies click [here](#). For specific detail on the licensing scheme and application form, please refer to ComReg Document [03/97](#).

Service Area:

Under this scheme, a licence is issued to a service provider for a central base station which will control the FWA network and for the radio equipment required to link to the customers premises. Each licensed base station may be used to provide broadband services to consumers in the geographic area immediately surrounding the licensed base station. This area is known as the base station 'Service Area'¹⁴ and may extend up to a maximum of 15km from the location of the licensed base station.

Coordination Area:

What's New

Extension of Deadline

Monday, November 22, 2004

ComReg advises that the deadline for responses to the consultation on the Interconnection Markets Review Document ComReg04/106 is now extended to December 13th 2004.....

ComReg Outlines Proposed Remedies in the Market for Wholesale Broadband Access

Friday, November 19, 2004

ComReg today published its response to consultation on the Draft Decision on obligations proposed for the wholesale broadband market.....

Internet

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Any Other Business

- **Format for submitting Subscriber information**
- **VoIP – Oonagh O'Reilly**
- **Schedule of meetings**
- **Next Agenda ??**

Closure of the 1st Meeting of the FWALA Forum

With special thanks to:

John Doherty

Dave Gunning

Jim Connolly

Samuel Ritchie

Oonagh O'Reilly

Sinead Devey

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ComReg in the International Context of Spectrum Management

24/04/2013

Why Regulate Use of the Spectrum? (1)

- **Spectrum shared** by users & by different services (e.g. fixed & satellite)
- **Interference**: Radio waves do not respect national boundaries
- Only relatively small part of spectrum suitable for broadcast / mobile services - demand for frequencies often exceeds supply (*not a major problem in IRL*)
- **Harmonisation** facilitates pan-European services (GSM, 3G, FWA), regional & global markets

Why Regulate Use of the Spectrum? (2)

Spectrum is a valuable national resource: significant **strategic**, **economic** and **social** value to a nation

➤ **Strategic value:**

- Improve international competitiveness
- Defence, emergency services

➤ **Economic value:**

- significant contributor to GDP
- affordability for operator and customer

➤ **Social value:**

- Broadcasting, education, telecomms, etc

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International Spectrum Management Organisation

24/04/2013

ITU
189 Member States

CEPT
46 European Administrations

European Union
25 Member States

Ireland
(DCMNR, ComReg,
industry, users, etc.)

Broad categories of usage
(allocations) and regulations
(e.g. for co-ordination)
agreed at World Radio
Conferences (**ITU**) -
international treaty status

Harmonised Regional
solutions (e.g. GSM,
DTT) in **CEPT** via
Decisions, European
Frequency allocations,
etc.

EC Directives, Legislation
Framework Directive

National legislation, policy, strategies,
management of spectrum

CEPT

- **46 Member Administrations** (>50% are EU members)
- **Europe-wide organisation of telecom administrations**
- **Harmonisation of telecoms, radiocomms and postal issues**
- **Implementation oriented and problem-solving focus**
- **Regulatory/operational/technical decision making**

- **European Radiocommunications Office: Permanent Expert Support facility**

See www.ero.dk

For CEPT Decisions, Recommendations, Reports

EU/EC

- **25 Member States (>50% of CEPT members)**
- **Legislative framework for Europe**
- **Legally binding Directives (e.g GSM)**
- **EC Radio Spectrum Policy Group – strategic advice**
- **EC Radio Spectrum Committee – implementation issues (SRR, 3G, UWB etc...)**

- **ComReg participates in CEPT working groups, project teams, EC RSPG (at Commissioner level) and RSC, ITU (mainly at World/Regional Radio Conferences)**

Relevant outputs (for FWALA)

- **EC Framework and Authorisation Directives: rights of use for radio frequencies; open, transparent, non-discriminatory procedures**
- **ITU-R Recommendation P.452-10 on Prediction procedure for the evaluation of microwave interference between stations on the surface of the Earth at frequencies above about 0.7 GHz**
- **CEPT ECC Report 33 on the coexistence of FWA cells in the 3.4 - 3.8 GHz band**

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International Coordination Considerations

Samuel Ritchie
FWALA Forum
24 November 04




Topics

- Why worry about international coordination.
- Problems
- Some possible solutions
- Proposed MoU
- Issues




International Coordination

- **Sovereign right of Countries.**
- **Equitable access to spectrum**
- **Protection from Harmful Interference**
- **Facilitate the efficient and effective operation of radio systems.**
- **Entered into agreements:**
 - Aeronautical
 - Maritime
 - Broadcasting
 - GSM and 3G agreements

The Problem

- **Fictitious site on Carlingford Mountain**
- **Serving Dundalk and area north of Dundalk**
 - Frequency 3.5 GHz
 - 200 Watts erp
 - 30 Meters agl
 - Omni - directional antenna
- Colours:
 - **Green = Good signal strength** 
 - **Blue = Acceptable signal strength** 
 - **Red = Inadequate signal strength** 

Solutions

- **Fictitious site on Carlingford Mountain**
- **Serving Dundalk and area north of Dundalk**
 - Frequency 3.5 GHz
 - 200 Watts erp / *13 Watts erp*
 - 30 Meters agl / *10 meters agl*
 - Omni - directional antenna / *Directional antenna(s)*
- Colours:
 - **Green = Good signal strength** 
 - **Blue = Acceptable signal strength** 
 - **Red = Inadequate signal strength** 

Solution

- **A combination of reduction in height or power and/or use of directional antenna,**
- **Not always possible to achieve the ideal**
- **Agree with affected Countries on amount of signal that can cross border.**
- **Establishment of agreement in form of MoU – Memorandum of Understanding.**
- **Possibility of agreement outside the MoU – a long and tedious process.**

MoU

- Content:
 - **Agree an acceptable field strength – compromise.**
- Field Strength = 33 dB μ V/m
- Power Spectral Flux Density (PSFD) = -102.5 dBW/MHz/m²
 - **Agree on where to calculate this field strength value.**
- Calculate at border or even 10 - 15 Km inside border
 - **Agree how the field strength will be calculated**
- Input into model
 - **Agree what propagation model will be used.**
- FSL, Rec. 370, Rec. 1546. Rec. 452 – any model modifications, parameters?

Issues

- Every Licence is subject to coordination
- Customers over the border?
- Propagation modelling – what the &%\$£!”
- A simple worse case, best guess tool for the website.

Worse Case Coordination Tool

Enter Maximum Transmitter power (Watts)

200

Enter maximum antenna height above average terrain (m)

27

Calculate

If this sight is within 12 km of the border then it may need to be coordinated.

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Commission for
Communications Regulation

International Coordination Considerations

Samuel Ritchie
FWALA Forum
24 November 04

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Voice over IP (VoIP) Briefing

Oonagh O'Reilly
24 November 2004

ComReg Consultation on VoIP

- Consultation on ComReg 04/72 opened 17/6/04 & 17 responses received (incl. non-Irish). Our response paper ComReg 04/103 published 14/10/04.
- Main focus and driver for consultation was numbering but other relevant issues also covered:
 - Quality;
 - Interconnection;
 - Calling Line Identification;
 - Directory Enquiries;
 - Emergency Access;
 - Tariffing;
 - CPS;
- '076' non-geographic number range designated
 - **existing geographic and other numbers also possible**
- Actions now underway to achieve activation of new range (interconnection and tariffing to be concluded).

Consumer Advantages

- Cheaper voice (free for on-net calls in many cases)
- Quality
- Wider choice of services (Richer user interface)
- Infrastructure "independence"
- CLI and Directory listings (as well as access to DQ)
- Number portability
- Network convergence

Consumer Disadvantages

- More abuse (similar to Internet abuse)
- Access to emergency services; location information
- Impact of delaying tactics by other incumbents (both fixed and mobile)
- True location of user with "ordinary" geographic number could be masked by VoIP
- General confusion

Issues to be considered (1)

- Growth of VoIP may cannibalise PSTN revenues
 - **What about funding of Universal service?**
- Emergency access for 112/999 calls: PATS must deliver call to geographically and service appropriate emergency access point
- Location info provision to emergency service also difficult for VoIP SP due to nomadicity
- Legal Interception
- Not all service providers will have the right to take advantage of number portability; this right depends on the classification of the service provided

Issues to be considered (2)

- In-line powering of terminals
- Privacy, Data retention & system security issues (SPIT, DoS etc.)
- Extra-territoriality of VoIP
- Numbers
- Regulatory oversight

Next Steps - VoIP Workshop

ComReg want to work with interested parties to ensure the growth of VoIP services for the benefit of all.

Topics will include

Emergency Services / Number Portability

Point of Sale v Point of Use / Network Integrity

DQ / Services for disabled users / Itemised billing

Other issues such as protection from SPIT, DoS, viruses etc.

Who should come?

(Potential) Service Providers, consumer groups, network operators etc.

Next steps – Other issues

Monitor developments at EU level

Guidelines due out in the New Year

Monitor standardisation developments

Location information, legal intercept, etc.

ComReg Document 04/103

“VoIP Services in Ireland: Numbering and Related Issues”

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oonagh.oreilly@comreg.ie

FWALA Forum
1st Meeting
24th November 2004 / 9.30am – 12.45pm
Venue: ComReg

Attendees:

Name	Organisation
Brian O'Dwyer (Chairman)	ComReg
Jim Connolly	ComReg
Susan Fleming	ComReg
Ray O'Leary	High Speed Data Solns
Mark O'Raw	High Speed Data Solns
AJ Cahill	Airspeed Comms
Liam O'Kelly	Airspeed Comms
Tadhg O'Toole	Budget Wireless
Rory Ardagh	Leap Broadband
Ed Diggin	Real Broadband
Ruairi Jennings	Irish Broadband
Brent Smith	Clearwire Ireland Inc.
Colm Piercy	Digiweb Ltd (late arrival)

Forum Opening:

ComReg Chairperson John Doherty opened the Forum following a CEOs Breakfast.

Adoption of the Agenda:

The Forum adopted the agenda as shown in Annex 1.

Forum Terms of Reference:

The Terms of Reference (ToR) for the Forum were discussed. For the moment, the Forum agreed that participation in the Forum should be limited to FWALA licencees. It was agreed that issues relating to spectrum trading and site sharing could be considered under the existing ToRs.

The Forum adopted the Terms of Reference as shown in Annex 2.

Jim Connolly gave a presentation on spectrum management and policy in the context of the international spectrum management framework.

Domestic Frequency Coordination:

It was generally agreed that Code(s) of Practice (CoP) are an appropriate tool for dealing with domestic frequency coordination. In addition it was suggested that a procedure should be developed for 'Conflict Resolution' where mutual agreement on the use of frequencies cannot be achieved within the scope of a CoP. It was recognised that Operators are rolling out networks in licensed spectrum and that incidents requiring domestic frequency coordination should be exceptional, providing agreed CoPs are adhered to.

The already existing cooperation between many of the members of the forum while operating in the license-exempt spectrum was highlighted and it was agreed that a list of contacts (relevant to frequency coordination issues) from each operator would be made available by ComReg on a 'Forum-only' web page (see below).

It was suggested that a database of sites 'going-live' during a network build out, open to members of the forum, would be a useful tool to operators trouble-shooting in the event of interference arising. It was recognised that some commercial sensitivity may be associated with individual sites going live. One solution may be that initially such a database could be developed for each 'Local Area' going-live as opposed to each particular site. However, this issue is open for further discussion at a later meeting.

ComReg agreed to develop a 'Forum-only' web-page to facilitate Operator's coordination contact information, a 'Going-live' database for licensed local areas and any other Forum business such as meeting documentation/inputs etc.

It was generally agreed that the 'Block-edge mask' approach is the most flexible approach for accommodating guard bands between adjacent spectrum users under the FWALA licensing scheme. A draft CoP will be developed on this basis. ComReg agreed to review the approach and specific values used in relation to guard bands by other countries that have licensed 3.5GHz spectrum. Inputs are requested on this topic for discussion at the next forum. [Goal: To agree a draft CoP for Guard Bands at the next meeting].

ACTION
All Members

A brief discussion was held on the 33dB μ V/m threshold limit between licensed co-channel spectrum users in adjacent geographic areas. Some expressed the view that the current limit was 'tough'. ComReg indicated that such a limit may be revised as real experience with FWALA systems emerge but emphasised that the primary goal of this limit was to minimise the potential of interference between licensed users.

A discussion was held on the topic of 'other' coordination scenarios not currently permitted under the licensing scheme following a presentation by ComReg. Several suggestions were made during the discussion such as ad-hoc agreements between licensed operators or reduction of interference zones with reduced service areas as possible solutions to some of these 'other' coordination scenarios. ComReg emphasised the importance that any solution should be within the regulatory framework, as unauthorised use of the 3.5 GHz band (e.g. CPE outside the licensed service area) was not acceptable. ComReg agreed to produce a discussion document on 'Other' coordination scenarios for the next meeting and welcomes any input from members on this topic.

ACTION
ComReg
All Members

International Frequency Coordination:

Samuel Ritchie (ComReg) gave a presentation on the background to International Coordination and an overview of the Memorandum of Understanding (MoU) currently under negotiation between ComReg and Ofcom of the UK for spectrum use

of the 3.5GHz band. Samuel also proposed including an electronic worst-case, best guess tool on the Forum web-site to allow operators decide whether coordination needs to be investigated for individual site deployments.

ACTION
ComReg

FWALA Licence Renewals:

ComReg informed the meeting that a Declaration would be sent out to operators holding Local Area licences due to terminate in the New Year. The form will be a declaration of compliance with the licence conditions by licensees and a list of base stations and outlying stations in each local area. A declaration form will be required for each licensed local area.

The declaration forms will be sent out by 3 December 2004 for licences with termination dates in January 2005 and should be returned with a written request for renewal of licences by 18 December 2004. Licences will be renewed, subject to satisfactory compliance with the licence conditions, before the termination date of the current licences.

ACTION
ComReg
All Members

ComReg indicated that the exact process for re-assignment of spectrum made available in the event of non-renewal of a local area licence or the licensee returning the spectrum to ComReg is still under consideration and will be made available in the near future.

ACTION
ComReg

Review of the FWA Broadband web-page:

ComReg stated that the voluntary commitments included as licence conditions in 3.5GHz FWALA licences would be published at an appropriate time. In particular clarity needs to be ensured in relation to tariff offerings for particular services as operators are free to offer a range of services at prices determined by market demand in addition to the committed services (with maximum tariff) included in their licences.

Any Other Business:

Format for submitting subscriber information:

The Forum agreed that FWALA subscriber information should be collated along the lines of the existing Quarterly Report questionnaire. ComReg highlighted that all such data would be aggregated and it would not be possible to identify individual licensees subscriber figures. The data will also be used by ComReg to enhance the profile of FWA as a growing platform (e.g. in submissions to Oireachtas committees and the European Commission). Currently the Quarterly Report questionnaire is under review and ComReg will circulate the FWA section for comment from the Forum as soon as it is available.

ACTION
ComReg
All Members

Oonagh O'Reilly (ComReg) gave a presentation on the current regulatory developments in the field of VoIP.

The group agreed that quarterly meetings of the Forum were appropriate and the next meeting shall be scheduled for the end of February 2005.

Brian O'Dwyer
Chairman
FWALA Forum
2 December 2004

Annex 1



**FWALA Operator's Forum
1st Meeting
24th November 2004**

**At 9.30am (preceded by launch breakfast at 8.30am)
At the premises of ComReg**

Agenda

1. Introduction
2. Forum Terms of Reference
3. Domestic Frequency Coordination
4. International Frequency Coordination
5. Procedure for FWALA Licence Renewals
6. Review of the FWA Broadband web-page
7. AOB

Annex 2



FWALA Operator's Forum

Forum Terms of Reference

The objectives of the Forum are to facilitate open discussion within the industry, agree procedures/practices among operators where necessary and promote FWA as a viable and reliable alternative platform for the provision of electronic communications services.

The Forum will be chaired by a representative of ComReg and membership of the Forum will be open to all licensed FWALA operators.

The forum shall:

1. Agree procedures and practices for frequency coordination (International & Domestic) between FWALA networks and between FWALA networks and other services where necessary;
2. Consider and contribute to developments of the FWALA licensing scheme;
3. Consider any other issues of common interest to FWALA operators;
4. Contribute, where possible, to the promotion of the profile of FWA in Ireland both within the industry and among consumers as a 'real-alternative' for broadband service provision;
5. Shall conduct an interim review within 12 months of its first meeting to review the work of the Forum and make recommendations on the future scope of the Forum.

Chairman:

Brian O'Dwyer

Commission for Communications Regulation

E-mail: brian.odwyer@comreg.ie

Tel: 01-804 9610

Annex: 2 Meeting 2, May 5 2005



FWALA Operator's Forum
2nd Meeting
10.00am, 5th May, 2005
At the Gresham Hotel, O'Connell St, Dublin

Agenda

1. Introductions
2. Update on FWALA Licence Renewals
3. Update of the FWA Broadband web-page
4. Procedure for Re-Assignment of Spectrum
5. Domestic Frequency Coordination
6. CEPT Joint Project Team on BWA
7. Date for next Forum Meeting
8. AOB

www.comreg.ie



Commission for
Communications Regulation

FWALA Operator's Forum

2nd Meeting

5 May 2005

Agenda

FWAFor(05)01

- **Introduction**
- **Update on FWALA Licence Renewals**
- **Update on FWA Broadband Web-Page**
- **Procedure for Re-assignment of Spectrum**
- **Domestic Frequency Coordination**
- **CEPT Joint Project Team BWA**
- **Date for Next Meeting**
- **AOB**

Agenda

FWAFor(05)01

- **Introduction**
- **Update on FWALA Licence Renewals**
- **Update on FWA Broadband Web-Page**
- **Procedure for Re-assignment of Spectrum**
- **Domestic Frequency Coordination**
- **CEPT Joint Project Team BWA**
- **Date for Next Meeting**
- **AOB**

Introduction

- **House Keeping**
- **Introductions & Apologies**
- **Review of Previous Minutes (FWAFor(04)04)**
 - No comments Rec'd
 - Actions:
 - Development of Forum Web-Page (ComReg)
 - Input for CoP on Guard Bands (All)
 - Input on 'Other' scenarios (All)
 - Spectrum Re-assignment Process (ComReg)
 - Submission of Subscriber Info (All)

Agenda

FWAFor(05)01

- **Introduction**
- **Update on FWALA Licence Renewals**
- **Update on FWA Broadband Web-Page**
- **Procedure for Re-assignment of Spectrum**
- **Domestic Frequency Coordination**
- **CEPT Joint Project Team BWA**
- **Date for Next Meeting**
- **AOB**

Update on FWALA Licence Renewals

- **Phase 1 Licence Renewal Summary**
 - 37 licences reviewed (incl. site visits)
 - 36 licences renewed
- **Publication of Phase 1 Licence Detail – Voluntary Commitments**
 - Document FWAFor(05)02 – Publication Friday 6 May
- **On-going Licensing and Renewals**
 - Transfer to Licensing Operations
 - Declarations and Invoicing for Renewals

Agenda

FWAFor(05)01

- **Introduction**
- **Update on FWALA Licence Renewals**
- **Update on FWA Broadband Web-Page**
- **Procedure for Re-assignment of Spectrum**
- **Domestic Frequency Coordination**
- **CEPT Joint Project Team BWA**
- **Date for Next Meeting**
- **AOB**

Agenda

FWAFor(05)01

- **Introduction**
- **Update on FWALA Licence Renewals**
- **Update on FWA Broadband Web-Page**
- **Procedure for Re-assignment of Spectrum**
- **Domestic Frequency Coordination**
- **CEPT Joint Project Team BWA**
- **Date for Next Meeting**
- **AOB**

Procedure for Re-assignment of Spectrum

- **Document FWAFor(05)04**
- **Main Points:**
 - ComReg will publish an Information Notice detailing the new spectrum availability and inviting applications for a fixed period of time (similar to Phase 1);
 - All applications received during this specified period of time will be treated as though they arrived at ComReg on the same day;
 - Comparative evaluations will be conducted for overlapping applications;
 - Licences shall be offered to successful applicants in due course;
- **Information Notice to issue soon – Channel B in North Kerry and Limerick**

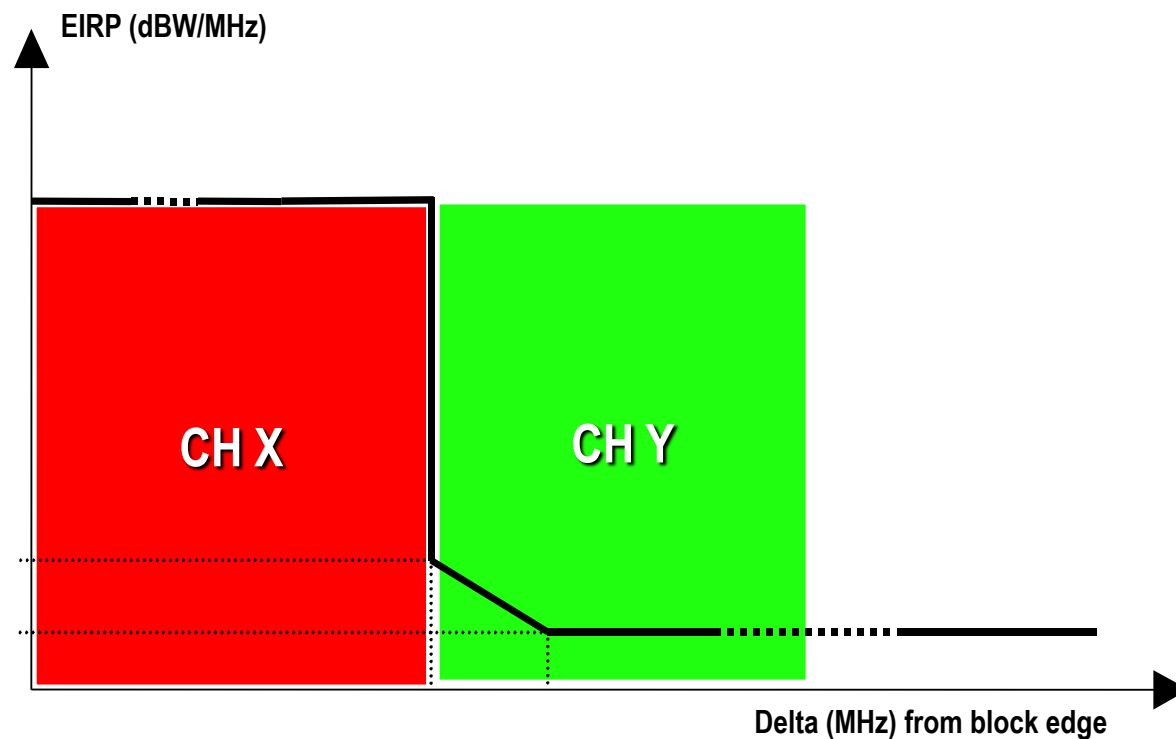
Agenda

FWAFor(05)01

- **Introduction**
- **Update on FWALA Licence Renewals**
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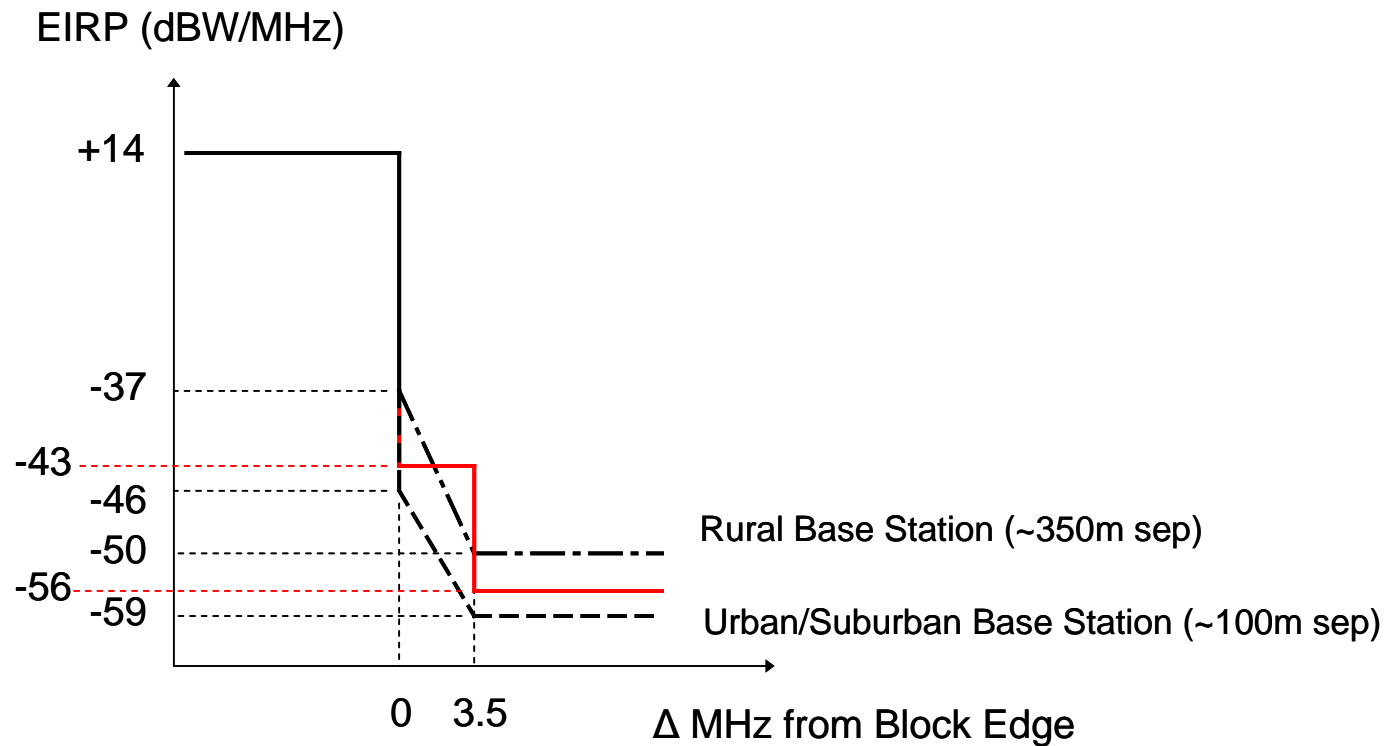
Block Edge Mask (1) – Adjacent Channel Operators

- Previous meeting agreed to pursue a **Block Edge Mask** approach



Block Edge Mask (2) – Adjacent Channel Operators

- Some specifics – Draft ECC Recommendation (04)05 & Ofcom (UK)

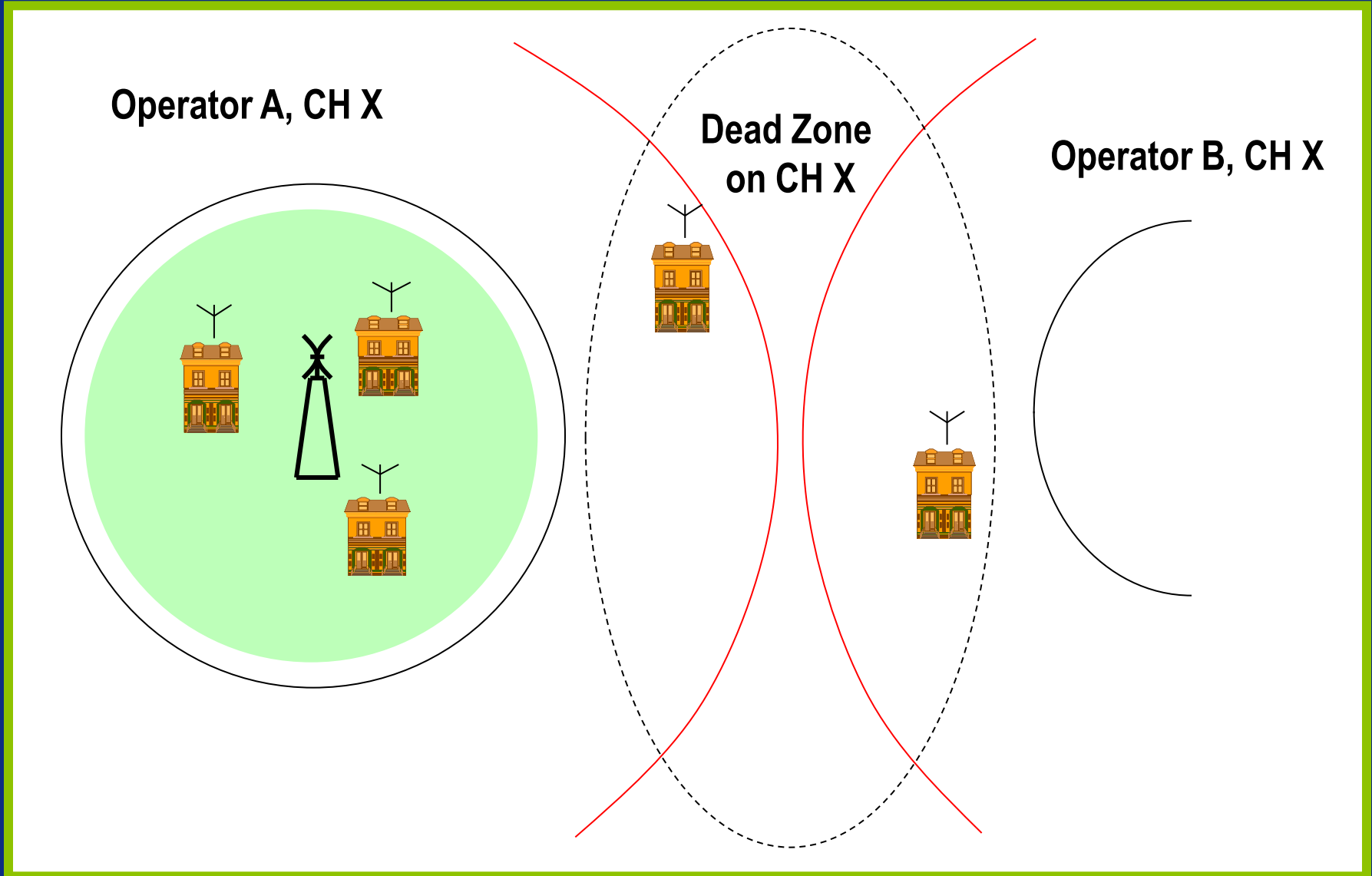


- Draft Code of Practise – FWAFor(05)03

'Other' Scenarios (1)

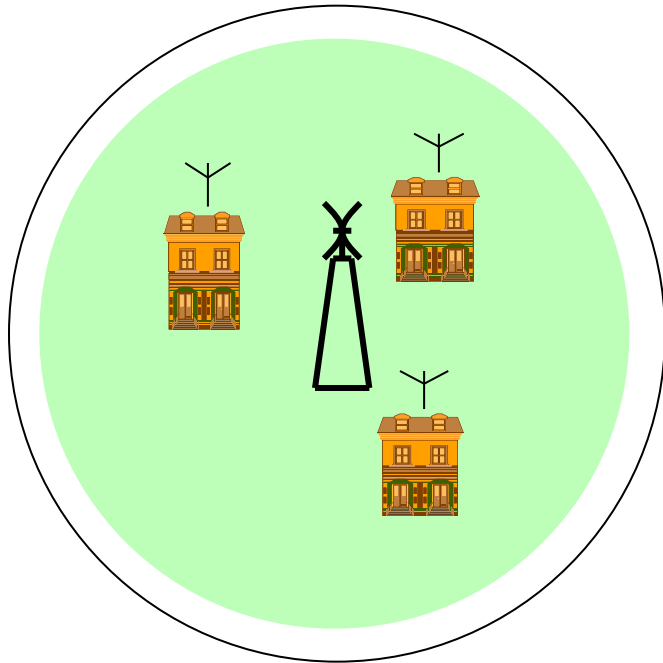
- **Brief Review:**

'Other' Scenarios (2)

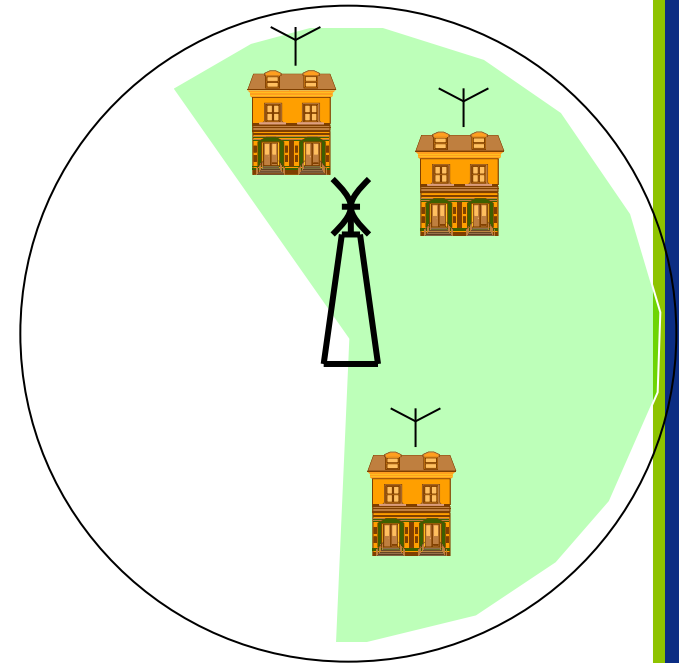


'Other' Scenarios (3)

Operator A, CH X



Applicant B, CH X

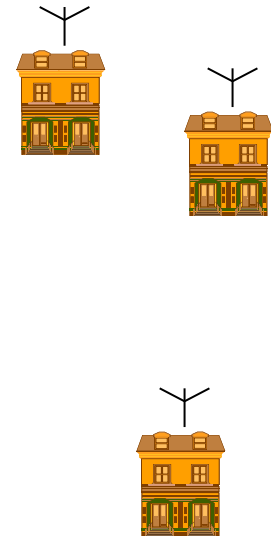
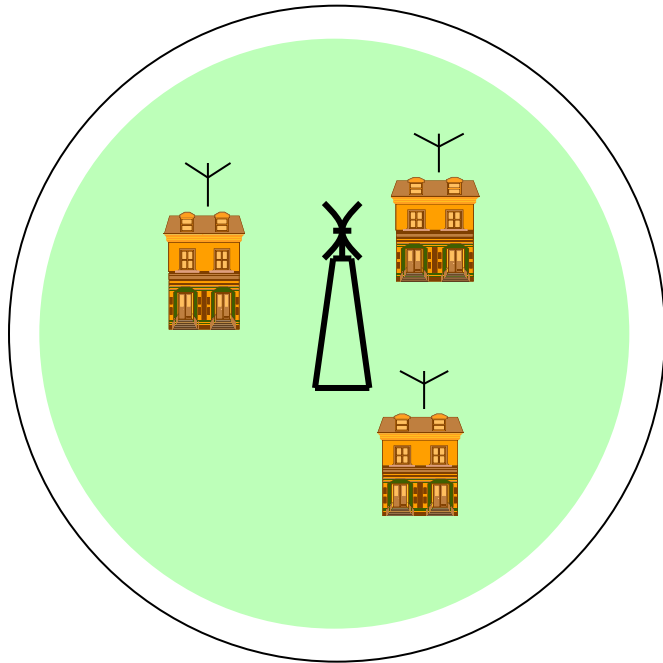


'Other' Scenarios (5)

- **Brief Review:**
- **Some suggestions from previous meeting**
 - ad-hoc agreements between Operators
 - reduction of interference zones
- **Possible Approaches ??**

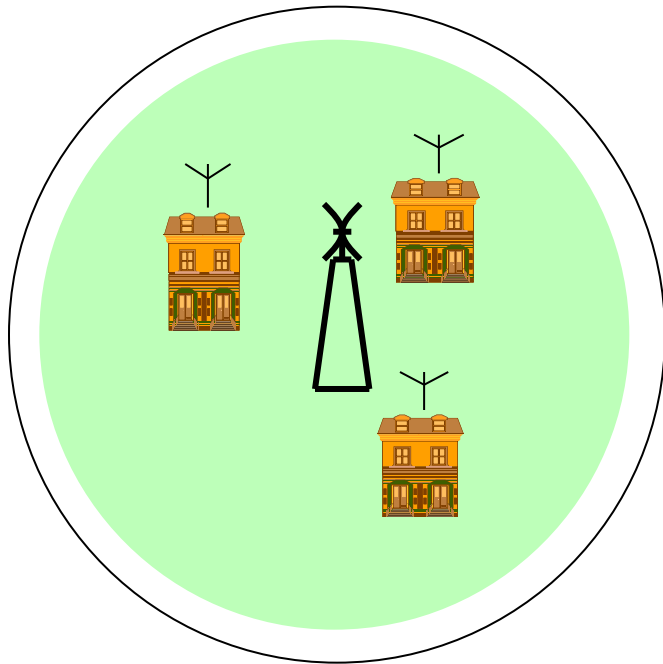
'Other' Scenarios (6) – Possible Approaches

Operator A, CH X

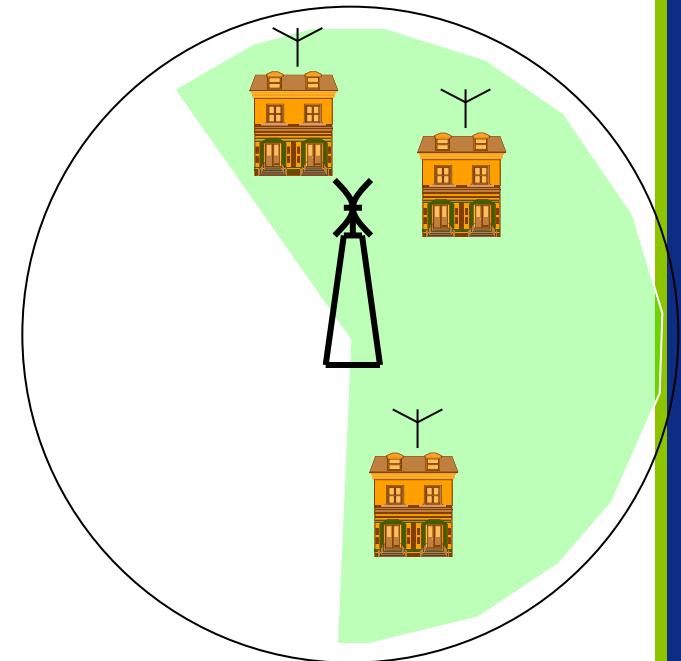


'Other' Scenarios (7) – Possible Approaches

Operator A, CH X

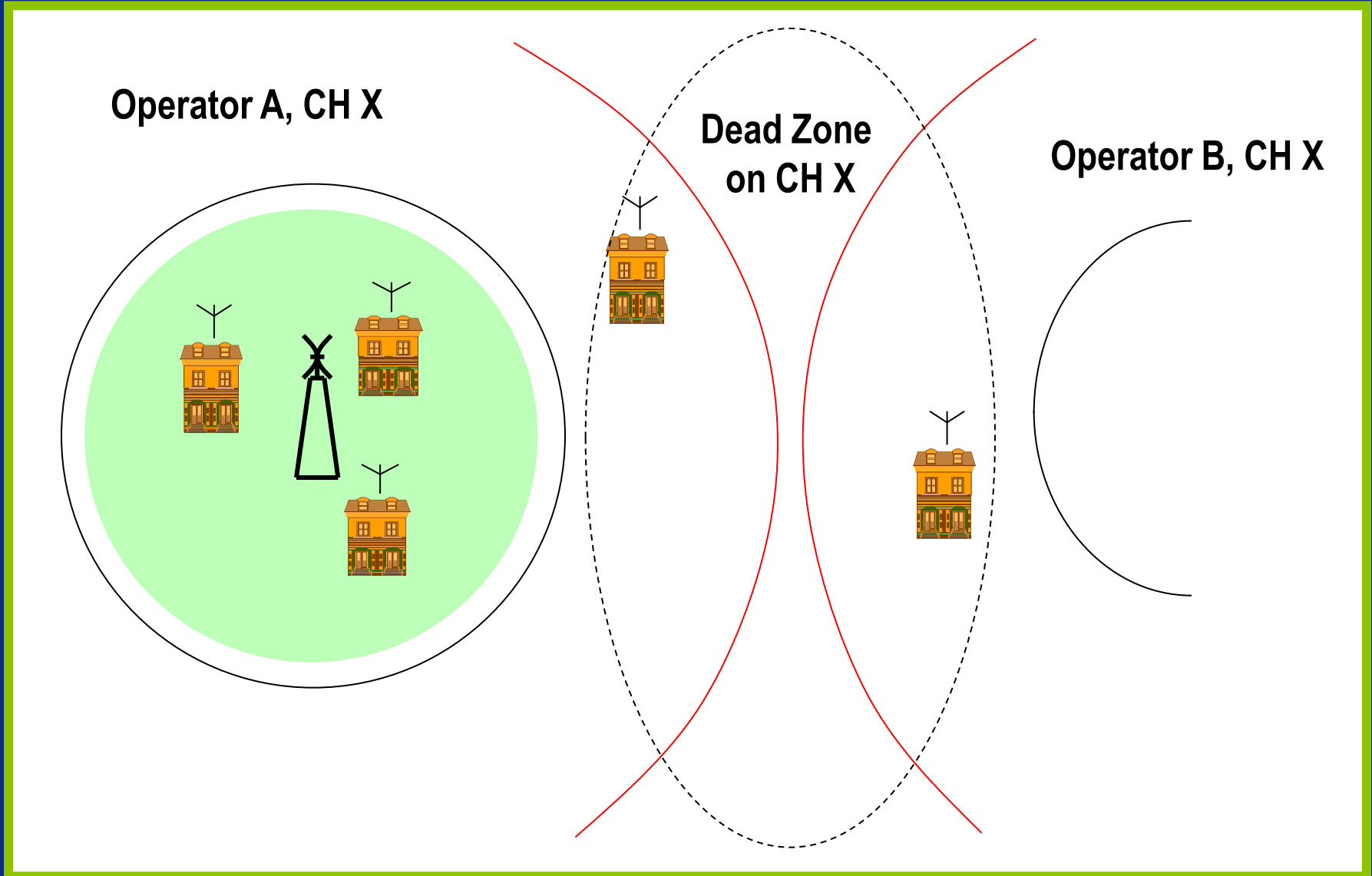


Applicant B, CH X

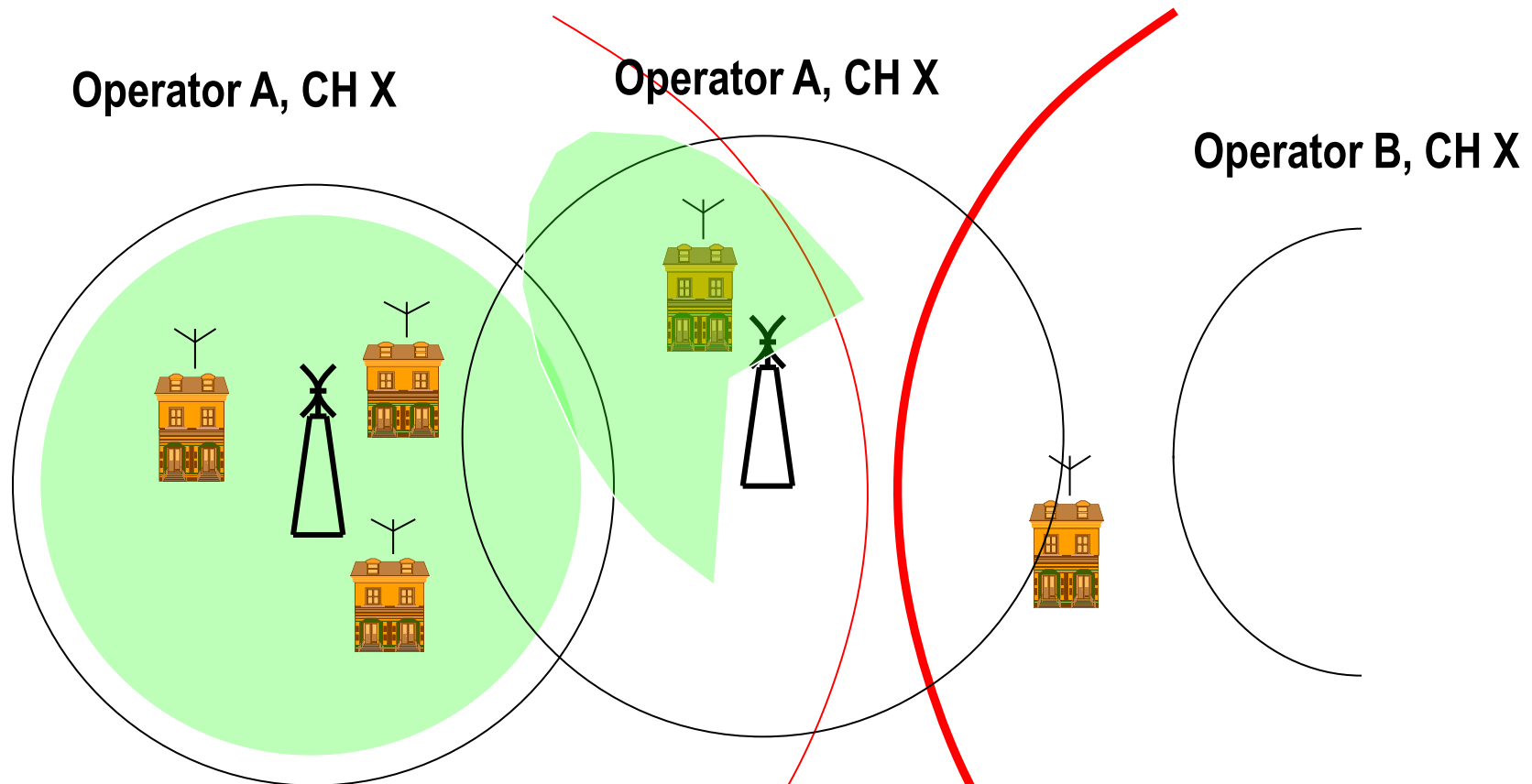


- **Licensing Challenge to define Applicant B's threshold contour**
- **Onus on the Applicant to ensure non-interference**

'Other' Scenarios (8) – Possible Approaches



'Other' Scenarios (9) – Possible Approaches



- Based on Agreement between Licensees in questions
- Precludes new operator in this particular situation – possibility of an alternative channel available

'Other' Scenarios (5)

- **Brief Review:**
- **Some suggestions from previous meeting**
 - ad-hoc agreements between Operators
 - reduction of interference zones
- **Possible Approaches ??**
- **Finding a way forward ??**

Agenda

FWAFor(05)01

- **Introduction**
- **Update on FWALA Licence Renewals**
- **Update on FWA Broadband Web-Page**
- **Procedure for Re-assignment of Spectrum**
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- **CEPT Joint Project Team BWA**
- **Date for Next Meeting**
- **AOB**

CEPT Joint Project Team BWA

- **SE38 – 5.8GHz compatibility studies**
- **SE19 – Co-existence work 3.5GHz**
- **JPT BWA – to develop regulatory solutions for Broadband Wireless Access**
 - Draft ToR from ECC: FWAFor(05)05 for information
 - Chaired by ComReg (T. Buckley)
 - ComReg representative (B. O'Dwyer)

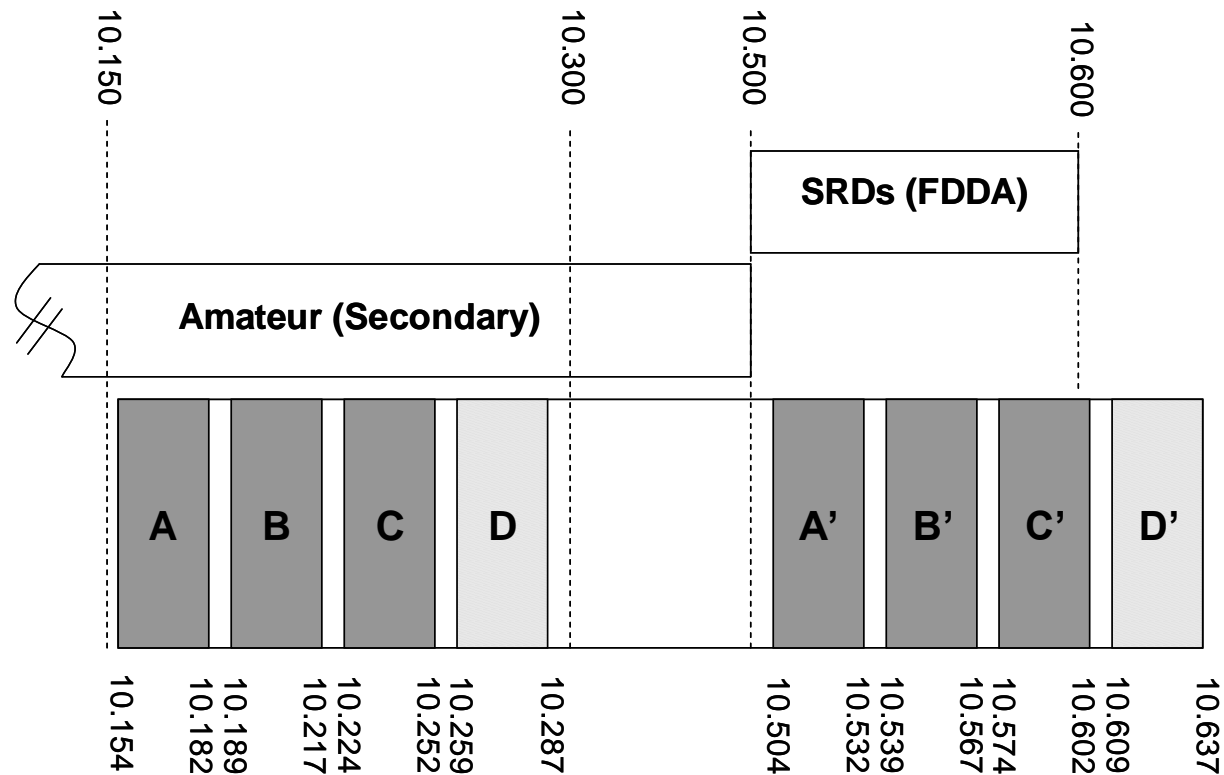
Agenda

FWAFor(05)01

- **Introduction**
- **Update on FWALA Licence Renewals**
- **Update on FWA Broadband Web-Page**
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AOB

- **10.5GHz Additional Channel**
- **26GHz Consultation**



Agenda

FWAFor(05)01

- **Introduction**
- **Update on FWALA Licence Renewals**
- **Update on FWA Broadband Web-Page**
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Closure of the 2nd Meeting of the FWALA Forum

**FWALA – 3.5GHz
Domestic Frequency Coordination**

Licensed Operator Code of Practice

DRAFT

Document History

Draft	Date	Editor	Comment
Version 1.0	04/05/05	FWALA Forum Chair	

DRAFT

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1.2 THE FWALA FORUM 4

1.3 CODES OF PRACTISE 4

1.4 AMENDMENTS TO THE CODE OF PRACTISE..... 5

2 Definitions 6

3 Block Edge Mask..... 7

DRAFT

1 Introduction

1.1 Fixed Wireless Access Local Area

Fixed Wireless Access Local Area (FWALA) is a licensing scheme for the provision of wireless broadband access to end-users. The scheme is available to systems operating in the 3.5GHz, 10.5GHz and 26GHz bands. Licences are issued on a first-come, first served basis and details of the licensing regimes can be found in ComReg document 03/34 and 03/97 for 10.5/26GHz and 3.5GHz respectively.

Licensees are free to deploy equipment under the terms of their FWALA licence within a 'Service Area' specified in the licence and are also responsible for ensuring that any exported interference as a result of these deployments does not exceed a specific level calculated at a fixed distance from the centre of the local area.

As a general policy ComReg will issue licences for wireless systems on a technology neutral basis and this has been the approach under the FWALA scheme.

1.2 The FWALA Forum

A FWALA Forum has been established to address issues of common interest to FWALA licensees and is chaired by ComReg. All FWALA licensees are members of this forum. The FWALA Forum held its first meeting on 24 November 2004.

1.3 Codes of Practice

While every effort has been made by ComReg to minimise the possibility of interference between licensed operators in licensing FWALA systems, it is possible that situations will arise from time to time where it is necessary to coordinate the usage of frequencies between different FWALA networks in order to facilitate the operation of these networks. The FWALA Forum has agreed that the most appropriate way to deal with such instances is by means of a Code of Practice on Domestic Frequency Coordination.

This Code of Practice is based on the following principles:

- It is not possible to provide an environment which is completely free of interference;
- Operators have a number of mitigation options available to deal with interference problems;
- Operators require a level of certainty in frequency planning their network;
- It is not possible to anticipate every possible interference scenario – therefore a pragmatic approach is required;
- Operators with neighbouring networks may arrive at sharing solutions independent of ComReg;
- That a Code of Practice be considered best practise in the absence of any other agreements;

Domestic Frequency Coordination – Code of Practice

- ComReg is responsible for the international coordination of radio systems between the Republic of Ireland and other countries;
- Management of the deployment of network infrastructure, including customer premises equipment, in the service area and within the licensed frequency channel is generally a matter for the operator;
- The local area approach and the requirement to comply with the 30km maximum permissible field strength contour will result in differing EIRP values for base-stations and customer premises equipment deployed within the licensed service area;
- The approach in Ireland should as far as possible take into consideration the approach recommended by CEPT¹;
- That this Code of Practice is a working document and may be subject to review by the FWALA Forum for time to time.

Note that any provision or agreement within a Code of Practice does not absolve a licensee from observing the terms and conditions of any FWALA licence held or from complying with any other statutory obligations.

1.4 Amendments to the Code of Practice

This Code of Practice may be amended as necessary with the agreement of the FWALA Forum and ComReg.

¹ European Conference of Postal and Telecommunications Administrations (www.cept.dk or www.ero.dk)

2 Definitions

[Insert necessary definitions here]

FWALA – Fixed Wireless Access Local Area (S.I. 79 of 2003 as amended)

EIRP – Effective Isotropic Radiated Power [as per Radio Regulations]

DRAFT

3 Block Edge Mask

The spectrum available for licensing in the 3.5GHz band is shown in Figure 1 – specifically frequency channels A, B, C and D. It is noted that guard bands between operators licensed on adjacent frequency channels must be accommodated within the licensed channel of each operator.

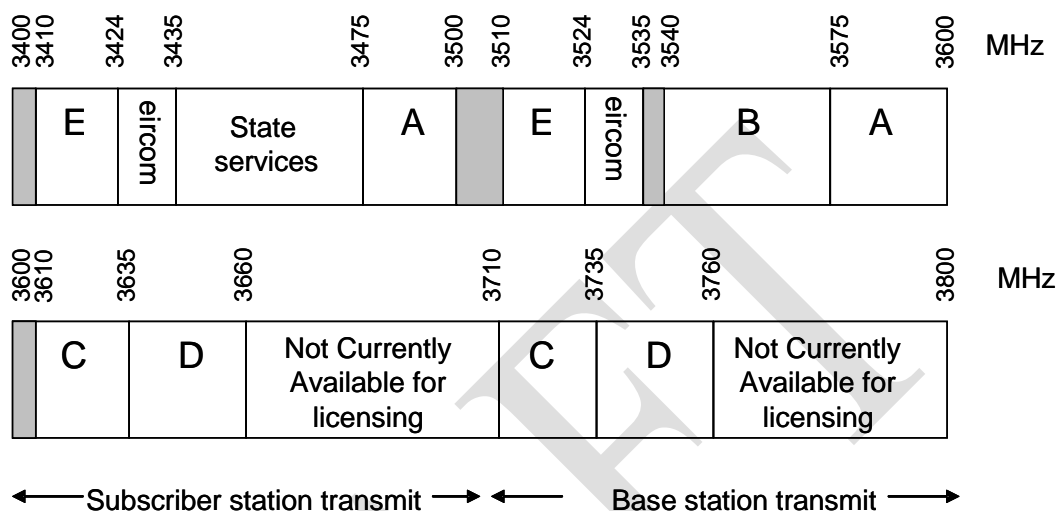


Figure 1 – 3.5GHz Spectrum available under FWALA

As noted previously, FWALA licences are issued on a technology neutral basis and therefore it is certain that systems of differing technical characteristics and deployment will be licensed in adjacent frequency channels.

It is generally recognised, and the FWALA Forum has agreed, that the most spectrally efficient and liberal method to minimise the possibility of interference between operators as a result of emissions from one licensee into a frequency channel licensed to another licensee is to agree a 'Block Edge Mask' common to all licensees. The Block Edge Mask defines the transmission mask in terms of power spectral density (dBW/MHz) at the upper and lower edge of each licensed frequency channel (i.e. A, B, C or D above).

Licensees are also free to reach mutual agreements with other licensees on frequency coordination but the block edge mask will be considered best practise for the resolution of disputes relating to interference between licensees.

To this end, Licensees agree:

- (1) to notify ComReg of any coordination agreement with other licensees;
- (2) to resolve any interference dispute between them. Where resolution can not be agreed ComReg shall mediate on the basis of the dispute resolution procedure agreed by the FWALA Forum [enter document reference – procedure to be developed];
- (3) to a maximum EIRP level from any transmitter of 14dBW/MHz. Please note that this power level is set as an absolute maximum and that

Domestic Frequency Coordination – Code of Practice

licensees must ensure compliance with the $33\text{dB}\mu\text{V}/\text{m}$ signal level limit in accordance with their licence when setting the transmitter power of any transmitter licensed under the FWALA scheme;

- (4) to use of the block edge mask defined in Figure 2;
- (5) that site specific deployments may give rise to technical considerations that cannot be anticipated (e.g. intermodulation products and adjacent spectrum block emissions) which may necessitate specific site engineering solutions and that the licensees will take appropriate action to minimise these.

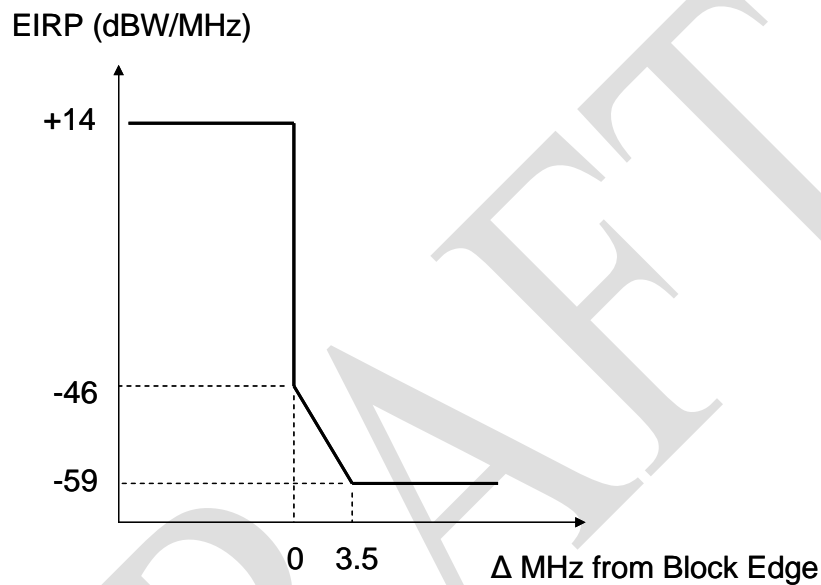


Figure 2: Licensed Frequency Channel Block Edge Mask

Process for Re-assignment of Spectrum – 3.5GHz FWALA

Considering:

1. that the 3.5GHz band is in significant demand for the provision of fixed wireless access services in Ireland;
2. that a licensing scheme is in place for assignment of local area fixed wireless access (FWALA) in the 3.5GHz band (ref. ComReg document 03/97);
3. that the licensing scheme can facilitate a comparative evaluation process based on specific voluntary commitments made by an applicant;
4. that the licensing scheme is on-going and licenses are being issued, where possible, on a first come, first served basis;
5. that maps giving an indication of spectrum availability are maintained in the ComReg web-site being updated from time-to-time as licences are issued;
6. that it may arise that spectrum assigned under the FWALA licensing scheme is returned to ComReg;
7. that there is a need to ensure that all interested parties have an opportunity to apply for spectrum under the licensing scheme on an equitable basis;
8. that there may be significant interest in local areas where previously assigned spectrum becomes available (e.g. dense urban centres);

Where spectrum which has been previously assigned and subsequently becomes available for licensing under the FWALA 3.5GHz licensing regime¹, the following process shall be applicable.

1. ComReg will publish an Information Notice, including publication on the FWA web-page combined with an e-mail shot to FWALA operators, informing interested parties of the spectrum availability and inviting applications for licences in accordance with the guidelines document 03/97 during a specified period of time;
2. All applications received during this specified period of time will be treated as though they arrived at ComReg on the same day and will be treated in accordance with the guidelines document (03/97);
3. Comparative evaluations will be conducted for overlapping² applications on the basis of specific voluntary commitments made by applicants;
4. The voluntary commitments made in the course of the application process shall be included in the licence of successful applicants;
5. Licences shall be offered in accordance with the guidelines;

¹ In accordance with the Fixed Wireless Access Local Area Licence Regulations (S.I. No. 79 of 2003)

² Local areas are considered overlapping where the 30km radius maximum permissible field strength contours overlap

6. Licences shall be issued by ComReg subject to licence offers being accepted and all necessary financial arrangements are made (i.e. payment of spectrum fee and establishment of Performance Bond where necessary);
7. Licence details, including voluntary commitments made by successful applicants, will be published by ComReg in due course.

**Terms of Reference for the new Joint Project Team on
Broadband Fixed Wireless Access including nomadic applications**

1. Study the advantages and disadvantages of the development of a regulatory framework for Broadband Fixed Wireless Access including nomadic applications in the bands 5725 – 5875 MHz and 3400 – 3800 MHz, taking account of the existing ECC deliverables and the needs of existing services:
 - the draft ECC Report '*compatibility studies in the band 5725 – 5875 MHz between Fixed Wireless Access (FWA) systems and other systems*' the completion of which is within the mandate of SE38;
 - the draft ECC Recommendation on FWS systems in the band 3.4 – 3.8 GHz band, the completion of which is within the mandate of SE19;The deliverable for this study will be an analysis, which may include economic aspects, of the possible actions, e.g. an ECC Decision, ECC Recommendation, entry in the ECA, or no action, for consideration by WG FM.
2. On completion of the work of SE38, consider the results of measurement campaigns and other technical issues related to Dynamic Frequency Selection (DFS) in the band 5725 - 5875 MHz band.
3. Following guidance from WG FM, based on discussion of the result of item 1, develop the appropriate regulatory framework to fulfill the requirements for Broadband Fixed Wireless Access including nomadic applications.
4. Bands additional to the ones referred to in No.1 may only be studied after further direction from the ECC
5. Finalisation of the work is foreseen during the ECC meeting held Spring 2006.

Notes:

These terms of reference are provided by the ECC to allow the work to start immediately. Future revision of the ToR is under joint responsibility of WG FM and WG SE.

This work requires close co-operation with ETSI BRAN and ETSI TM 4.

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E-mail : Tony.buckley@comreg.ie

**FWALA Forum
2nd Meeting
5th May 2005 / 10.00am – 1.00pm
Venue: Gresham Hotel**

Attendees:

Name	Organisation
Brian O'Dwyer (Chairman)	ComReg
Jim Connolly	ComReg
Mark O'Raw	High Speed Data Solns
AJ Cahill	Airspeed Comms
Tadhg O'Toole	Budget Wireless
Ruairi Jennings	Irish Broadband
Mike Stacey	Irish Broadband
Brent Smith	Clearwire Ireland
Dan Churchill	Clearwire Ireland
Willie Fagan	Chorus
Jim Digby	Chorus
Umberto Bini	Chorus
Cyril Moriarty	Last Mile Wireless
John Gibbons	Last Mile Wireless

Apologies:

Name	Organisation
Colm Piercy	Digiweb
Ed Diggin	Real Broadband

Adoption of the Agenda:

The Forum adopted the agenda as shown in Annex 1 with a request from Ruairi Jennings to have a discussion re. Channel E under 'AOB'.

Introduction:

Round table introductions were made considering the attendance of new Forum members.

No comments were received on the notes of the 1st meeting of the forum. The notes from the 1st meeting were approved. One action on ComReg remained outstanding since the last forum on the development of a 'Forum Web-page'.

Update on FWALA Licence Renewals:

ComReg gave an update on the progress of the Phase 1 licence renewals and indicated that 36 licences had been renewed from 37 licences for which renewal was due. Jim Digby requested clarification on the reason for non-renewal and was informed by ComReg that non-renewal in this instance was following continued non-compliance with licence conditions, in particular, failure to establish service. AJ Cahill questioned the integrity of the licence competition where licences with any non-compliance were renewed. ComReg responded that licensees were given a fair and proportionate opportunity to comply with licence conditions and where continued non-compliance was found, licence renewals were not granted.

In-line with a prior commitment made by ComReg to publish the voluntary commitments made by applicants under Phase 1 of the licensing scheme ComReg circulated document FWAFor(05)02 summarising the Phase 1 voluntary commitments. ComReg informed the meeting that these details would be published on the ComReg web-page on Friday 6th May. John Gibbons expressed concern that the published information may give 'the wrong impression' to consumers on company tariffing. ComReg indicated that its intention on this occasion was to fulfil its commitment to publish the voluntary commitments made and used in the Phase 1 comparative evaluation. Consumers are free to investigate complete service tariff information on individual company web-sites for which links are already provided on the ComReg web-site. Some discussion was had on the availability of specific committed tariff information on individual company web-sites. This discussion was taken off-line for ComReg to provide relevant URLs to interested parties.

ComReg informed the meeting that the processing of FWALA licence applications and renewal was being transferred to the 'Licensing Operations' section in ComReg.

Update on FWA Broadband Web-Page:

ComReg informed the meeting that the FWA Broadband web-page had been updated to reflect recent licence awards. ComReg called for comments on the site content and presentation of information given that the page now appeared to be used by a wider audience than it had originally been designed for. Various suggestions were made, one operator requested more information to be made available while others felt there was an adequate amount of information currently available. Willie Fagan noted the availability of software to better display the geographic detail of the current licences. In general the consensus was for a list of general details (e.g. town name) or coordinates of the local area centres to be made available to the Forum.

Procedure for Re-assignment of Spectrum

ComReg presented document FWAFor(05)04 for the information of the Forum on the procedure which ComReg shall employ for the re-assignment of spectrum in the 3.5GHz band. An information notice calling for applications under this procedure for Channel B in the Limerick and north Kerry will issue in the coming weeks.

Domestic Frequency Coordination

At the last meeting the Forum agreed that Code(s) of Practice (CoP) are an appropriate tool for dealing with domestic frequency coordination and that a 'Block Edge Mask' is the most flexible approach for accommodating guard bands between adjacent spectrum users under the FWALA licensing scheme.

ComReg presented document FWAFor(05)03, a draft CoP on Domestic Frequency Coordination for comment from the Forum. The meeting agreed to the general format of the CoP and agreed to review the specific values of the proposed 'Block Edge Mask' and to submit comments by the end of June '05. The meeting requested the background documentation on the block edge mask. ComReg indicated that the mask was based on a draft CEPT recommendation (ECC/REC(04)05) and Ofcom guidance document both of which were based in ECC Report 33. Copies of these documents will be made available to the Forum. The meeting queried when the CEPT recommendation was due for adoption by CEPT. ComReg agreed to investigate the road map for adoption of the recommendation.

Action: Forum to comment on draft CoP by end June '05;

ComReg to circulate CEPT documentation and Ofcom Guidance document;

John Gibbons raised the issue of possible unlicensed use of equipment in the 3.650GHz band as a result of the FCC proposing an exemption for this band in the US. ComReg indicated that the R&TTE Directive is the primary tool for restricting the placing on the market and putting into service of radio equipment in Ireland.

The Forum had a discussion on the topic of the coordination of operators licensed for the same spectrum in adjacent geographic areas. This discussion centred on options to maximise the use of spectrum and particularly to address, as far as possible, any 'dead zones' between licensed local areas. The main points raised were:

- The use of Channel E on an ad-hoc basis to 'fill-in' dead zones between licensed areas. ComReg indicated that Channel E was earmarked for expansion spectrum but would be reviewed in the coming months;
- The possibility of granting licences which would 'over-lap' an adjacent licensed area with additional restrictions (e.g. specify one sector) to mitigate against interference into the adjacent system. This approach would reduce the problem of 'dead zones' between local areas but may reduce the flexibility the licensee has to deploy within the reduced service area. Some operators expressed a reluctance to have the current flexibility to deploy within the licensed service area reduced. A similar approach but based on licence exempt deployment (within 3.5GHz) was suggested. While this may grant greater flexibility ComReg emphasised the need for any solutions to fall within the licensed framework;
- Introduce flexibility in the licensed 'Service Areas' to allow amalgamation of service areas where one operator is licensed for a 'cluster' of local areas;
- Reduction of the 'interference zone' where a service area of <15km is licensed.

Action: ComReg to produce a document to further develop these options

Willie Fagan queried whether the implementation of such options would require public consultation. ComReg's preferred approach, where possible, would be to detail any changes in the coordination of licences in an Information Notice with an appropriate revision to the Guidelines document.

CEPT Joint Project Team BWA

For the information of the Forum ComReg gave background on and details of the Terms of Reference of a new joint project team within CEPT looking at the pro's and con's of a regulatory framework for Broadband Fixed Wireless Access. This group will be chaired by ComReg's Tony Buckley and ComReg will be represented by Brian O'Dwyer. ComReg agreed to keep the Forum informed of any developments within the new JPT BFWA.

Any other Business (AOB)

ComReg indicated its intention to make further spectrum available in the 10.5GHz band for the FWALA scheme.

Ruairi Jennings queried the availability of Channel E and what its future status may be. ComReg indicated that it intends to review all remaining spectrum in the 3.5GHz band including Channel E in the coming months. Any proposed change in the current

designation of spectrum in the band following a review will require public consultation.

Date of Next Meeting

The date of the next meeting was provisionally set for Thursday 11th August (10am – 1pm).

Brian O'Dwyer
Chairman
FWALA Forum
20 June 2005

Annex 1



FWALA Operator's Forum
2nd Meeting
10.00am, 5th May, 2005
At the Gresham Hotel, O'Connell St, Dublin

Agenda

1. Introductions
2. Update on FWALA Licence Renewals
3. Update of the FWA Broadband web-page
4. Procedure for Re-Assignment of Spectrum
5. Domestic Frequency Coordination
6. CEPT Joint Project Team on BWA
7. Date for next Forum Meeting
8. AOB

Annex: 3 Meeting 3, August 11 2005



FWALA Operator's Forum
3rd Meeting
10.00am, 11th August, 2005
At the Gresham Hotel, O'Connell St, Dublin

Agenda

1. Introduction

- a. House Keeping
- b. Approval of Agenda
- c. Round-table Introductions & Apologies (Ed Diggin, Willie to arrive at 11am)
- d. Confidentiality of information shared in the Forum – to facilitate frank exchanges of information etc.
- e. Approval of Minutes/Review of Action Points

2. FWALA Forum Web-Page

- a. Presentation of Web-Pages
- b. Proposal to trial for a week – suggestions on functionality welcome – Go-Live date: Monday 22 August

- Coffee Break 11am -

3. FWALA Licensing Process (Licensing Operations)

- a. Margaret O'Sullivan (Licensing Operations) presents on Licensing Process

4. Domestic Frequency Coordination

- a. Review of Draft CoP – FWAFor(05)03 – No comments received, seek approval
- b. Presentation of proposals re licensing for consultation document

5. Update re. CEPT - JPT BFWA

- a. Outline of Draft Report and date of next meeting (31st Aug – 2nd Sept)

6. Date for next Forum Meeting

- a. Proposal – 17th November/18th November

7. AOB

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Commission for
Communications Regulation

FWALA FORUM August 11th 2005

FWALA Licence Processing

Licensing Operations

Objective: Outline ComReg's FWALA Licensing Process

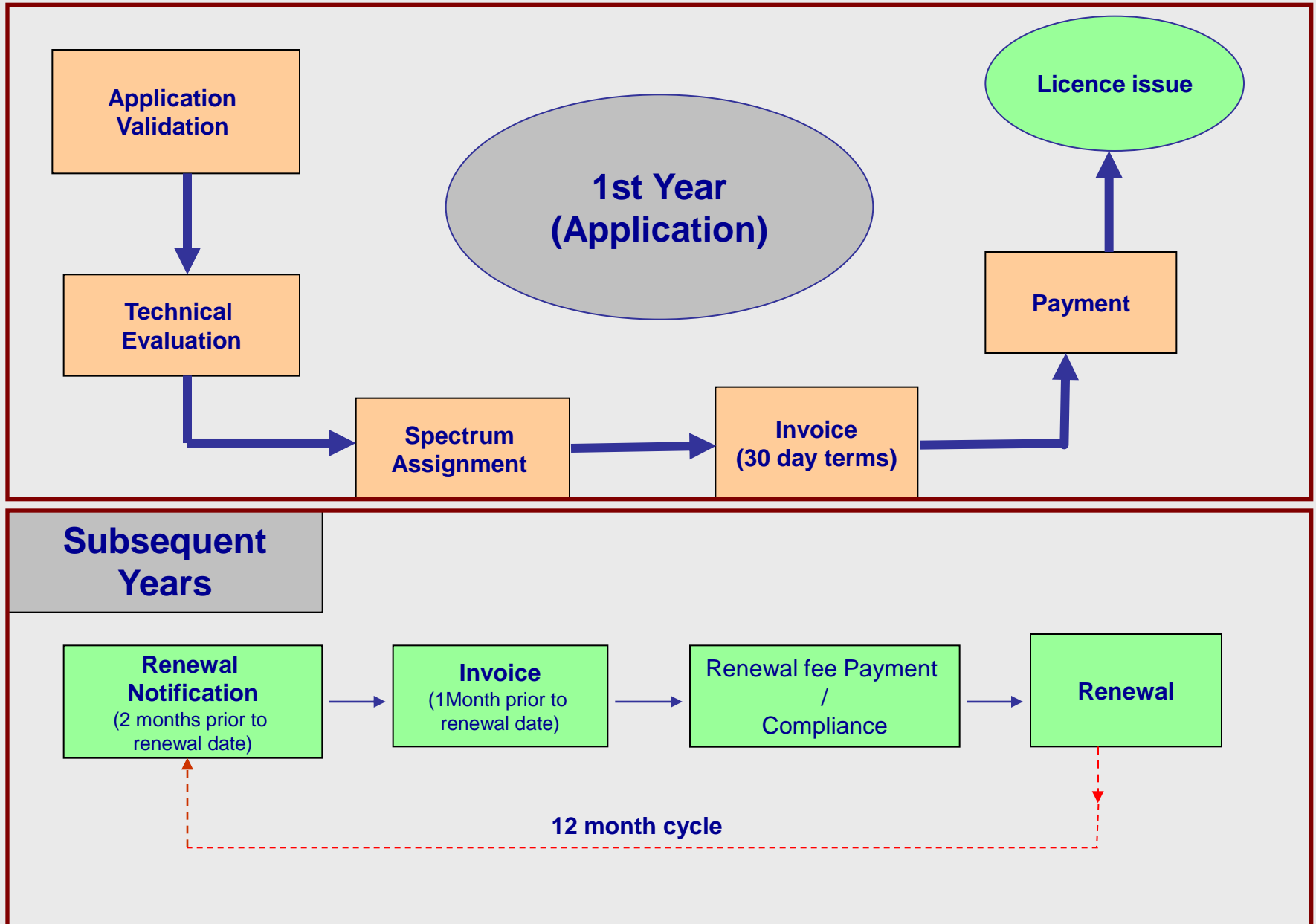
- **Illustrate the FWALA process**
 - Licensing Overview
 - Processing of New Applications (First Come, First Served)
 - The Renewals Process

- **Overview of Payment Options**

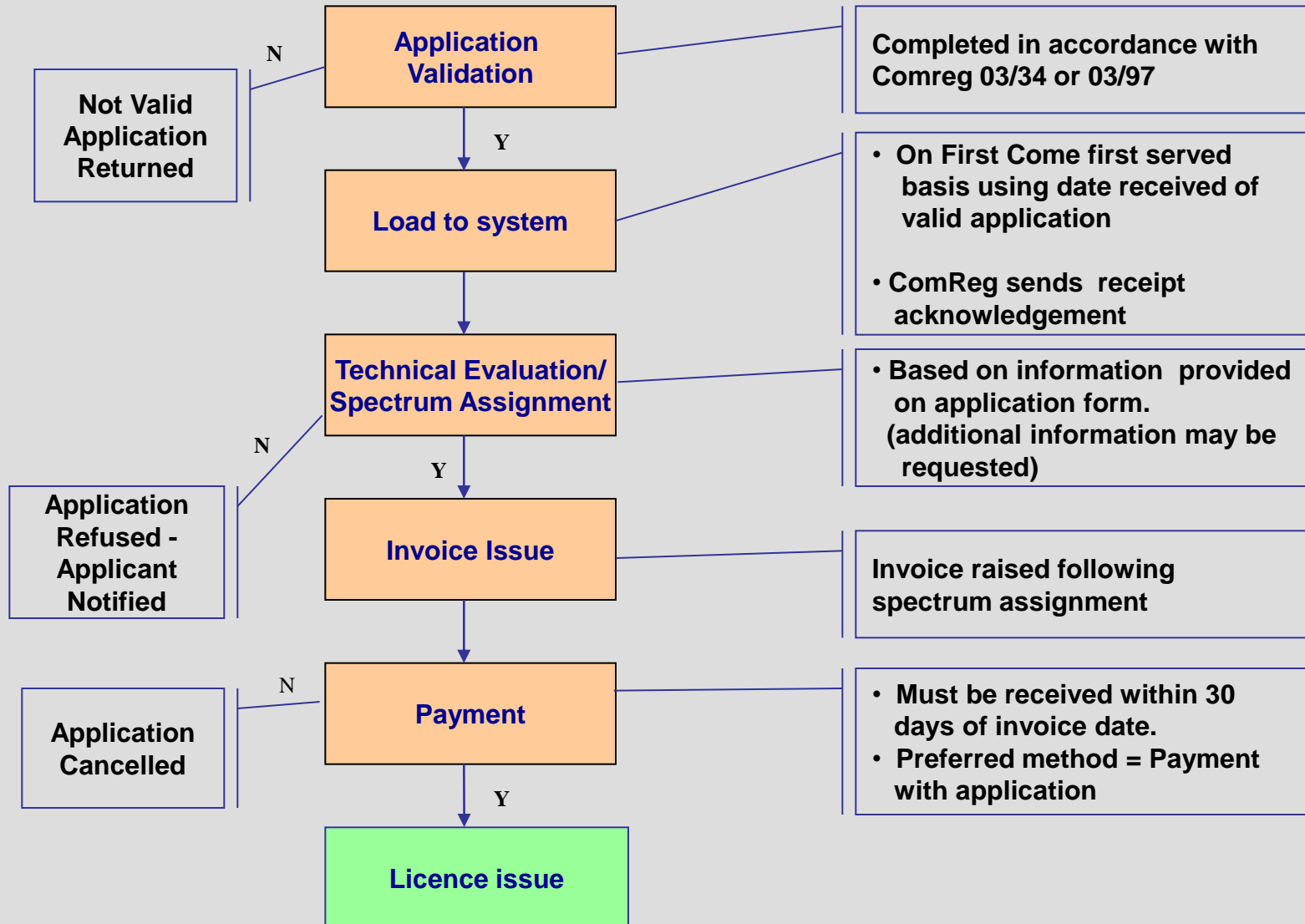
- **Overview of Point to Point Radio Link Licence process**

- **Q & A**

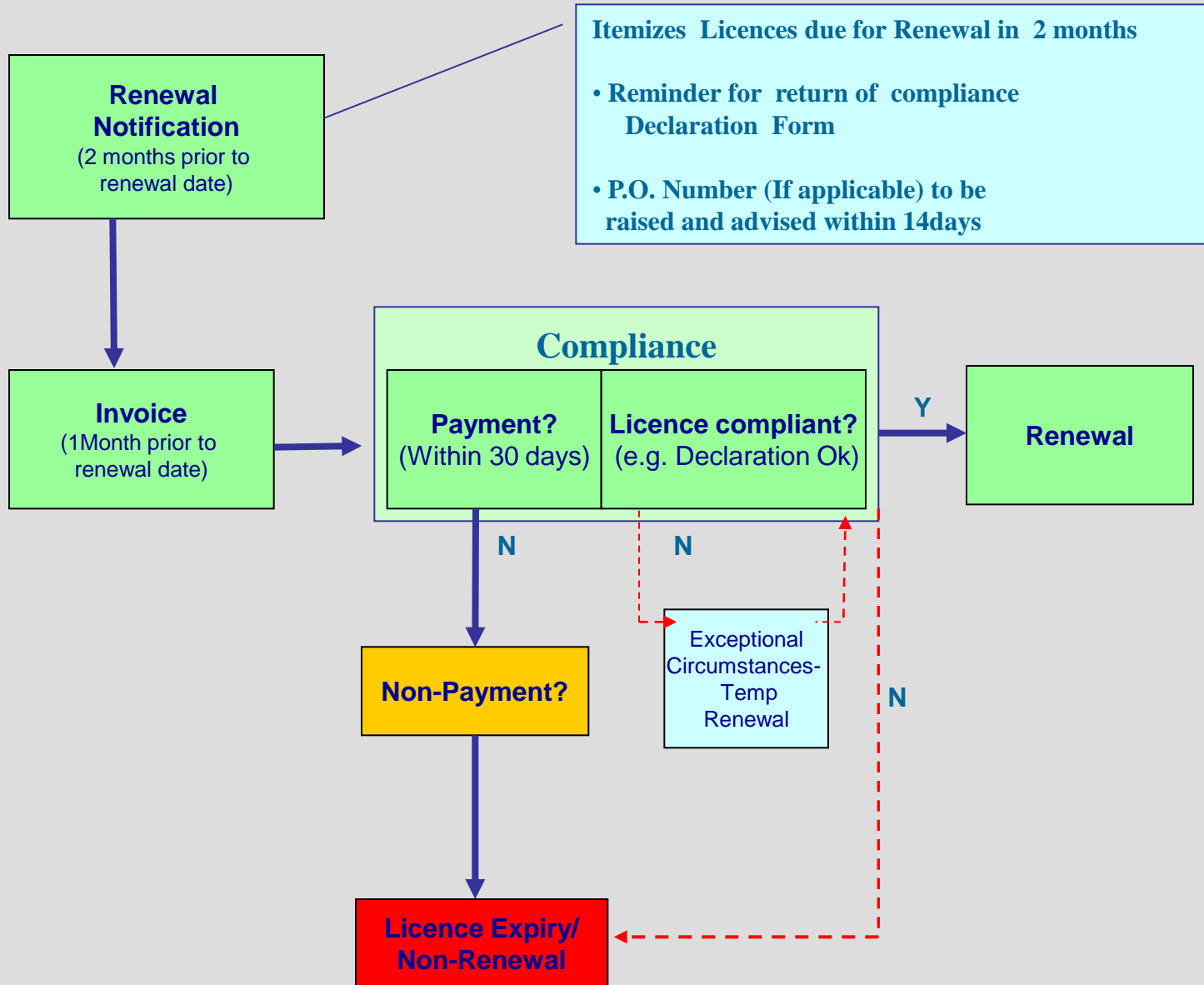
Licensing Process Overview



The Application Process (Both 3.5GHz & 10.5 GHz & 26 GHz)



FWALA Licence Renewal Steps



Who Does What?

Main FWALA contact

Brian O'Dwyer

Licence Processing

➤ **Admin Processing:**

Licensing Division:
Margaret O'Sullivan

- Application Validation & Loading.
- Invoicing & Licence Issue
- Licence Maintenance / Renewals

➤ **Technical processing:**

Licensing Division
Kenny Concannon
Joey O'Sullivan

- Application Evaluation
- Spectrum Management
/Assignment

➤ **Finance:**

Siobhan Dalton
Velma Galligan.

- Payment Follow Up
- Account Set-up & Management

Overview of Payment Options

- **An Account with ComReg:**

- ✓ Maintained in credit, from which:
New Application, Processing or Licence renewal fees can be drawn down
- ✓ Please contact Finance to set-up.

- **Other Payment options:**

- Bank Draft /EFT /Cheque/ Credit Card

- **On-line (E-Payment):**

- Use Account number and PIN to enter.
- Laser / Credit card payment

www.licensing.comreg.ie

Regardless of the option employed, all requests for payment are bound by ComReg's 30 day payment terms and appropriate licence conditions.

Overview of Point to Point Radio Link Licensing

- **Similar process:**

- Validation, Evaluation and Financial elements

- **ComReg Documents:**

- Application Form (ComReg98/15R3)
- Guidelines Document (ComReg 98/14R3)

- **Information available on ComReg website**

<http://www.comreg.ie/sector/default.asp?S=4&NavID=139&M=#100143>

Essential Requirements of Link Licensing Process:

▪ **Valid Application:**

- Completed, signed hardcopy of Application Form(ComReg98/15R3) - Completed in accordance with the ComReg Guidelines Document (ComReg 98/14R3)
- Annex 1 (of Application Form) in .anx format submitted to:
Links.anx@comreg.ie
- Processing fee (€12.00 per link) to be arranged in advance or to accompany application.

▪ **Licence Issue:**

- Full payment of the appropriate fee.

Further information:

<http://www.comreg.ie/sector/default.asp?S=4&NavID=139&M=#100143>

Useful Contacts: FWALA / Link Licensing

- **Applications:**

FWALA;

**Margaret O'Sullivan
(Licensing Operations)**

Point to Point Radio Links:

Hardcopy

Licensing Division, ComReg

.anx submission;

Links.anx@comreg.ie

- **Payments:**

- E-Payments;

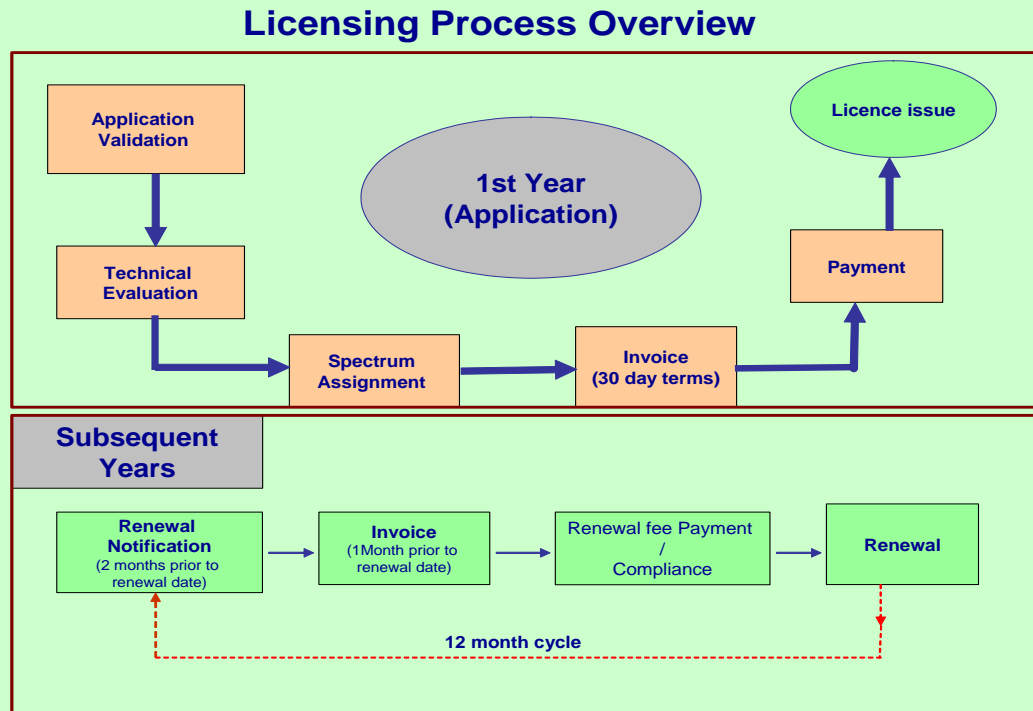
www.elicensing.comreg.ie

- All other;

Finance Division

Summary

- Outlined FWALA Licensing Process



- Introduced Licensing / Finance contacts
- Point to Point Link Licensing process described

Thank You for Your Attention

Q & A

www.comreg.ie



Commission for
Communications Regulation

FWALA Operator's Forum

3rd Meeting

11 August 2005

Agenda

FWAFor(05)07

- **Introduction**
- **FWALA Forum Web-Page**
- **FWALA Licensing Process – Licensing Ops**
- **Domestic Frequency Coordination**
- **Update re. CEPT – JPT BFWA**
- **Date for Next Meeting**
- **AOB**

Introduction

- **House Keeping**
- **Introductions & Apologies**
- **Review of Previous Minutes (FWAFor(05)06)**
 - No comments Rec'd
 - Actions:
 - Development of Forum Web-Page (ComReg)
 - Call for comments on draft CoP (All)
 - ComReg to circulate reference info relating to CoP (ComReg)
 - Development of Options regarding licensing options (ComReg)

FWALA Forum Web-Page

- **FWAFor(04)04 – ComReg agree to develop Forum web-page**
 - Technical Contact info – Frequency Coordination
 - 'Going-Live' Database
 - Meeting Documentation incl. Codes of Practise
 - International Coordination tool – *under development*

- **Presenting:**

www.comreg.ie/FWALAForum

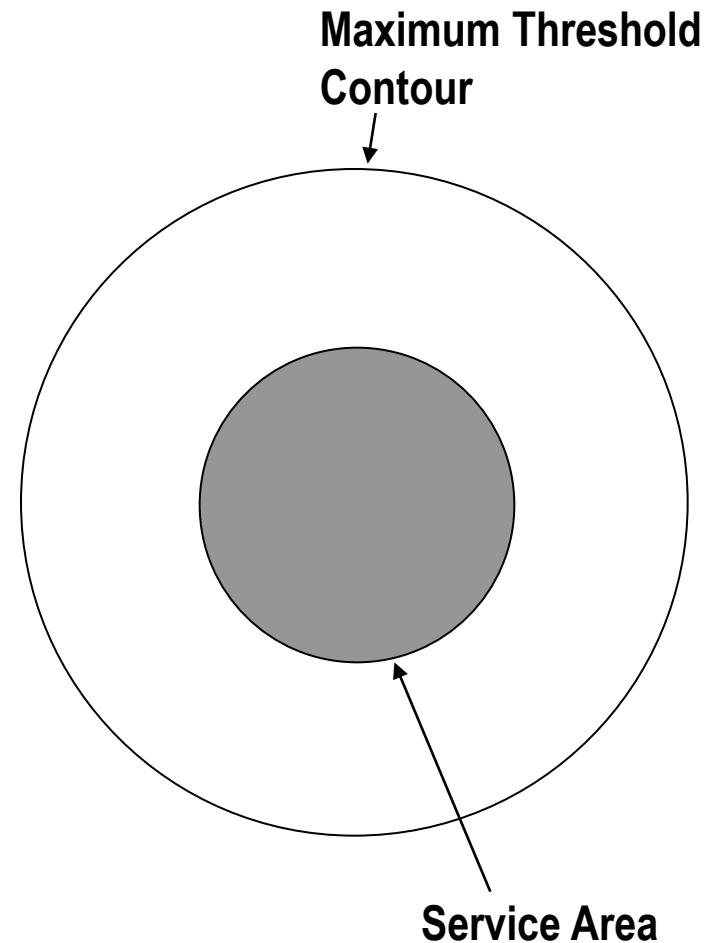
Domestic Frequency Coordination

- **Review of Draft CoP – FWAFor(05)03**
 - No Comments rec'd
 - Approval of CoP
- **Proposals for Licensing – “Other Scenarios”**

Domestic Frequency Coordination

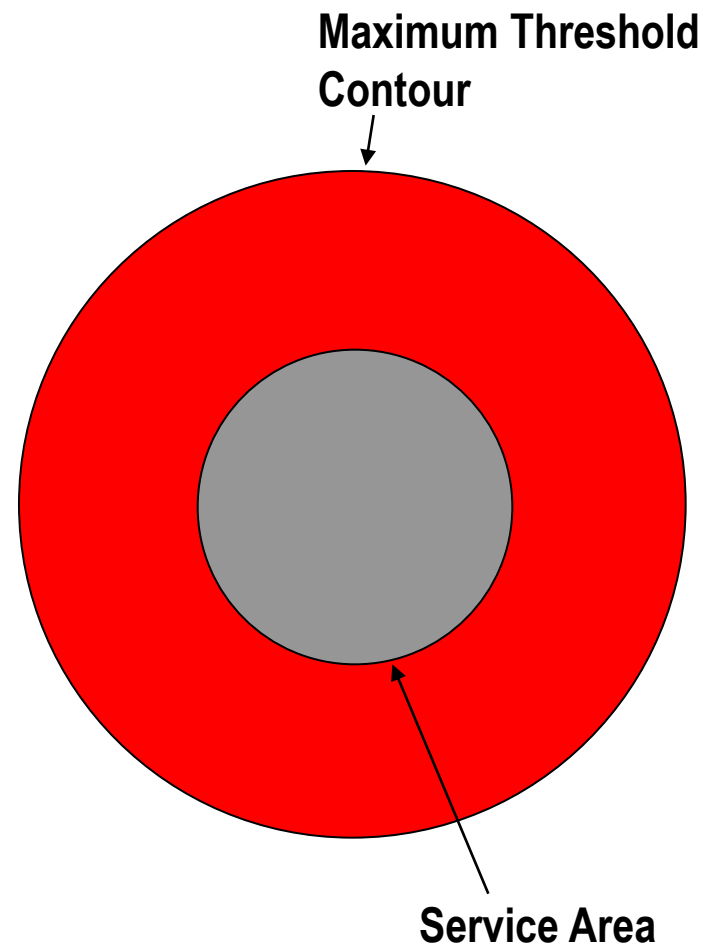
■ **Proposal:**

- Permit CPE deployment in area outside service area but within Max. Threshold Contour on a licence exempt basis



Domestic Frequency Coordination

- **Proposal (1):**
 - Permit CPE deployment in area outside service area but within Max. Threshold Contour on a licence exempt basis
- **Some Conditions:**
 - Location
 - Max threshold Contour stands
 - Non-interference, non-protected
 - Consumer-focused ground-rules



Domestic Frequency Coordination

- **Pros:**

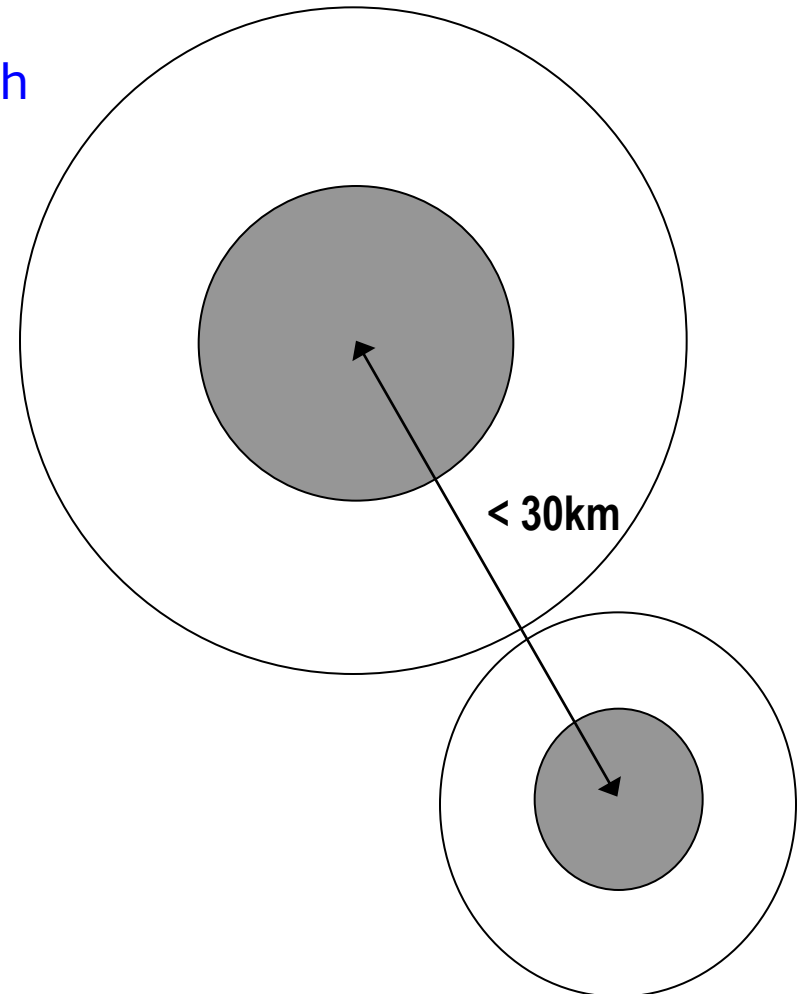
- Will extend potential subscriber base
- Will allow opportunity to fill some 'dead zones'

- **Cons:**

- Exempt CPEs – non-interference, non-protected
- No guarantee of QoS possible – Strong Consumer Ground Rules
- Potential for ambiguity regarding interference

Domestic Frequency Coordination

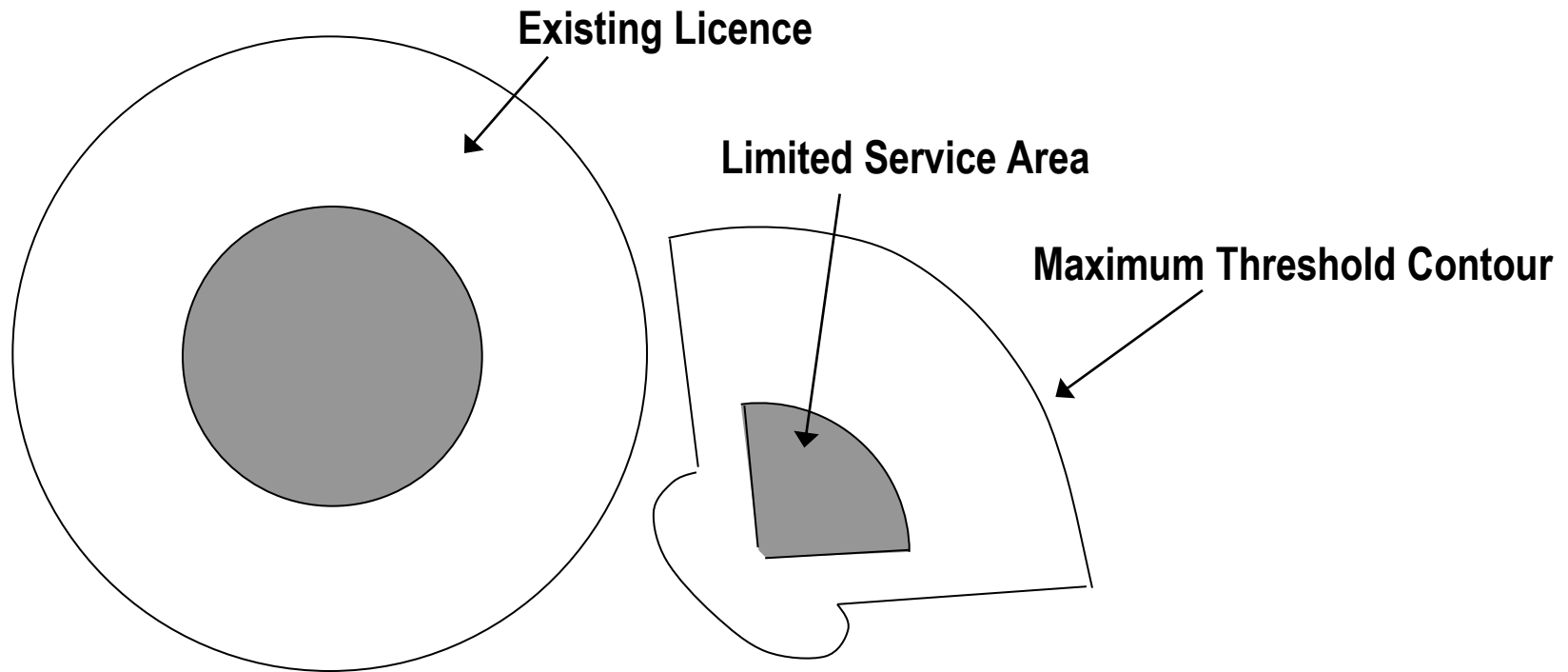
- **Proposal (2):**
 - Reduced Interference Zone with reduced Service Area (at the request of the applicant/licensee)
- **Pros:**
 - May facilitate licensing where currently it would not be possible
- **Cons:**
 - May remove opportunity to expand geographically
 - Risk of interference from adjacent licences



Domestic Frequency Coordination

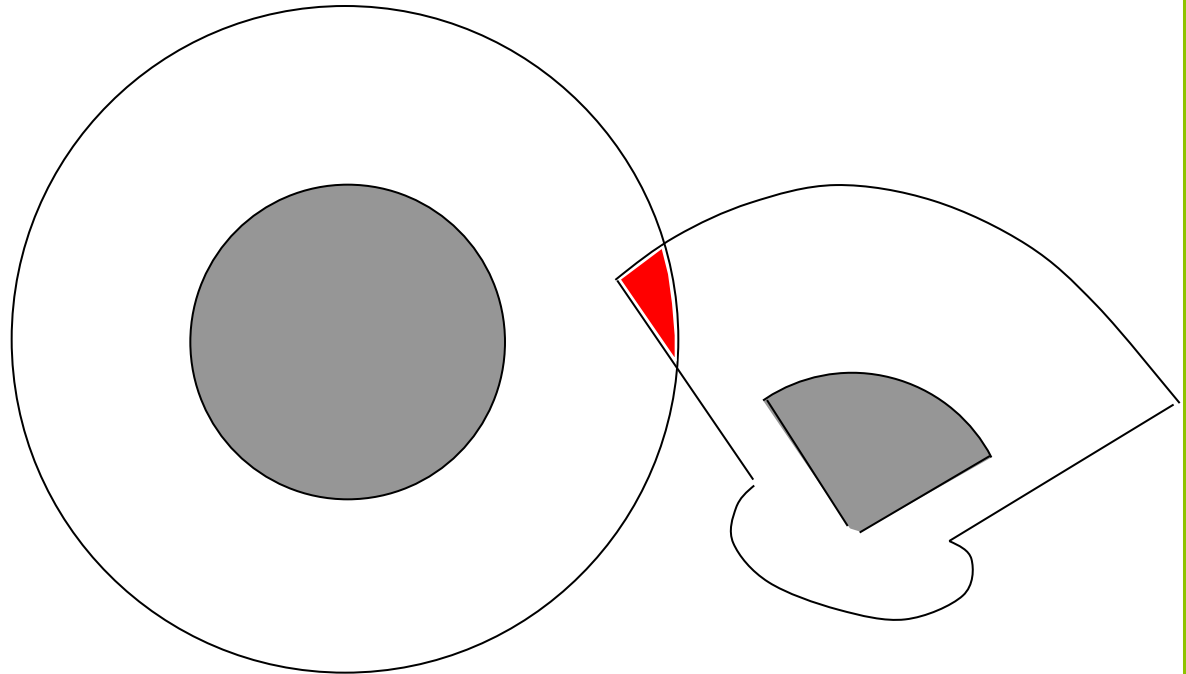
▪ **Proposal (3):**

- Develop a framework for limited/restricted licences e.g. a single sector licence – based on exact deployment details



Domestic Frequency Coordination

- **Maximum Threshold Contour – ETSI Sectoral RPE**
- **Possible Co-ordination agreements**
- **Limited Licence must be:**
 - Definable
 - Measurable



Domestic Frequency Coordination

- **Pros**

- Opportunity to extend the availability of services under FWALA scheme
- Maximise the efficient use of the spectrum

- **Cons**

- Limited Licences may not have the flexibility of current licences

CEPT – JPT BFWA

- **Project Team last met 28/29 June**
- **Primary Output – Skeleton Report**
 - Spectrum Sharing Issues
 - Economic Considerations
 - Regulatory Considerations
- **Next Meeting: 31 Aug-2 Sept**

Date for Next Meeting and AOB

- **Proposal: 17th November**

**FWALA – 3.5GHz
Domestic Frequency Coordination**

Licensed Operator Code of Practice

DRAFT

Document History

Draft	Date	Editor	Comment
Version 1.0	04/05/05	FWALA Forum Chair	
<u>Version 1.1</u>	<u>10/08/05</u>	<u>FWALA Forum Chair</u>	
<u>Version 1.2</u>	<u>15/08/05</u>	<u>FWALA Forum Chair</u>	<u>For review; Comments called for, to be received before 29 August, 2005</u>
<u>Version 1.3</u>	<u>14/06/06</u>	<u>FWALA Forum Chair</u>	<u>Inserted Bcloak Edge Mask agreed at 3rd FWALA Forum meeting</u>

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Contents

1 Introduction 4

 1.1 FIXED WIRELESS ACCESS LOCAL AREA..... 4

 1.2 THE FWALA FORUM 4

 1.3 CODES OF PRACTISE 4

 1.4 AMENDMENTS TO THE CODE OF PRACTISE..... 5

2 Definitions 6

3 Block Edge Mask 7

DRAFT

1 Introduction

1.1 Fixed Wireless Access Local Area

Fixed Wireless Access Local Area (FWALA) is a licensing scheme for the provision of wireless broadband access to end-users. The scheme is available to systems operating in the 3.5GHz, 10.5GHz and 26GHz bands. Licences are issued on a first-come, first served basis and details of the licensing regimes can be found in ComReg document [03/3406/17](#) and [03/9706/17a](#) for 10.5/26GHz and 3.5GHz respectively.

Licensees are free to deploy equipment under the terms of their FWALA licence within a 'Service Area' specified in the licence and are also responsible for ensuring that any exported interference as a result of these deployments does not exceed a specific level calculated at a fixed distance from the centre of the local area.

As a general policy ComReg will issue licences for wireless systems on a technology neutral basis and this has been the approach under the FWALA scheme.

1.2 The FWALA Forum

A FWALA Forum has been established to address issues of common interest to FWALA licensees and is chaired by ComReg. All FWALA licensees are members of this forum. The FWALA Forum held its first meeting on 24 November 2004.

1.3 Codes of Practice

While every effort has been made by ComReg to minimise the possibility of interference between licensed operators in licensing FWALA systems, it is possible that situations will arise from time to time where it is necessary to coordinate the usage of frequencies between different FWALA networks in order to facilitate the operation of these networks. The FWALA Forum has agreed that the most appropriate way to deal with such instances is by means of a Code of Practice on Domestic Frequency Coordination.

This Code of Practice is based on the following principles:

- It is not possible to provide an environment which is completely free of interference;
- Operators have a number of mitigation options available to deal with interference problems;
- Operators require a level of certainty in frequency planning their network;
- It is not possible to anticipate every possible interference scenario – therefore a pragmatic approach is required;
- Operators with neighbouring networks may arrive at sharing solutions independent of ComReg;
- That a Code of Practice be considered best practise in the absence of any other agreements;

Domestic Frequency Coordination – Code of Practice

- ComReg is responsible for the international coordination of radio systems between the Republic of Ireland and other countries;
- Management of the deployment of network infrastructure, including customer premises equipment, in the service area and within the licensed frequency channel is generally a matter for the operator;
- The local area approach and the requirement to comply with the 30km maximum permissible field strength contour (12km maximum permissible field strength contour for the 26GHz band) will result in differing EIRP values for base-stations and customer premises equipment deployed within the licensed service area;
- The approach in Ireland should as far as possible take into consideration the approach recommended by CEPT¹;
- That this Code of Practice is a working document and may be subject to review by the FWALA Forum for time to time.

Note that any provision or agreement within a Code of Practice does not absolve a licensee from observing the terms and conditions of any FWALA licence held or from complying with any other statutory obligations.

1.4 Amendments to the Code of Practice

This Code of Practice may be amended as necessary with the agreement of the FWALA Forum and ComReg.

¹ European Conference of Postal and Telecommunications Administrations (www.cept.dk or www.ero.dk). Reference ERC/REC 14-03 and ECC Report 033.

2 Definitions

~~[Insert necessary definitions here]~~

FWALA – Fixed Wireless Access Local Area (S.I. 79 of 2003 as amended)

EIRP – Effective Isotropic Radiated Power: The product of the power supplied to the antenna and the antenna gain in a given direction relative to an isotropic antenna (absolute or isotropic gain)² [as per Radio Regulations]

DRAFT

² Ref: Article 1.161 of the Radio Regulations, Edition of 2004

3 Block Edge Mask – 3.5GHz Band

The spectrum available for licensing in the 3.5GHz band is shown in Figure 1 – specifically frequency channels A, B, C and D. It is noted that guard bands between operators licensed on adjacent frequency channels must be accommodated within the licensed channel of each operator.

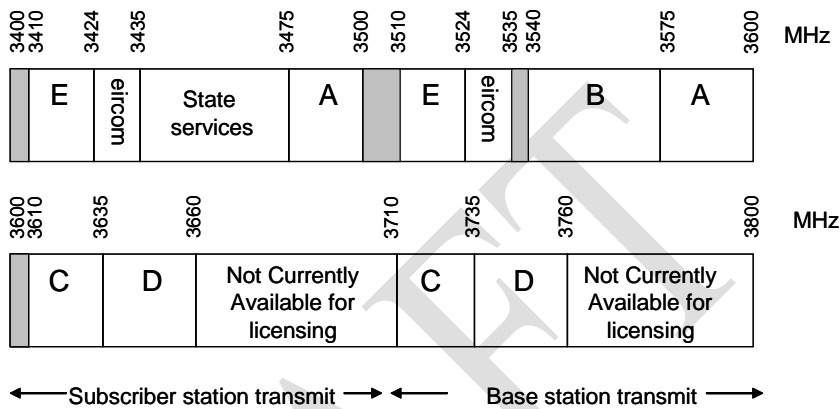


Figure 1 – 3.5GHz Spectrum available under FWALA

As noted previously, FWALA licences are issued on a technology neutral basis and therefore it is certain that systems of differing technical characteristics and deployment will be licensed in adjacent frequency channels.

It is generally recognised, and the FWALA Forum has agreed, that the most spectrally efficient and liberal method to minimise the possibility of interference between operators as a result of emissions from one licensee into a frequency channel licensed to another licensee is to agree a 'Block Edge Mask' common to all licensees. The Block Edge Mask defines the transmission mask in terms of power spectral density (dBW/MHz) at the upper and lower edge of each licensed frequency channel (i.e. A, B, C or D above).

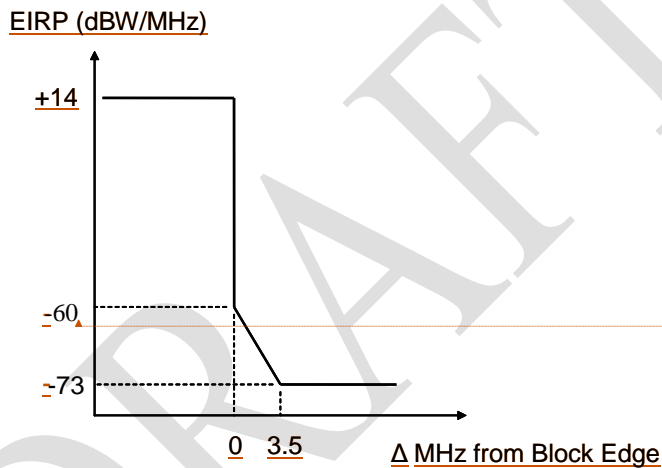
Licensees are also free to reach mutual agreements with other licensees on frequency coordination but the block edge mask will be considered best practise for the resolution of disputes relating to interference between licensees.

To this end, Licensees agree:

- (1) to notify ComReg of any coordination agreement with other licensees;
- (2) to resolve any interference dispute between them. Where resolution can not be agreed ComReg shall mediate on the basis of the dispute resolution procedure agreed by the FWALA Forum ~~[enter document reference]~~ ~~procedure to be developed~~;

Domestic Frequency Coordination – Code of Practice

- (3) to a maximum EIRP level from any transmitter of 14dBW/MHz. Please note that this power level is set as an absolute maximum and that licensees must ensure compliance with the 33dBμV/m signal level limit in accordance with their licence when setting the transmitter power of any transmitter licensed under the FWALA scheme;
- (4) to use of the block edge mask defined in Figure 2 at the lower and upper edge of their licensed spectrum;
- (5) that site specific deployments may give rise to technical considerations that cannot be anticipated (e.g. intermodulation products and adjacent spectrum block emissions) which may necessitate specific site engineering solutions and that the licensees will take appropriate action to minimise these.



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Figure 2: Licensed Frequency Channel Block Edge Mask³

³ Ref: [ECC Report 033 and Draft ECC/REC/\(04\)05](#)

FWALA Operator's Forum
3rd Meeting
11th August 2005 / 10.00am – 12.30pm
Venue: Gresham Hotel

Attendees:

Name	Organisation
Brian O'Dwyer (Chairman)	ComReg
Jim Connolly	ComReg
Margaret O'Sullivan	ComReg
Kevin Kennedy	ComReg
Mark O'Raw	High Speed Data Solns
Liam O'Kelly	Airspeed Comms
John Quinn	Digiweb
Ruairi Jennings	Irish Broadband
Mike Stacey	Irish Broadband
Michael Steward	Irish Broadband
Brent Smith	Clearwire Ireland
Brefne Sweeney	Clearwire Ireland
Willie Fagan	Chorus
Umberto Bini	Chorus

Apologies:

Name	Organisation
Ed Diggin	Real Broadband

Adoption of the Agenda:

The Forum adopted the agenda as shown in Annex 1.

Introduction:

Round table introductions were made.

The chairman re-iterated the importance of the confidentiality of discussions within the Forum. In order to facilitate frank exchanges of information and opinions, which is paramount to the success of the Forum, discussions within the forum should not be reported to the public media without the agreement of the Forum itself.

No comments were received on the notes of the 2nd meeting of the forum. The notes from the 2nd meeting were approved. All actions from the 2nd meeting have been discharged.

FWALA Forum web-page:

During the first meeting of the FWALA Forum ComReg agreed to develop a 'Forum-only' web-page to facilitate the work of the Forum. The pages were to include:

- Contact List (incl. technical contacts);
- 'Going-live' local area database;
- Meeting document server;
- International coordination tool.

ComReg introduced a number of web-pages developed since the last meeting to meet the Forum's requirements. The chair emphasised that the pages had been developed at the request of the Forum and that the usefulness of the pages was dependent on the input of information by the licensees. ComReg also highlighted that the pages would not be used for regulatory purposes such as licence compliance, etc., and that licensees would still be required to complete all the usual licensing processes, etc.

ComReg went on to demonstrate the functionality of the web-pages and highlighted that the tool relating to International Coordination was still under development. The information relating to licences was entirely fictional and was provided on the web-page only for the purposes of trialling the site. Licensees were asked to provide information relating to technical contacts and to review information relating to contacts and submit any changes required.

Members were called to submit any comments in relation to the web-page by Monday 22nd August. Subject to any comments ComReg intends to upload 'real' data by close of business on Monday 22nd August.

Action: Members to submit any comments in relation to the web-pages, review contact information and submit technical contact information before Monday 22nd August.

FWALA Licensing Process (Licensing Operations):

At the previous Forum meeting ComReg had informed the meeting about the transfer of the FWALA licensing function to ComReg's licensing operations team. To follow up, Margaret O'Sullivan from ComReg made a presentation putting the FWALA licensing process in the context of ComReg's generic volume licensing process. Details relating to the point-to-point licensing process were also presented in addition to information relating fee payment options.

ComReg indicated that, at some stage in the future, it intended to request licence fees at the time of application for licences. This proposal is with the view of streamlining the licensing process to ensure as quick as possible turn-around times of licence applications.

Domestic Frequency Coordination

Review of Draft Code of Practise:

No comments had been received since the last Forum meeting on the draft CoP presented at that meeting.

The meeting reviewed a second draft of the CoP based on some changes made by the Forum chair (version 1.1). Jim Connolly of ComReg had some additional comments which will be incorporated in another revision of the document.

Chairman's Note: It has come to the attention of ComReg that the Power Spectral Density figures presented in figure 2, section 3 of the draft CoP may not be sufficient to provide adequate protection to systems deployed in close proximity to each other. A document seeking views on revised Power Spectral Density figures is included in Annex 2.

Action: Members to review Annex 2 and submit comments on the revised power spectral density levels by 16 September

Presentation of possible regulatory solutions in relation to FWALA licensing

At the last meeting the Forum discussed possible solutions to maximise the potential of the FWALA licensing scheme particularly in the areas of licence coverage and spectrum assignment.

At this meeting ComReg made a presentation on possible regulatory solutions to address the scenarios discussed at previous meetings. In summary three possible solutions are:

1. An exemption from licensing for CPEs outside the licensed service area but within the 30km maximum threshold contour;
2. Maximum permitted threshold contour at <30km for licensed service areas of <15km;
3. Limited/Restricted licences;

In general the proposals were welcomed as positive steps by the meeting.

ComReg highlighted the possibility of ambiguity in cases of interference under the first proposal and the need for a strong consumer focused ground rules for this proposal. The meeting felt that while the proposal would present challenges in terms of network and interference management, it is a practical solution in terms of maximising the serviceable coverage and would also regularise any potential difficulty in enforcing compliance with a specific service area.

The second proposal was also welcomed. It was noted that systems may have difficulty providing service where the maximum permitted threshold contour is much less than 30km.

The meeting widely supported the third proposal.

The chair said that, assuming internal ComReg approval was obtained on the proposals, they would then be published for public consultation. The meeting agreed with the proposed approach.

Update re. CEPT – JPT BFWA

The chair presented an overview of the draft report being prepared by the CEPT Joint Project Team on Broadband Fixed Wireless Access. The JPT will present the report to the ECC working groups on Frequency Management (WGFM) and Spectrum Engineering (WGSE). The chair invited contributions from the FWALA Forum to the JPT BFWA. The chair will continue to bring updates from the JPT to the Forum meetings. The current draft of the JPT report shall be posted to the Forum document server for information.

Date for next Forum Meeting

The next meeting of the FWALA Forum will take place on **November 17th 2005** at a location and time to be confirmed.

Any other Business (AOB)

Digiweb queried the status of the 2.6GHz band at the European level. Jim Connolly briefed the meeting on the current consultation being conducted by the European Commission as to what action they should take, if any, regarding the future status of this band in the light of its designation as an expansion band for 3G services. The

chair offered to update the meeting on discussions regarding the 2.6GHz band within the European Commission at the next Forum meeting.

Brian O'Dwyer
Chairman
FWALA Forum
16 August 2005

Annex 1



FWALA Operator's Forum
3rd Meeting
10.00am, 11th August, 2005
At the Gresham Hotel, O'Connell St, Dublin

Agenda

1. Introduction
2. FWALA Forum Web-Page
3. FWALA Licensing Process (Licensing Operations)
4. Domestic Frequency Coordination
5. Update re. CEPT - JPT BFWA
6. Date for next Forum Meeting
7. AOB

Annex 2

Revision to Section 3 of current draft CoP – FWAFor(05)03_Ver1_1

At the 3rd meeting of the FWALA Operator's Forum ComReg presented version 1.1 of the draft Code of Practise (CoP) on Domestic Frequency Coordination, particularly relating to a block edge mask (ref: *FWAFor(05)03_Ver1_1*).

It has come to the attention of ComReg that the Power Spectral Density figures presented in figure 2 of section 3 of the draft CoP may not be sufficient to provide adequate protection to systems deployed in reasonably close proximity to each other.

Referring to ECC Report 033 (*FWAFor(05)Info3*) and draft ECC/REC/(04)05 (*FWAFor(05)Info4*) the power spectral density figures relating to the proposed block edge mask should be as shown in figure 1 below.

Comments on the values presented below in figure 1 are invited before 16 September 2005. After 16 September ComReg will issue a revised draft CoP document (version 1.2) encompassing the comments from the 3rd meeting of the FWALA Forum and the revised power spectral density figures.

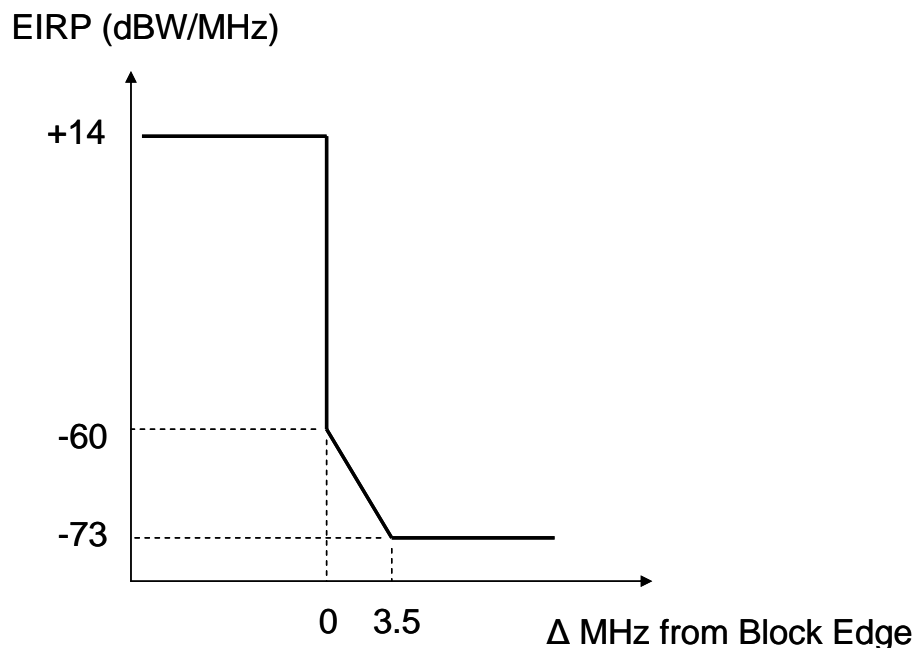


Figure 1 – Revised block edge mask power spectral density levels

Annex: 4 Meeting 4, July 19 2006



FWALA Operator's Forum
4th Meeting
10.00am, 19 July 2006

Agenda

1. Introduction

- a. Approval of Agenda
- b. Approval of Minutes/Review of Action Points

2. Quarterly Report Data Collection

- a. Short overview by Trend Manager Patricia Dowling of the Quarterly Report Data Collection and Analysis processes

3. FWALA Licensing Process (Licensing Operations)

- a. Update on latest round of FWALA applications
- b. FWALA Spectrum availability

- Coffee Break -

4. Domestic Frequency Coordination

- a. Review of Draft CoP – FWAFor(05)03 – No comments received, seek approval

5. Update re. CEPT - JPT BFWA

- a. Latest Developments from JPT BFWA Chairman.

6. Date for next Forum Meeting

- a. Proposal – 11th /12th October 2006

7. AOB

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Commission for
Communications Regulation

FWALA Licensing Process
FWALA Forum 19 July 2006

Status of Applications Received by May 4 Deadline

- 68 applications received in total
- 18 for 3.5 GHz band
- 50 for 10.5 GHz band
- Licensing process is ongoing
- Letters of notification expect to be sent before end July

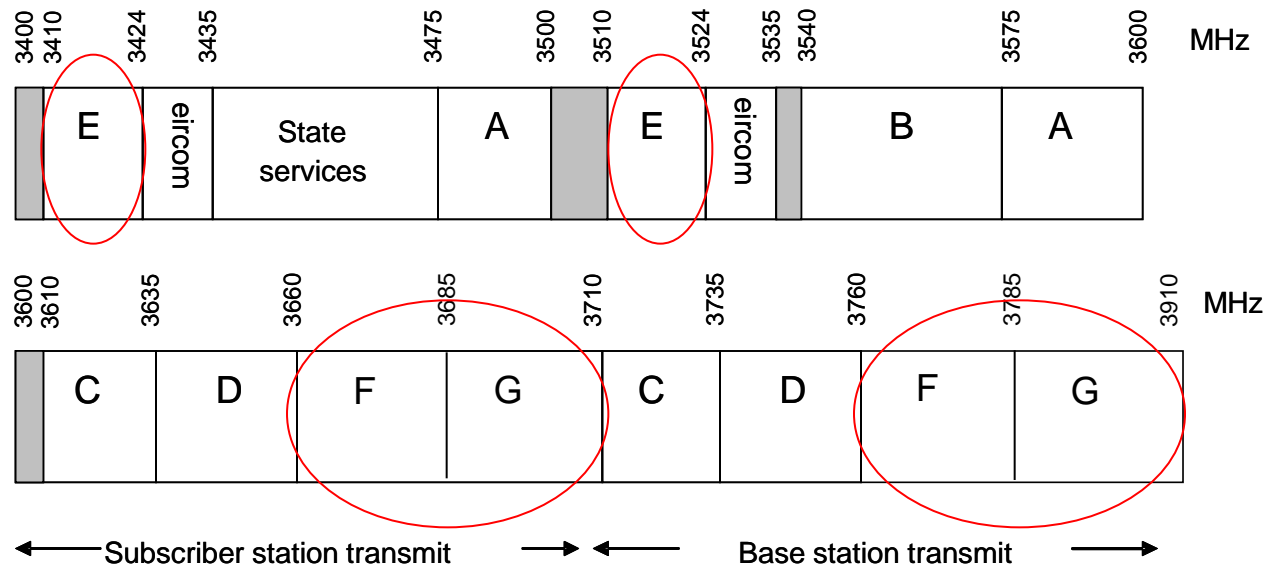
Channel E

- Very Limited Geographical Availability

Area	Sq. km	Radius km
Greater Dublin Area	178	7.5
Cork County Borough	25	2.8
Limerick County Borough	15	2.1
Waterford County Borough	12	1.9

FWALA Spectrum Availability

- ComReg hopes to make additional spectrum available for FWALA services later this year



26 GHz Band Rationalisation Update

- Spectrum will be auctioned in blocks of 2 x 28 MHz.
- The auction will be a single sealed bid process.
- A reserve price will apply.
- A block edge mask will be defined by ComReg.
- Expect the Information Memorandum and supporting documentation to be published in early August.

FWALA Licence Renewals

- Licensees must fulfil licence obligations.
- Signed declarations must be returned to ComReg 28 days prior to renewal date.
- Licence fee must be paid prior to renewal date.

www.comreg.ie



Commission for
Communications Regulation

ComReg's Market Data Warehouse

**Presentation at FWALA Forum, July 19th
2005**

Outline of presentation

- **ComReg's Market Data collection process**
- **Challenges of data collection**
- **Overview of ComReg's Market Data Warehouse**
- **Quarterly Key Data report process**
- **Statistical overview of FWA in Ireland**
- **Specific data required by ComReg in relation to FWA**
- **Future plans for data collection and publication**

Who collects data in ComReg?

- **Retail Division: Trend**

Trend is responsible for developing and maintaining an understanding of the status and potential development of the communications sector in Ireland. Trend is responsible for issuing Quarterly Key Data Reports and liaises regularly with international telecommunication bodies such as the ITU and the OECD.

- ComReg's current powers to collect data are set out in Article 5 of the EU's Framework Directive and secondary legislation.
- 2 main purposes for data collection:
 - **Market Updates**
 - **Market Analysis**

What data is collected by ComReg?

▪ **Market Updates- Trend**

- Quarterly primary data collected from telecoms operators by means of a questionnaire, supplemented by data from analysts such as tariff data
- Fixed (includes Internet and broadband), mobile, broadcasting, tariffs
- Published as Quarterly Key Data report
- Market surveys (residential, small/large business) are also commissioned by ComReg on a quarterly and/or bi-annual basis
- A public consultation on the Quarterly Report was held in early 2005, as a result of which the questionnaire and report were thoroughly revised.

▪ **Market Analysis**

- In-depth investigations of specific markets (defined at EU-level) by means of primary data collected from operators and supplementary secondary data (market research reports, surveys)
- Used to determine levels of dominance in each market and appropriate remedies to impose on dominant operators

Who uses ComReg's statistical data?

- **Industry/telecoms operators**
- **ComReg staff (for presentations and as supporting data for reports)**
- **Brokers/analysts**
- **Other government agencies, particularly for parliamentary questions to the Minister**
- **Politicians**
- **Other regulators**
- **Students**
- **Journalists**
- **International bodies such as the OECD, the IRG, the ITU, the European Commission and ECTA**
 - Supply quarterly broadband data to the EC, ECTA and the OECD
 - Supply general telecom stats annually to the OECD and the ITU

What are the challenges with data collection?

- **Cumbersome processes**

- Some of the smaller operators do not have streamlined procedures or structured databases for collection of data.
- This often leads to gaps in data as operators are unable to supply ComReg with data requested.

- **Confidentiality**

- Some data, particularly with regard to market share, is submitted by operators in commercial confidence and is not published except in aggregate form.

- **Accuracy**

- Data submitted by the operators contains occasional errors.
- Data is not always consistent from operator to operator. ComReg is working to rectify this by setting data definitions in the questionnaire sent to operators.

What are the Drivers for the new Data Warehouse?

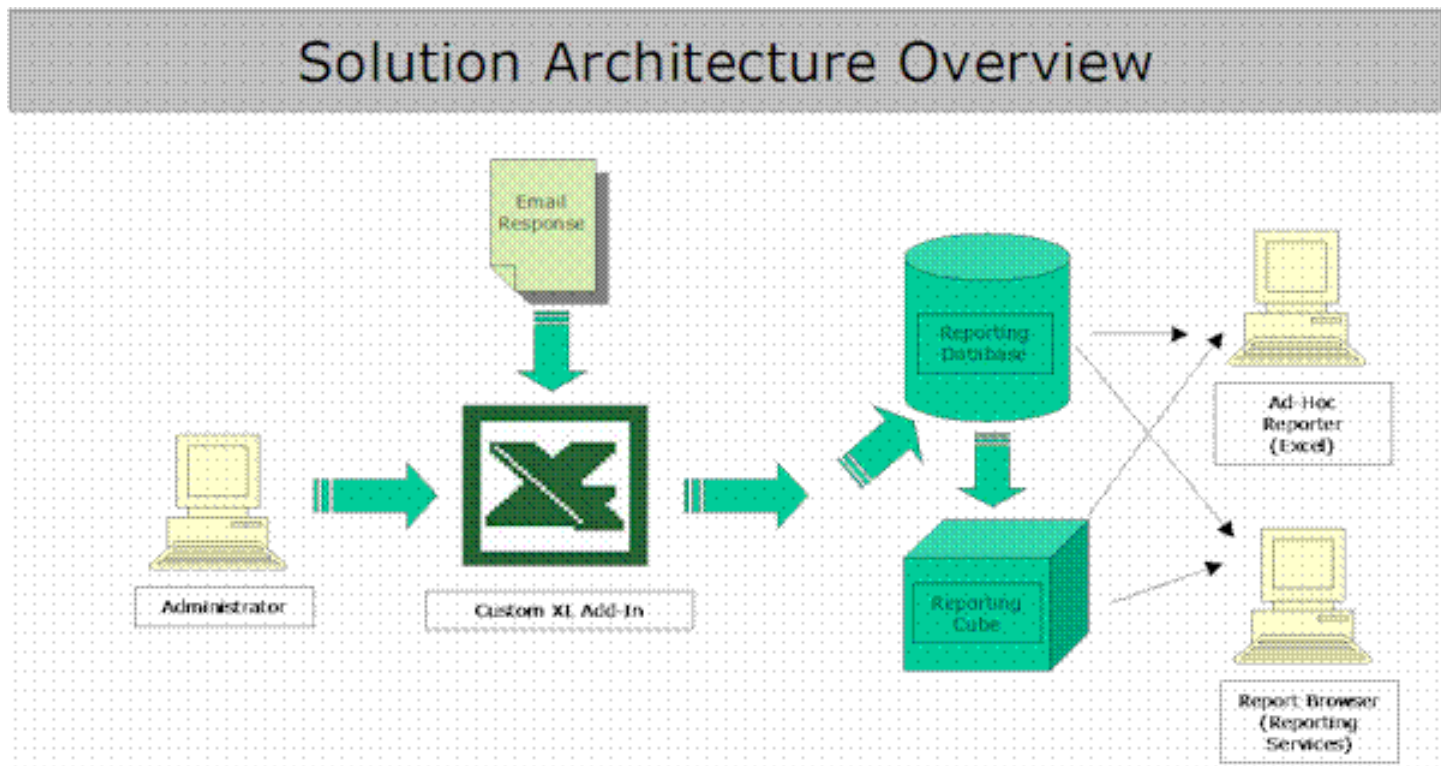
▪ **Best practice**

- ComReg works closely with the CSO, EC and the OECD to share statistical data. The CSO's SPARs project is currently compiling information on business statistics collected across the Public Sector with a view to formulating best practice guidelines and avoiding duplication of data collected. The market data warehouse allows ComReg to extract data more easily in response to data requests from the CSO etc.
- Many telecommunications companies have implemented similar data warehouses
- The Warehouse enables richer functionality such as online data submission

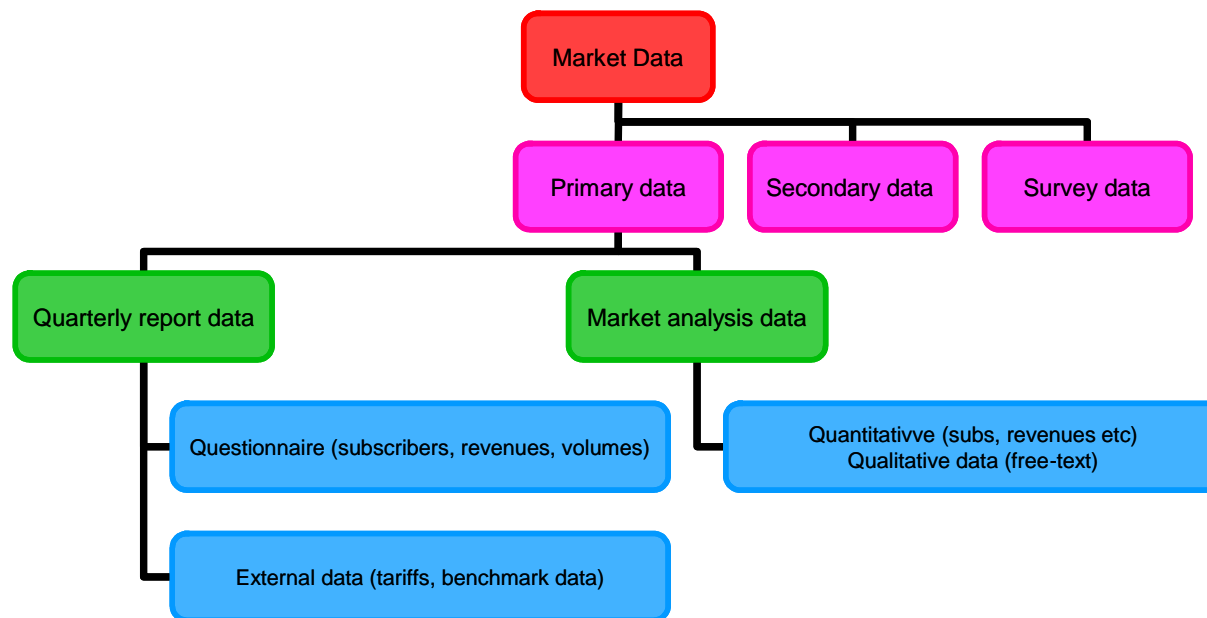
▪ **Richer analysis**

- Staff spend more time analysing the data using more powerful reporting tools

Model of the new Market Data Warehouse



ComReg's Data Model



Phase 1 of the Market Data Warehouse project was on primary data, i.e. data collected via the QR and market analysis questionnaires.

What does the Data collection Process involve?

- Questionnaires are emailed to each operator and can be returned by email, within a 6-week period.
- Quarterly report questionnaires are then loaded into ComReg's market data warehouse on SQL Server by means of an Excel add-in which audits and validates the data.
- Trend analysts also paper-check data submission against previous submissions and contact operators directly if there are any discrepancies.
- Once data has been submitted, trend produces analytical charts in Excel and writes up analytical text for the report. The aim is to publish the Key Data Report within 3 weeks of receiving all operators' data.

Latest data available

▪ Quarterly Market review

- Key data report for Q1 2006 (subscribers, traffic, revenues etc.):
<http://www.comreg.ie/fileupload/publications/ComReg0628.pdf>
- Accompanying explanatory memorandum
<http://www.comreg.ie/fileupload/publications/ComReg0628a.pdf>
- Q2 2006 key data is due back to Trend by 14th of August 2006
- Bi-annual SME telecoms survey (IMS Millward Brown) was published in January 2006, the next wave of research will be published in early August
- Q2 2006 Consumer survey (Amárach TrendWatch) survey is also due to be published in August 2006

Fixed Wireless Access Broadband

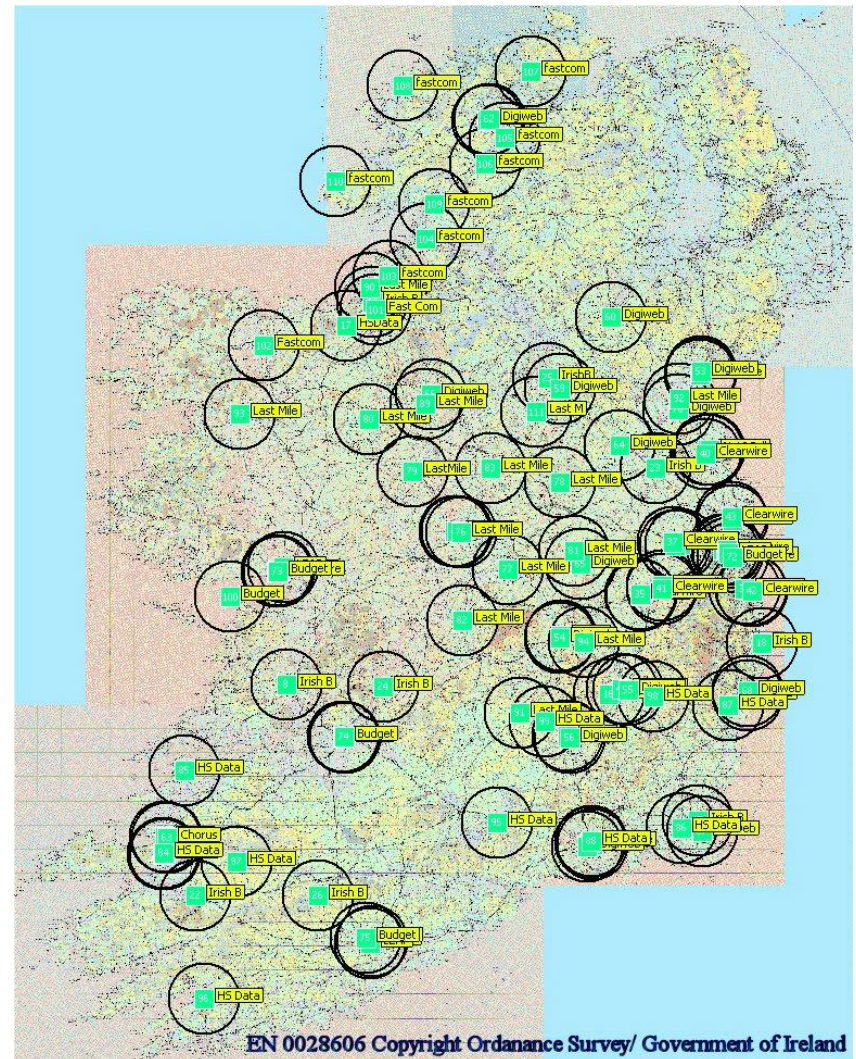
Fixed Wireless Access

- FWA is an alternative access platform for broadband access, particularly in rural areas
- Enabling alternatives to DSL and Cable
- Promoting innovation and competitiveness within the sector.

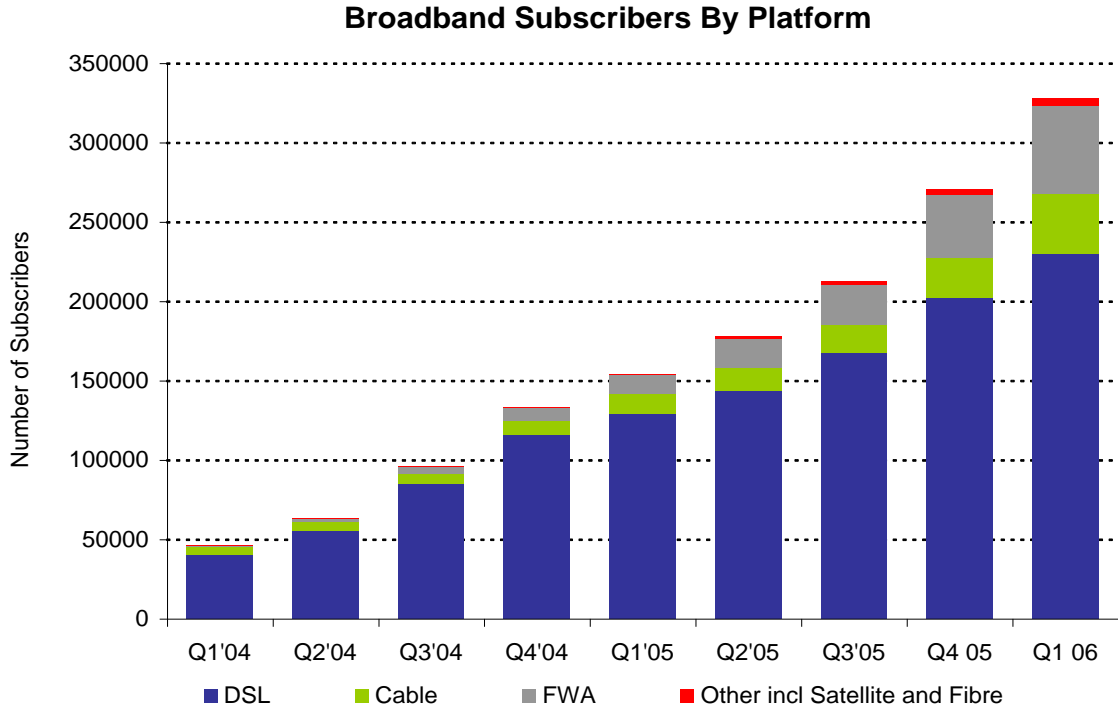
As of March '06

- 120 licences.
- 12 operators
- **47,000+ subscribers**

Fixed Wireless Broadband is the fastest growing broadband platform in the market



FWA is a key broadband platform in Ireland



Source: Quarterly Key Data Questionnaire

Platform	Q1 06 Subs	Quarterly Growth Q405-Q106	Year-on-Year Growth Q105-Q106
DSL	239,000	18%	84%
Cable	32,500	31%	173%
FWA	47,000	17%	275%
Other	3,500	3%	1856%
Total	322,000	19%	109%

What data does ComReg collect in relation to FWA?

C7 Fixed Wireless Access

Number of base stations

C68

Number of subscriptions on licensed FWA

	Non-Residential	Residential
C6	9	C70
C7	1	C72
C7	3	C74

Number of subscriptions on unlicensed FWA

Revenues from provision of FWA services ('000s euro)

Broadband services: Broadband access is defined as speeds of 144kbit/s or greater.

Licensed FWA – services offered in 3.5, 10.5 and 26GHz licensed bands

Unlicensed FWA- services offered in 5.8 and 2.4GHz unlicensed bands

Future Plans – Publication of Raw Data Online

- **Publication of some raw data elements is currently available via an Excel download on the ComReg web site**
 - <http://www.comreg.ie/fileupload/publications/ComReg0628b.xls>
- **The CSO provides open access to statistical software called PX-Web. The CSO uses this to publish its data in a form that can be manipulated by end-users (Database Direct service).**
- **ComReg is investigating potential use of this software for publication of raw data on our website.**
- **A screen grab from this service is reproduced in the next slide**

CSO's Database Direct web site (raw data)

Table: Population Estimates (Thousand) by Age Group, Sex and Year - Microsoft Internet Explorer

Address: rval.asp?ma=PEAA1&ti=Population+Estimates+(Thousand)+by+Age+Group,+Sex+and+Year&path=../Database/EireStat/Population%20Estimates/&lang=1

Central Statistics Office Ireland

Search Site Go [Advanced Search](#)

Home Statistics **Database Direct** Releases and Publications Census Surveys and Methodology Students Corner

Select Another Subject or Search - Choose Another Dataset

Table: Population Estimates (Thousand) by Age Group, Sex and Year
Information: [Information](#), [Footnotes](#)

Mark your selections and choose between table on screen and file format. [Marking tips](#)

Age Group <input checked="" type="checkbox"/> <input type="checkbox"/>	Sex <input checked="" type="checkbox"/> <input type="checkbox"/>	Year <input checked="" type="checkbox"/> <input type="checkbox"/>
Total:27. Selected: <input type="text" value="1"/>	Total:3. Selected: <input type="text" value="1"/>	Total:56. Selected: <input type="text" value="1"/>
15-24 15-19 20-24 25-44 25-29 30-34 35-39	All Persons Male Female	1999 2000 2001 2002 2003 2004 2005
Search <input type="text"/> <input type="button" value=">"/> <input type="checkbox"/> Text start	Search <input type="text"/> <input type="button" value=">"/> <input type="checkbox"/> Text start	Search <input type="text"/> <input type="button" value=">"/> <input type="checkbox"/> Text start

Presentation on screen is limited to 1000 rows and 90 columns.

Number of selected data rows Number of selected data columns

Select an option and press

Internet

Future Plans – Submission of Data Online

- **A flexible online data submission tool will also be integrated with the market data warehouse at a later stage. This will allow operators to submit data directly to the warehouse via a secure Extranet, and allow them to submit data amendments where necessary.**

The screenshot displays the Quask - FormArtist V3.5 software interface, titled "Questionnaire to Fixed Operators". The window includes a menu bar (File, Edit, Format, Insert, Deploy, Data, Register, Window, Help) and a toolbar with various icons. The main content area shows a questionnaire form with the following sections:

- Operator Details:**
 - Licensee:
 - Address:
 - Telephone:
 - Web Site:
 - Contact Person:
 - Email Address:
- Company Information:**
 - Number of Employees:
 - Capital Expenditure (exc Land & Buildings):
 - Services Offered:

The form is set against a light gray background with a dotted grid pattern. The bottom status bar shows navigation controls and page information: Page 2 of 3, 1352, and X: 404, Y: 146.

Thank you!

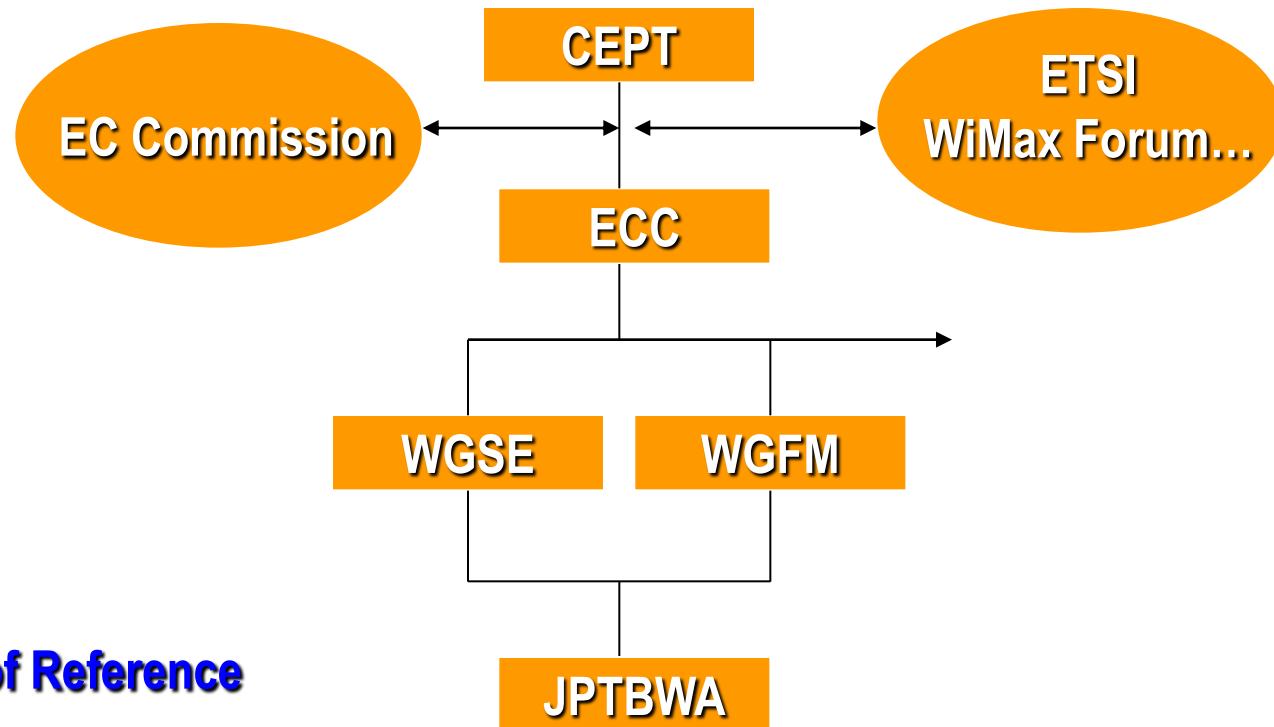
- **We are here to help....**
- **For further information on ComReg's data collection and analysis:**
 - Patricia Dowling, trend Manager, 01-8049722
patricia.dowling@comreg.ie
 - Suzanne Behan, trend analyst, 01-8049614
suzanne.behan@comreg.ie
 - Aisling McKenna, trend analyst, 01-8049728
aisling.mckenna@comreg.ie
 - Sonja Owens, trend/Divisional Assistant, 01-8049738
sonja.owens@comreg.ie



JPTBWA

The Story so far.....

ECC and the JPTBWA



Terms of Reference

1. **Advantages/Disadvantages of the need for a regulatory framework at 3.5GHz and 5.8GHz and develop these on approval and on completion of any necessary sharing studies**
2. **Prepare response to EC Mandate on Broadband Wireless**

3.5GHz Decision

- **Plan is to create Harmonisation Europe wide for Spectrum use at 3.5GHz (3400MHz – 3800MHz)**
- **Takes account of current uses in the band intra-service and inter-service studies**
- **Will allow for Fixed and Mobile use (and anything in between)**
- **Sharing studies to be completed in September**
- **Final Draft for WGSE and WGFM in September**
- **Final Approval expected WGSE/WGFM meetings January/February**

5.8GHz Recommendation

- **Plan is to create a framework for NRAs to use if they are opening the band for BWA**
- **No Harmonised use in Europe (yet!)**
- **Sharing studies completed in ECC Report 68**
- **Recommendation out to Public consultation in Europe**
- **Approval of document expected in September/October**

EC Mandate

- **EC asked CEPT/ECC to look at Broadband Wireless Access – EC Mandate**
- **Final Report to go to the EC in December**
- **Are there other bands that we should put up at this stage for further study/review?**

FWALA Operator's Forum
Minutes of 4th Meeting
19 July 2006 / 10.00am – 12.30pm
Venue: ComReg

Attendees:

Name	Organisation
Tara Kavanagh (Chairman)	ComReg
Tony Buckley	ComReg
Brian Whelan	ComReg
Kevin Kennedy	ComReg
Patricia Dowling	ComReg
Mark O'Raw	High Speed Data Solns
Colm Piercy	Digiweb
Charl Tatinger	Digiweb
Ruairi Jennings	Irish Broadband
Michael Steward	Irish Broadband
Brent Smith	Clearwire Ireland
Dan Churchill	Clearwire Ireland
Umberto Bini	Chorus
John Gibbons	Last Mile Wireless
Cyril Moriarity	Last Mile Wireless
Rory Ardagh	Magnet

1. Adoption of the Agenda:

The Forum adopted the agenda as shown in Annex 1.

2. Approval of minutes of 3rd meeting

No comments were received on the notes of the 3rd meeting of the forum. The notes from the 3rd meeting were approved.

3. Quarterly Report Data Collection:

The ComReg Trend Manager Patricia Dowling gave an overview of the data collection and analysis process carried out by ComReg to generate the quarterly report. She emphasised the importance of this information to ComReg and its stakeholders. She gave an overview of how the data collection process will be improved to enable easier input of data by operators and simply access for users.

4. FWALA Licensing Process (Licensing Operations):

The chairman gave a short overview of the ongoing FWALA comparative evaluation process. It is expected that all notification will be sent out by the end of July. She went on to outline ComReg's plans regarding making further spectrum available in the 3.5 GHz band later in the year. It was noted that ComReg failed to take any action on the issue of 'dead zones' since the last FWALA Operators Forum last year. ComReg stated that it would try to move this issue up the agenda internally and

investigate whether drafting a code of practice would be a better option than going out to consultation which would prolong the process of implementing a solution to this problem.

5. Domestic Frequency Coordination

Review of Draft Code of Practise:

No comments had been received since the last Forum meeting on the draft CoP presented at that meeting.

The meeting reviewed the third draft of the CoP based on the output of the previous FWALA Forum meeting. Clearwire queried the maximum EIRP level of 14dBW/MHz stated that they wish to consult with their engineers before agreeing to the document. The Chair agreed to find the origin of the EIRP level used and reference it in the document. Once agreement on the document is reached it will be put onto the ComReg webpage and FWALA operators will be asked to sign up to the code of practice.

Action: Clearwire to review EIRP level and revert to ComReg who will put the document on the ComReg web page inviting operators to sign the CoP.

6. Update re. CEPT – JPT BWA

The chair of CEPT – JPTBWA Tony Buckley presented an overview of the work ongoing in the JPT with respect to the 3.5 GHz and 5.8 GHz bands. The JPT is currently in the process of finalising a draft ECC Decision for the 3.5 GHz band which is due for approval in Jan/Feb 2007 and a draft ECC Recommendation for the 5.8 GHz band due for approval in Sept/Oct this year. He went on to give an overview of the EC Mandate and the work ongoing in responding to that. He encouraged the FWALA operators to get involved in the JPT and make their voice heard on an international level.

7. Any other Business (AOB)

Clearwire addressed the issue of 802.16e and put forward a proposal that the FWALA operators forum draft a recommendation requesting that ComReg amend the existing FWALA S.I 79 of 2003 to enable them to use the new standard. ComReg reiterated that the existing Regulations only allow for fixed services. There general consensus among the Forum that this is an issue, but the exact wording and timing of the proposal from the Forum to ComReg needed to be considered.

Action: Clearwire to draft a proposal which will be circulated to all FWALA Forum members by ComReg for comments before it is formally sent to ComReg.

8. Date for next Forum Meeting

The next meeting of the FWALA Forum will take place on **October 11th or 12th 2006** at a location and time to be confirmed.

**Tara Kavanagh
Chairman
FWALA Forum
20 July 2006**

Annex: 5 Meeting 5, November 29 2006



FWALA Operator's Forum
5th Meeting
Westbury Hotel
29 November 2006

Agenda

1. Introduction

- a. Approval of Agenda (FWAFor(06)03)
- b. Approval of Minutes/Review of Action Points

2. FWALA Flexibility

- a. ComReg presentation of the FWALA Flexibility consultation document 06/59

3. FWALA Mobility

- a. Presentation of Clearwire document 06(04) on mobility
- b. ComReg's preliminary position on FWALA mobility – FWAFor(06)05

- Coffee Break -

4. Frequency Coordination

- a. Review of Draft CoP – FWAFor(05)03
- b. Cross border co-ordination

5. Update on CEPT JPT BWA

- a. Update on the status of draft ECC Decision for the 3.5 GHz band

6. Date for next Forum Meeting

- a. Proposal – 14 March 2007

7. AOB

Date:

**Subject: Approach to ComReg from the 3.5 GHz
FWALA Operators Forum.**

1. The 3.5GHz FWALA Operators Forum met at 10.00am on 19th July 2006.
2. In light of Tony Buckley's presentation on CEPT - JPT BFWA, and the EC Document entitled: *'Mandate to CEPT to identify the conditions relating to the provision of harmonised radio frequency bands in the European Union for Broadband Wireless Access applications'* ¹ in particular, page 3, 'Order and Schedule', points 2. (5.) and (7.) whereas:

“2. In order to achieve the above, CEPT is mandated to:

(5.) adopt a flexible use approach to the determined bands, with any specific restrictions on the usage mode(s) (i.e. fixed, nomadic, mobile, or a combination of them) to be applied in specific bands being appropriately justified, and

(7.) give due consideration to technology neutrality and to expected licensing regimes associated to particular bands”,

a discussion ensued in AOB concerning technology-neutrality, mobility and technological progress.

3. Whereas also:

The 3.5GHz FWALA licenses in Ireland are issued pursuant to SI79 of 2003, in particular, (for the purposes of this discussion):

“Interpretation 2. (page 2)

“FWA” or “Fixed Wireless Access” means radio access for the provision of telecommunications services between a single base station at a fixed location and multiple subscriber terminal stations at fixed locations where the base station is connected to a telecommunications network;

“FWA apparatus” means apparatus for wireless telegraphy used for FWA consisting of a base station apparatus for wireless telegraphy at a specified fixed location and apparatus for wireless telegraphy at fixed locations to which subscriber terminal equipment at fixed locations is connected and which operates in the frequency bands designated by the Commission for

¹ http://europa.eu.int/information_society/policy/radio_spectrum/activities/rsc_work/mandates/index_en.htm

-
4. An approach to ComReg was initially proposed in two points as follows:
 - 4.1 In light of the CEPT Mandate, the Forum seeks a response from ComReg for a timeline when SI79 of 2003 might be amended to a more technology-neutral stance because emerging technologies and standards provide mobility (such as 802.16e) howsoever that might be achieved – i.e. within cell limits (break-before-make) or inevitably, where customers use new technology with inherent mobility - in spite of current regulation favoring cellular operators (GSM, 3G etc).
 - 4.2 That the Forum believes the distinction between Fixed and Mobile is now outdated, contrary to technology-neutrality and technological progress, and injurious to fostering operator-neutral competition in the market for the benefit of customers. The Forum therefore seeks the view of ComReg as to how innovative services, neutral competition and inward investment might be achieved if this distinction were to remain in place, and how any 'specific restrictions on the usage model (s) (i.e. fixed)..' can be 'appropriately justified', given the inevitable progress of mobility enshrined in new, inter-operable standards and the large-scale tooling for global manufacture currently under way.
 5. The Forum was unanimous that new standards and technologies contemplated, anticipated and provided mobility regardless of regulatory limitations.
 6. It was agreed that a confidential approach should be made to ComReg in the first instance in light of the CEPT Mandate and the developments under way with the CEPT JPT BFWA as presented by Tony Buckley.
 7. It was noted that, regardless of the operator, the FWA industry needs more spectrum and the regulatory will to create an environment that fosters investment in new technologies and standards generally seen as inevitable progress and not the exclusive domain of any one type of spectrum license holder or telecommunications operator.
 8. Accordingly, the Forum seeks ComReg's views on (4.1) and (4.2) above and a wider view on when the European harmonisation initiative might be transposed into Irish law, in particular, how clauses 2. (5) and (7) of the CEPT mandate are likely to be treated.

END

the purpose of FWA and in relation to a licence, means apparatus to which the licence relates;”

Source: ComReg

FWAFor06(05)

Date: 22 November 2006

**Subject: Mobility in the FWALA
spectrum bands**

Introduction

At the 4th FWALA Forum meeting on 19 July 2006 members of the forum agreed to put a proposal to ComReg seeking that the FWALA regulations S.I. 79 of 2003 be amended to allow operators to use mobile services if they wish to do so. Clearwire has input document FWA For(06)04 asking ComReg to review the existing FWALA regulations with a view to amending them to allow for mobility.

ComReg's preliminary position

ComReg is of the view that FWALA operators should be permitted to deploy mobile services as part of their product offering and is in the process of drafting a document for approval by the Commissioners to amend the FWALA regulations.

ComReg is proposing to insert the definition for Broadband Wireless Access as contained in the draft ECC Decision into the Regulations to replace the existing Fixed Wireless Access definition i.e. *“Broadband Wireless Access (BWA) is a descriptive term for the wireless delivery, mainly but not exclusively to an end user, of broadband traffic that can encompass fixed, nomadic and mobile applications. It is also considered that BWA systems might include backhauling services for the same or a second operator.”*

The amended regulations will apply to all FWALA frequency bands i.e. 3.5 GHz, 10.5 GHz and 26 GHz. It will be necessary to get the approval of the Minister for the amended regulations. It is expected that this process will be complete by early 2007.

In tandem with amending the FWALA regulations ComReg will be reviewing other regulations to see if they should also be similarly amended.

Introducing mobility into the FWALA spectrum bands may require the application of constraints/rules of operation to prevent interference between co-channel operators in adjacent service areas. ComReg invites input from FWALA Forum members on how we might address this issue.

Source: ComReg	FWAFor06 Info2
Date: 22 November 2006	
Subject: Draft ECC Decision on BWA in the 3400 – 3800 MHz band	

JPTBWA(06)128

ELECTRONIC COMMUNICATIONS COMMITTEE

ECC Decision
of [dd] [month] 2006
on availability of frequency bands between 3400-3800 MHz
for the Harmonised implementation of
Broadband Wireless Access systems
(BWA)

(ECC/DEC/(06)[xx])



EXPLANATORY MEMORANDUM

INTRODUCTION

This CEPT/ECC Decision addresses the availability of frequency bands between 3400-3800 MHz for the harmonised implementation of Broadband Wireless Access systems (BWA). These frequency bands are allocated to the fixed service on a primary basis and to the mobile service on a secondary basis in ITU Region 1.

Broadband Wireless Access ("BWA") is a descriptive term for the wireless delivery, mainly but not exclusively to an end user, of broadband traffic that can encompass fixed, nomadic and mobile applications. It is also considered that BWA systems might include backhauling services for the same or a second operator.

Results of CEPT/ECC studies clearly identify the band 3 400-3 600 MHz as the widest available choice for current and future BWA deployment in CEPT. The band 3 600-3 800 MHz has been identified as a possible additional or alternative frequency band. On the basis of a survey undertaken by ERO in 2005, updated in 2006, a clear majority of European countries indicated that they already use the 3.5 GHz band for FWA. In addition, it was also indicated in that survey the use of the 3.7 GHz band for Wireless Access purposes was at that time limited to a few European countries.

To prepare the harmonisation of the frequency bands 3 400-3 600 MHz and 3 600-3 800 MHz for BWA, the following sharing considerations have already been carried out:

- The intra-service sharing (i.e. coexistence rules for two ~~BWA Fixed Wireless~~ systems/cells of different operators) ~~was originally addressed in ECC Report 33 (February 2006) for FWA/NWA deployment conditions, as extended for the case of using indoor non-directional antennas at FWA terminal stations. The results of these studies can be found in revised version of ECC Report 33 (February 2006), which originally addressed only the case of user terminals with directional antennas. [Placeholder to cover coexistence between MWA MWA systems and coexistence between MWA and FWA (MWA: Mobile Wireless Access, FWA: Fixed Wireless Access)].~~ ~~The subsequent studies of mobile usage mode (MWA) were based on certain assumptions that included un-coordinated deployment as well as possible concentration of users (with active user density representative of BWA scenarios) in indoor environment. These studies indicated that a guard band of around one channel might be needed between MWA TS-TS, which is understood to be implicitly provided by CS Block Edge Mask requirements.~~
- The inter-service sharing of BWA vs. other systems and/or services in the 3.4–3.8 GHz band. The other systems and/or services considered in this study are ENG/OB (Electronic News Gathering and Outside Broadcasting), Fixed Point-to-Point links, Fixed-Satellite Service (Space-to-Earth) and Radiolocation Service (primary allocation below 3.4 GHz and secondary allocation above 3.4 GHz). The results of these studies are contained in ECC Report ~~100XX~~. This Report provides guidance for Administrations on co-ordination between BWA and other systems / services in the band, the details of the coordination depending upon the other systems/services characteristics and the BWA characteristics and usage mode. This includes guidance for co-channel sharing scenarios as well as for some adjacent compatibility cases, such as the impact from BWA operation in the 3.4-3.6 GHz band into FSS earth station receivers operating above 3.6 GHz.

BACKGROUND

In 1998 the band 3.4-3.6 GHz was identified as a preferred frequency band for Fixed Wireless Access (FWA) (ERC/REC13-04, ERC/REC14-03, ERC Report 25 refer). The band 3.6-3.8 GHz is also used in some CEPT countries for multipoint Fixed Wireless systems in accordance with provisions of ERC/REC 12-08. Consequently, many CEPT administrations have already delivered FWA licences to operators in order to provide Fixed Wireless applications. These authorisations are more often, technological neutral and provide flexibility and freedom for operators to choose the best use of the spectrum for Fixed applications. Any modification of the use of the spectrum, especially on the usage mode, shall be analysed in terms of compatibility and general policy for the licensed band.

During recent years the broadband connectivity has been increasing in Europe dramatically, boosted by the demand for high speed access to the Internet, large volume e-mailing, video and audio streaming and file sharing and further innovative multimedia services. The prospects of BWA take up have been changing recently after the consolidated

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Comment [TB1]: This note is a Placeholder for SE19 study text as analysis is to be carried out and appropriate text inserted

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industry efforts resulted in development of open inter-operability standards and new modulation technologies, allowing to overcome the line-of-sight requirements, hence allowing deployment of easy-to-install indoor user terminals. Recognising this ever increasing demand for broadband connectivity and the improved prospects of radiocommunication systems in satisfying these demands in a most universal way, the ECC has studied the advantages and disadvantages of the development of a regulatory framework for BWA in the frequency bands 3 400-3 800 MHz.

BWA systems are expected to be mainly deployed in all usage modes Fixed Wireless Access (FWA), Nomadic Wireless Access (NWA) and Mobile Wireless Access (MWA), where the Central Stations (CS) will be at a fixed location, while Terminal Stations (TS) will be deployed in a ubiquitous way. This Decision did not consider MultiPoint to MultiPoint (Mesh) architectures. Therefore further studies might be necessary in order to verify the applicability of this Decision for MP-MP (Mesh) systems subject to market availability of such systems.

It should be noted that terminal stations may use either directional or omni directional antenna. It is assumed that for Fixed and Nomadic use the vast majority of terminal stations using omni directional antennas will be operated indoor, this may not necessarily be the case for Mobile use.

The more traditional authorisation approach required the regulator to make decisions between the service definitions identified for each particular frequency band within an allocation table (e.g. ECA). This then required the regulator to define specific operating conditions. These conditions were required to manage the interference potential for the specific usage mode (e.g. Fixed and Mobile). Therefore, this may have meant that not all of the usage modes would be permitted. In some CEPT countries there has already been a move towards spectrum authorisations which allow operators flexibility in the manner in which networks are deployed and configured. These are spectrum block geographical area authorisations. This is where the operator is given authorisation for a defined area, rather than defining the operating conditions (e.g. transmitter specific location, specific bandwidth etc.). In this regime it could be possible, depending on the national situation, to give to the operators the flexibility to determine the usage mode. However it has to be acknowledged, that the need for managing the different interference potential related to the specific usage mode might result in limiting this additional flexibility, or in different constraints for the use of some modes.

REQUIREMENT FOR AN ECC DECISION

The allocation or designation of frequency bands for use by a service or system under specified conditions in CEPT administrations is laid down by law, regulation or administrative action. ECC Decisions are required to deal with the radio spectrum related matters and for the carriage and use of equipment throughout Europe. The harmonisation on an European basis supports the *Directive 1999/5/EC of the European Parliament and of the Council of 9 March 1999 on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity*. A commitment by CEPT administrations to implement an ECC Decision will provide a clear indication that the required frequency bands will be made available on time and on an European-wide basis.

**ECC Decision
of [dd] [month] 2006**

**on availability of frequency bands between 3400-3800 MHz
for the Harmonised implementation of
Broadband Wireless Access systems
(BWA)**

(ECC/DEC/(06)[xx])

"The European Conference of Postal and Telecommunications Administrations,

considering

- a. that the frequency bands 3 400-3 600 MHz and 3 600-3 800 MHz are allocated to the fixed service and to the fixed-satellite service (space-to-Earth) on a primary basis in ITU Region 1;
- b. that the bands in considering "a" are allocated to the mobile service on a secondary basis and the band 3 400-3 600 MHz is also allocated to the radiolocation service on a secondary basis in ITU Region 1;
- c. that definitions of BWA (Broadband Wireless Access) applications encompassing FWA (Fixed Wireless Access), NWA (Nomadic Wireless Access), MWA (Mobile Wireless Access) can be found in Recommendation ITU-R F.1399;
- d. that within the European Common Allocation Table (ECA) -the frequency band 3 400-3 800 MHz is also allocated on a primary basis to the mobile service ~~limited to SAP/SAB applications, EU17A refers;~~
- e. that the ECA indicates the major co-primary use of the band 3400 – 3600 MHz for BWA and coordinated SAP/SAB applications for occasional use;
- f. that the ECA indicates the major co-primary use of the band 3600 – 3800 MHz for BWA, medium/high capacity Fixed links and FSS applications;
~~g. that the ECA will be updated to include a primary allocation to mobile service for BWA in the bands 3 400 – 3 600 MHz and 3 600 – 3 800~~
- ~~h.g.~~ that the band 3400 – 3600 MHz is identified as a preferred frequency band for FWA (ERC/REC13-04, ERC/REC14-03 refer);
- ~~i.h.~~ that the band 3600 – 3800 MHz is also used in some CEPT countries for multipoint Fixed Wireless systems in accordance with provisions of ERC/REC 12-08;
- ~~j.i.~~ that in some countries the band 3400 MHz to 3410 MHz is used by land, airborne and naval military radars;
- ~~k.j.~~ that radio Amateur Services are authorised in the frequency band 3400 – 3410 MHz on a secondary basis;
- ~~l.k.~~ that spectrum authorisations for BWA in the bands in considering "a", based on assignment/allotment of spectrum blocks over a defined geographical area, may allow one or more of the applications of BWA referred to in considering "c";
- ~~m.l.~~ that for spectrum authorisations for BWA in the bands in considering "a" that are assigned, by Administrations, to individual equipment (i.e. Central Stations), the conditions of use may need to be qualified to manage the technical arrangements between a number of different operators;
- ~~n.m.~~ that for an efficient introduction of BWA in the frequency bands identified in considering "a", administrations will have to consider an appropriate co-ordination regime, e.g. licensing on a regional, local area or on an individual equipment basis, that takes in to account the extent of the use of these bands by other systems or services (e.g. FSS, Point-to-Point FS, etc);
- ~~o.n.~~ that in general, if suitable separation distance is set up between BWA central stations and other systems the impact of BWA terminal stations is not significant. Therefore registration for central stations alone may be sufficient for managing sharing issues;

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- p.o.** that within the two frequency bands defined in considering “a”, if completely available, paired sub-bands 3.4-3.5 GHz / 3.5-3.6 GHz and 3.6-3.7 GHz / 3.7-3.8 GHz provide suitable frame conditions for FDD and TDD systems or a combination; **Formatted: Bullets and Numbering**
- q.p.** that ECC Report 33 on "The analysis of the coexistence of point-to-multipoint Fixed Wireless Systems cells in the 3.4-3.8 GHz band" (February 2006) provides guidelines for efficient, technology independent deployment of 3.5 GHz and 3.7 GHz point-to-multipoint fixed wireless systems; **Formatted: Bullets and Numbering**
- s.g.** that ECC Report 76 on "Cross-border coordination of multipoint fixed wireless systems in frequency bands from 3.4-3.4 GHz" (February 2006) addresses the issue of finding a most suitable method and criteria for cross-border coordination between point-to-point systems and multipoint fixed wireless access systems located on different sides of a national border; **Formatted: Bullets and Numbering**
- t.r.** that ECC Recommendation (04)05 (adopted in February 2006) provides “Guidelines for accommodation and assignment of multipoint fixed wireless systems in frequency bands 3.4-3.6 GHz and 3.6-3.8 GHz”; **Formatted: Bullets and Numbering**
- u.s.** that CEPT/ECC Report ~~[100XX]~~ on ~~inter-service e~~Compatibility studies ~~in the band 3 400-3 800 MHz~~ contains guidance for Administrations on ~~co-ordination~~ between Broadband Wireless Access Systems (BWA) and other systems / services” addresses the inter-service sharing of BWA vs. in the frequency range 3 400-3 800 MHz, other existing services/systems (point-to-point, ENG/OB, fixed-satellite service (space-to-Earth) and radiolocation service); **Comment [BNetzA2]:** under public consultation until 15 December 2006
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- v.t.** that taking into account the availability of spectrum on a national basis, some CEPT administrations have already released spectrum within the 3.4-3.6 GHz band and may also consider providing spectrum within the 3.6-3.8 GHz band as far as compatible operation with earth stations in the fixed-satellite service (s-E) as well as with existing Point-to-point links in the fixed service is possible; **Formatted: Bullets and Numbering**
- ~~that the band 3.6-3.8 GHz may offer opportunities, that are currently unable to be realised in the band 3.4-3.6 GHz due to existing usage;~~
- x.u.** that it is important to make spectrum available in order to meet an overall demand for broadband connectivity; **Formatted: Bullets and Numbering**
- y.v.** that the identification of the bands defined in considering “a” for BWA does not preclude the future use of these bands by other systems and services to which these bands are allocated or designated; **Formatted: Bullets and Numbering**
- z.w.** that the frequency assignment/allotment for BWA should also take into account the existing bi- or multi-lateral international agreements and general cross-border co-ordination procedures to ensure suitable protection of similar or different systems and services in neighbouring countries; **Formatted: Bullets and Numbering**

DECIDES

1. that spectrum shall be designated for BWA deployment, within the band 3 400-3 600 MHz and/or 3 600-3 800 MHz, subject to market demand and with due consideration of other services deployed in these bands;
2. that in EU/EFTA countries the use of BWA equipment in frequency bands identified in Decides 1 shall comply with the R&TTE Directive. Conformity with the essential requirements in its Article 3(2) may be demonstrated by compliance with harmonised standard(s) (e.g. ETSI EN 302 326-2) or equivalent technical specifications;
3. that administrations shall consider allowing flexible usage modes within authorised BWA deployments in the frequency bands identified in Decides 1, ~~taking into account the following the process and considerations~~conditions as described in the Annex;
4. that for the deployment of BWA networks in the frequency bands identified in Decides 1, administrations shall take into account the situation regarding the use of the frequency band in the concerned area by other services/systems (e.g. FS, FSS, ENG/OB, etc) and that coordination of the BWA central stations with the other existing services/systems may be required;
5. that this Decision enters into force on [dd] [month] 2007;

6. that CEPT administrations shall communicate the national measures implementing this Decision to the ECC chairman and the Office when the Decision is nationally implemented."

Note:

- 1 *The following Members have a derogation to implement this Decision until [xx yy zzzz].*
- 2 *Please check the Office web site (<http://www.ero.dk>) for the up to date position on the implementation of this and other ECC Decisions.*

Annex

Considerations for Implementation of Flexible Usage Mode for BWA in 3400-3600 MHz and/or in 3600-3800 MHz

1. Definitions

The reference to “flexible usage mode” means regulatory provisions (e.g. licence conditions), which would allow BWA licence holder to deploy various types of Terminal Stations (TS): fixed (Fixed Wireless Access - FWA), nomadic (Nomadic Wireless Access - NWA) or mobile (Mobile Wireless Access - MWA).

The detailed definitions of FWA, NWA and MWA modes are given in ITU-R Recommendation ITU-R F.1399.

A typical example of FWA TS could be a stationary roof-top user equipment. An example of NWA TS could be a desk-top portable user equipment or laptop PC equipped with the internal BWA access card. An example of MWA TS could be a handheld user terminal.

2. General considerations

When deciding on granting flexible usage mode rights to BWA licence(s), administrations shall consider following issues:

- Compliance with relevant provisions of legal instruments governing the field of radiocommunications, such as the ITU Radio Regulations, EU legislation and corresponding national telecommunications laws (i.e. national acts transposing ITU and EU acts, as well as any further sovereign regulations in the field);
- Possibility of conflict with the Legacy situation, e.g. consider the regulatory limitations and conditions of existing (previously issued) authorisations in the frequency bands subject to this Decision with the terms of existing (previously issued) licences in the subject frequency band;
- Potential influence on distortion of competition, e.g. with regard to conditions of existing licences for provision of traditional public cellular services in other frequency bands, such as GSM and UMTS services;
- Potential conflict with technical provisions established by existing international frequency co-ordination agreements.

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3. Technical considerations

As a starting point, the guidance given in ECC Recommendation (04)05 on technical conditions for implementation of flexible usage mode, to shall be set in the technology neutral BWA licence(+) process, shall be considered, in accordance with the guidance given in ECC Recommendation (04)05.

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Furthermore, the introduction of MWA usage mode will be subject to following additional restrictions: Requirements for deployment of mobile (handheld) terminal stations (TS):

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- a. Maximum radiated power density of 25 dBm/MHz;
- b. Minimum ATPC range of 15 dB;
- c. etc., When blocks are assigned contiguously (without external guard bands) care should be taken not to allow a TS transmit centre frequency closer than one channel width from the block edge unless co-ordination between operators is undertaken. Co-ordination may include the application of other specific interference mitigation measures. However it is understood that such a “virtual guard channel” is implicit, under normal circumstances, through application of the CS BEM as recommended in ECC/REC(04)05.

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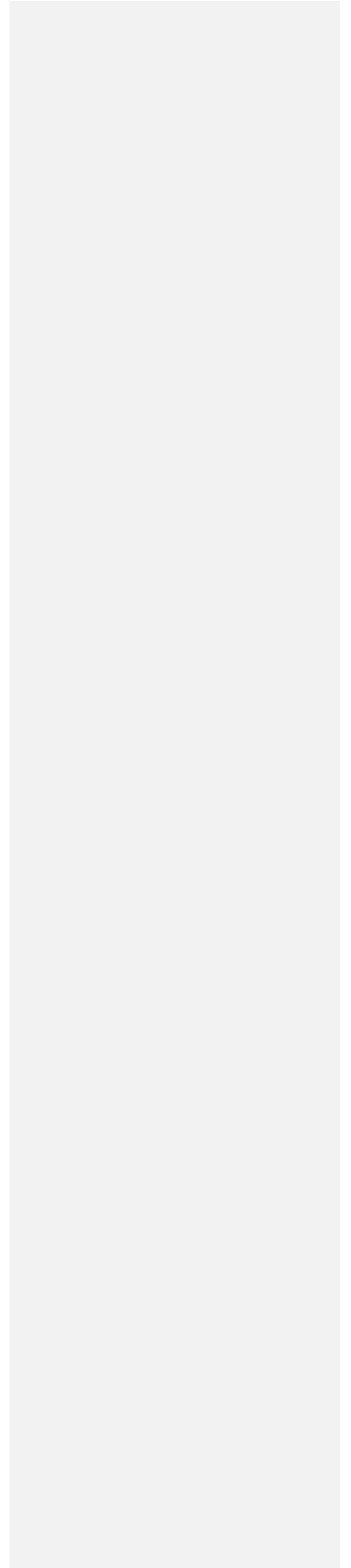
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[Any further requirements to be reflected in this section, including verification of applicability of ECC/REC(04)05 for MWA and guard band/band plan option could be added depending on the results of PT SE19 study of the TS TS coexistence].



Source: ComReg	FWAFor06Info 3
Date: 22 November 2006	
Subject: Draft final report in response to EC Mandate	

	<p>European Conference of Postal and Telecommunications Administrations – CEPT</p> <p>Electronic Communications Committee - ECC JPTBWA – Joint Project Team Broadband Fixed Wireless Access,</p> <p>ERO, 22-23 November 2006</p> <p style="text-align: right;">ECC/JPTBWA(06)TBC</p>
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Date: 21 November 2006

Subject: Text for the Final Report in response to the EC Mandate

Origin: UK

<p>Summary</p> <p>The attached document shows text to be considered for inclusion in the Final Report to the European Commission to address the Mandate issued to CEPT in January 2006.</p>
<p>Proposal</p> <p>As attached.</p> <p>For ease of reference, the German input document has been used and additions made to that document.</p>

[Draft] Final CEPT Report
in response to the EC Mandate
to identify the conditions relating to the provision of
harmonised radio frequency bands in the European Union
for Broadband Wireless Access applications

[March 2007]

Executive Summary

ECC has prepared the following responses to questions/tasks outlined in EC Mandate to CEPT on identification of conditions relating to the provision of harmonised radio frequency bands in the European Union for Broadband Wireless Access applications.

1. Establish the current degree of harmonisation of BWA bands in Europe and provide information on the global situation;

The detailed overview of the situation is provided in Section 3.2. Main findings are summarised below.

Frequency band 3400-3600 MHz

The band 3400-3600 MHz is identified as the widest available option for future sustainable BWA deployment in CEPT countries. Already now the existing national licensing arrangements have typical features that create favourable environment for the development of the BWA market: spectrum assigned in blocks of sufficient size; no registration of user terminals; very basic spectrum access requirements (channelling, duplex); very seldom restrictions on technology; restrictions on services in very few selected countries – create generally favourable environment for new advancing technologies.

When comparing updated responses in 2006 with the original information from the desk research carried out in 2005 by ERO, it becomes obvious that the trend is clearly towards more liberal conditions for BWA in this band (2 countries removed requirement for registration of TSs, 3 countries changed their position to positive on allowing Nomadic use in the band). Not a single country indicated toughening of requirements.

Frequency band 3600-3800 MHz

The band 3600-3800 MHz is identified as a natural and closest alternative/extension for BWA use after the band 3400-3600 MHz. Clear majority of European countries indicated that they either already use it for BWA or consider possibilities of such use in the future.

Besides the same general regulatory issues as in the band 3400-3600 MHz, in addition, the release of the band 3600-3800 MHz for BWA would seem largely conditional on ensuring sustainable co-existence of BWA with other services using this band, such as FSS Earth Stations and legacy PP FS links in this band.

Furthermore, the analysis of global situation shows that the bands 3400-3600/3600-3800 MHz would also provide for good prospects of globally harmonised BWA deployment.

Frequency band 5725-5875 MHz

The European situation with the 5725-5875 MHz band has not yet passed over the stage of initial considerations in vast majority of CEPT countries. Although certain interest for using this band by BFWA may be sensed clearly, administrations were delayed with their decision on opening this band for BFWA until the harmonised CEPT approach is developed and, in particular, until resolution of questions on sharing with other services in this band: notably FH (frequency hopping) radars, RTTT, FSS and FS.

Therefore it becomes clear that only now, after CEPT guidance for using this band for BFWA was established in the form of ECC/REC(06)04, some serious opportunities of wider usage of this band for BFWA might start developing.

On the global scale, this frequency band would also provide a good candidate for world-wide harmonisation.

2. Determine the frequency range(s) to focus upon initially for BWA applications, and justify this selection on the basis of clear criteria

Based on the analysis of current situation, the ECC has identified two frequency bands as the primary BWA deployment opportunities in Europe: 3400-3800 MHz and 5725-5875 MHz bands. Detailed considerations for these bands are described in section 3.3. Main outcome of these considerations is summarised by the following ECC actions.

A draft ECC Decision on “The availability of frequency bands between 3400-3800 MHz for the harmonised implementation of Broadband Wireless Access systems (BWA)” that establishes conditions for BWA use in the 3.4-3.8 GHz and, inter alia, clarifies the nomadic/mobile usage modes for BWA has been developed (see Annex 3) and now undergoes public consultation.

ECC Recommendation (06)04 on BFWA at 5.8 GHz (“Use of the band 5725-5875 MHz for Broadband Fixed Wireless Access (BFWA)”) has been adopted (see Annex 4), which establishes conditions for BFWA deployment in this band and, in particular, clarifies the provisions necessary for protection of other services/systems operated in this frequency band.

3. Study the possible use of additional frequency ranges in the future

see section 3.4 (Temp doc. 4 of 9th meeting)

4. Undertake required technical compatibility studies and consider the results of measurement campaigns between BWA applications and potentially affected radio services for the frequency ranges under consideration, based on expected interference scenarios

In the band 3.4-3.8GHz the most important issues that have been considered relevant in this band are:

- The intra-service sharing, i.e. coexistence rules for two BWA systems/cells of different operators. This work resulted in the development of the revised ECC Report 33, ECC/REC(04)05 as well as establishing the technical conditions for BWA reflected in the draft ECC Decision for the band. These technical conditions enable the fixed, nomadic and mobile usage of terminal stations.
- The inter-service sharing of BWA vs. other systems and/or services in the 3.4 – 3.8 GHz band. This study was finalised in September 2006 with the development of draft ECC Report 100 (“*Compatibility studies in the band 3 400-3 800 MHz between Broadband Wireless Access Systems (BWA) and other services*”), referenced from the draft ECC Decision. This Report provides guidance for Administrations on co-ordination between BWA and other systems / services in the band.

It should be noted that the two bands: 3400-3600 MHz vs 3600-3800 MHz will have different sharing considerations due to the different services, other than BWA, utilising these bands.

The technical compatibility study for introduction of BFWA (based on ETSI HiperMAN radio interface specifications) in the band 5.8GHz were carried out in SE PT38 and resulted in adoption of ECC Report 68. Compatibility studies between BFWA and Radiolocation Service, FSS and RTTT lead to the establishment of technical conditions for the introduction of BFWA in the 5.8GHz band. Due to the nature of the Fixed Service use of the 5.8 GHz band for point to point links, detailed compatibility studies have not been conducted. It is expected that if those countries which have existing fixed service point-point links were to introduce BFWA in the same frequency range, it would be necessary to co-ordinate between the systems. Compatibility with other considered systems/services in the 5.8 GHz band (SRDs, Amateur and Amateur Satellite (s-E)) was found to be feasible, not requiring additional regulatory provisions for BFWA operation. Some Administrations intend to carry out additional measurement campaigns to ensure that the proposed means for the coexistence between BFWA and Radar (DFS) is efficient. . At present, some countries (notably UK and Norway) do not allow usage in the 5795 – 5815 MHz in order to provide added protection for RTTT services.

5. Adopt a flexible use approach to the determined bands, with any specific restrictions on the usage mode(s) (i.e. fixed, nomadic, mobile, or a combination of them) to be applied in specific bands being appropriately justified

During the study it has become apparent that there is a need to consider flexible usage modes for BWA systems in the frequency band 3400-3800 MHz. In this context CEPT has looked at usage modes such as fixed, nomadic and mobile.

The introduction of flexible BWA use in the band 5725-5875 MHz was not considered by the group as the industry participants indicated that they believed that with present technology they did not consider full mobility to be practical given the generally poorer physical conditions for realisation of Non-Line-Of-Sight applications. It was also considered that introduction of services for full mobility would be difficult to achieve given the elaborate protection requirements that may be needed to give protection to the other (sensitive) services using this band. Previous studies carried out that are highlighted in ECC report 68 only considered sharing issues related to introducing BFWA deployments in these bands. The group concluded that if desired further technical analysis would need to be carried out to determine the feasibility of introducing more flexible usage modes in line with the WAPECS model into these bands.

The provisions for flexible BWA use in the band 3400-3800 MHz are reflected in the ECC/DEC(07)XX on introduction of BWA in that band.

6. Consider optimal channel plans for such bands, whilst avoiding undue discrimination towards any specific technology

The CEPT WGSE has for a long time studied the ways of providing the most optimal yet technology neutral technical conditions for utilising the band 3400-3800 MHz. The detailed information on the background and findings of those studies is given in Section 3.7.

This work resulted in adoption in 2006 of ECC Recommendation (04)05 (see Annex 4) that establishes provisions for a technology neutral frequency block assignment process.

[Further amendments to this section of the document may be necessary, pending resolution of SE19 studies, TDD/FDD considerations, and alike]

In developing ECC Recommendation (06)04 on BFWA at 5.8 GHz (“Use of the band 5725-5875 MHz for Broadband Fixed Wireless Access (BFWA)”) the minimum technical requirements to enable sharing with other services operating in the band have been developed.

For BFWA in the frequency band 5725-5875 MHz, taking into account the technical specifications established by EN 302 502 it was considered not necessary to develop a channel plan.

7. Give due consideration to technology neutrality and to expected licensing regimes associated to particular bands

Technology neutrality was an important factor when considering technical conditions for access to the frequency bands, see response to item 6 above. Furthermore, technology neutrality as a part of licensing process was considered as well. It was concluded that the flexible and technology neutral licensing could be realised by assigning to BWA licence holders frequency blocks of a certain size (ref. ECC/REC(04)05) without prescribing a specific technology. In the 5.8GHz band technology neutrality was achieved by recommending a combination of maximum EIRP levels and maximum EIRP spectral densities per MHz levels without any mandatory channel plans.

Given the different legacy situations in the two considered BWA bands as well as different deployment options, it was decided to recommend different licensing regimes in each of the bands:

- In the band 3400-3800 MHz traditional licensing scheme should be applied, based on assignment of contiguous technology-neutral frequency blocks by means of comparative analysis (“beauty contest”) or auction;
- In the band 5725-5875 MHz it is recommended that a simplified authorisation process should be applied, i.e. licence-exempt deployment or light-licensing (based on, either, a free for all (similar to licence-exempt) or a first-come-first-served principle).

8. Collect and present any readily available and relevant information on market demand for specific frequency bands, and on costs and benefits of alternative regulatory scenarios

The UK will have inputted an information document which highlights the results of some independent studies looking at various aspects of the costs and benefits that can be attributed to the introduction of BFWA in the 5.8GHz band. It may be worthwhile discussing the possibility of highlighting some information from this document in the report.

9. Propose a work plan for further future activities on BWA

Extension 3.4-4.2 GHz ?, bands below 3.4 GHz (System Reference Document under development within ETSI) ?, practical experience?, outcome of the WAPECS discussions, bands above 10 GHz (26 GHz, 40.5-43.5 GHz).

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4 Annexes:

Annex 1: Mandate to CEPT on BWA (European Commission, Radio Spectrum Committee)

Annex 2: ToR of JPT BWA

Annex 3: ECC Decision on BWA between 3400-3800 MHz (ECC/DEC/(xx)xx)

Annex 4: ECC Recommendation on BFWA between 5725-5875 MHz (ECC/REC/(06)04)

List of Abbreviations

Abbreviation	Explanation
ATPC	Automatic Transmit Power Control
BFWA	Broadband Fixed Wireless Access
BWA	Broadband Wireless Access
CEPT	European Conference of Postal and Telecommunications Administrations
DFS	Dynamic Frequency Selection
EC	European Commission
ECC	Electronic Communications Committee (of CEPT)
EN	European Standard
ETSI	European Telecommunications Standards Institute
FDD	Frequency Division Duplex
FH	Frequency Hopping
FS	Fixed Service
FSS	Fixed-satellite service
FWA	Fixed Wireless Access
HiperMAN	High Performance Radio Metropolitan Access Networks
ITU	International Telecommunication Union
JPT BWA	Joint Project Team on Broadband Wireless Access
PP	Point-to-point
RSCOM	Radio Spectrum Committee (European Commission)
RTTT	Road Transport and Traffic Telematics
SAP/SAB	Services Ancillary to Programming / Services Ancillary to Broadcasting
SRDs	Short Range Devices
TDD	Time Division Duplex
TS	Terminal Station
WAPECS	Wireless Access Policy for Electronic Communications Services
WiMAX	Worldwide Interoperability for Microwave Access (WiMAX Forum™)

1. Introduction

This report has been developed by the European Conference of Postal and Telecommunications Administrations (CEPT) in response to a European Commission (EC) Mandate (see Annex 1) given to CEPT by the Radio Spectrum Committee (RSCOM) to identify the conditions relating to the provision of harmonised radio frequency bands in the European Union for Broadband Wireless Access applications. In particular the EC requested that CEPT:

1. adequately schedule and prioritise activities under this Mandate to reflect activities already undertaken in this area and to conclude the work in a timely manner;
2. establish the current degree of harmonisation of BWA bands in Europe and provide information on the global situation;
3. determine the frequency range(s) to focus upon initially for BWA applications, and justify this selection on the basis of clear criteria;
4. study the possible use of additional frequency ranges in the future;
5. undertake required technical compatibility studies and consider the results of measurement campaigns between BWA applications and potentially affected radio services for the frequency ranges under consideration, based on expected interference scenarios;
6. adopt a flexible use approach to the determined bands, with any specific restrictions on the usage mode(s) (i.e. fixed, nomadic, mobile, or a combination of them) to be applied in specific bands being appropriately justified;
7. consider optimal channel plans for such bands, whilst avoiding undue discrimination towards any specific technology;
8. give due consideration to technology neutrality and to expected licensing regimes associated to particular bands;
9. collect and present any readily available and relevant information on market demand for specific frequency bands, and on costs and benefits of alternative regulatory scenarios;
10. propose a work plan for further future activities on BWA.

The order and schedule set out by RSCOM included a request for an Interim Report which was completed and sent from ECC in July 2006. The Interim Report gave an outline of the work completed to that date by CEPT on this topic.

The JPTBWA was established in 2005 following the March 2005 meeting of ECC (#10) and the JPT held its first meeting in May of 2005. Two main drivers led to the establishment of the JPT group;

1) Completion of the technical compatibility work undertaken in ECC project team SE38. That group was addressing the sharing of Fixed Wireless Access systems in the band 5725 – 5875 MHz with other services and produced a report (Report 68 “Compatibility studies In the Band 5725 – 5875MHz between Fixed Wireless Access (FWA) systems and other systems”), in June 2005. As the group were only mandated (by CEPT) to address the technical compatibility aspects, the next step would be to focus on the regulatory environment for FWA in the band.

2) CEPT was receiving enquires from both administrations and industry as to the regulatory situation across Europe for certain broadband wireless technologies. This was noted by input to the March 2005 ECC meeting from the subordinate group; Working Group Frequency Management (WG-FM). That document referenced technologies referred to as “WiMAX”.

Therefore ECC agreed that a Project Team be established to address both areas noted. A copy of the final Terms of Reference, for the Project Team, is attached at Annex 2.

2. Background

The Joint Project Team on Broadband Wireless Access (JPTBWA) was handed the task to study the advantages and disadvantages of the development of regulatory frameworks for *Broadband Wireless Access* in the band 3 400–3 800 MHz and *Broadband Fixed Wireless Access* in the band 5 725–5 875 MHz, taking account of already existing ECC deliverables (ECC Report 68, ECC Recommendation (04)05, ECC Report 33 and Draft ECC Report 100) and the needs of existing services. Originally the ECC requested that the deliverable for this study be an analysis of the possible actions, e.g. an ECC Decision or ECC Recommendation. Following this initial analysis by autumn 2005 it was decided that the creation of a Decision at 3.5GHz and a Recommendation at 5.8GHz would be the best way forward.

In that time the project team was also given the further task of answering a mandate from the European Commission attached as **Annex 1**. The EC requested an interim report by July 2006 and set out a number of issues to be addressed by the response. The following gives a summary of the current status of the work in the JPT and in particular the areas that the JPT is currently focusing on and the reasons for this focus. Further to this the JPT is also looking in detail at the particular issues as set out in the mandate. These are discussed in greater detail in the further sections of this report.

3. Response to EC Mandate

In order to respond to the mandate JPTBWA felt that it was necessary to take the order and schedule set out by RSCOM and address each heading as follows:

3.1 Schedule and prioritise activities

No need for "response" on this one.

3.2 Establish the current degree of harmonisation of BWA bands in Europe and provide information on the global situation

Doc. JPTBWA(06)108

3.3 Determine the frequency range(s) to focus upon initially for BWA applications, and justify this selection on the basis of clear criteria

Based on the analysis of current situation, the ECC has identified two frequency bands as the primary BWA deployment opportunities in Europe: 3400-3800 MHz and 5725-5875 MHz band. Detailed considerations for these bands are given further in this section.

3.3.1 The frequency range 3.4-3.8 GHz

It has been considered by JPT BWA, whether some additional measures may be taken into account by CEPT to further clarify the existing provisions with regard to the band 3 400-3 800 MHz, which were so far limited to fixed FWA type of point-to-multipoint applications. This may be done by upgrading the status of designation of this band for generic BWA by means of an ECC Decision. Such a new Decision would give higher visibility to the BWA designation and would provide more confidence for the administrations in making this band available.

It appears, that now ECC/REC(04)05 has been published, the regulatory provisions for the sub-band 3600-3800 MHz will become similar to that of 3400-3600 MHz apart from the "preferred" status. This however also means, that the two issues mentioned for the sub-band 3400-3600 MHz, namely the clear provision for nomadic/mobile use and the possible upgrade of BWA designation by means of an ECC Decision, have the same, if not higher visibility to this sub-band as well (e.g. the proposed ECC Decision might be helpful to initiate the wider use of this sub-band for BWA). Therefore any resolution of these two issues should be applied equally to both bands.

A draft ECC Decision (07)XX that establishes conditions for BWA use in the 3.4-3.8 GHz and, inter alia, clarifies the nomadic/mobile usage modes for BWA has been developed (see [Annex 3](#)) and now undergoes public consultation.

3.3.2 The frequency range 5 725-5 875 MHz (5.8 GHz)

The JPT has noted that there is clear demand from industry for this "lightly licensed/Licence Exempt" opportunity and evidence that the band has been successfully made available on this basis in some countries. However, some CEPT administrations expressed concerns on the possible sharing between BFWA systems and existing systems/services in the 5.8 GHz band.

Therefore the JPT agreed that a suitable regulatory framework should be developed as soon as possible to capitalise on the developments within the industry and to expedite the conclusions from ECC Report 68 into measures needed to ensure that equipment and deployments meet the requirements to facilitate equitable spectrum sharing in this band while safeguarding the use of this band for the other existing systems/services. Any future regulation should provide clear regulatory certainty for both suppliers, users of broadband applications and other spectrum sharing services, whilst at the same time providing flexibility and freedom to innovate as required by the demands for growing broadband applications.

It should be noted that in parallel during this period, ETSI has been developing a candidate harmonised standard (EN302 502) for this band that currently is between the Public Enquiry and National vote stage. There has been good cooperation and common participation between ETSI members and the JPT during this period.

The ECC Recommendation (06)04 was developed [and adopted in September 2006] (see Annex 4), which establishes conditions for BFWA deployment in this band and, in particular, clarifies the provisions necessary for protection of other services operated in this frequency band.

3.4 Study the possible use of additional frequency ranges in the future

The work of the ECC (JPTBWA) has been focused around the two bands directly referenced within the agreed ECC Terms of Reference for the group and the European Commission Mandate on Broadband Wireless Access (BWA). Currently ECC is addressing an additional Mandate around WAPECS systems (RSCOM06-09, Brussels, 2 March 2006) and these systems would encompass the scope of all BWA **platforms/usage modes/architectures**. Potential candidate bands within the WAPECS mandate are currently under consideration within CEPT.

The ECC work addressing the WAPECS Mandate has recently commenced. Noting the candidate bands and comments attached to the EC Mandate on Broadband Wireless Access, an additional band that **could/will/may be** considered for further study, and is not currently under the immediate consideration of ECC is 3.8-4.2 GHz, noting that the sharing situation may create more constraints than in 3.4-3.8GHz.

In addressing the band 3.4-3.8 GHz it became apparent that a number of CEPT Administrations had already licensed/authorised FWA systems prior to the specific work around the ECC Terms of Reference and the EC Mandate. This required those existing systems to be considered. Therefore it appears that the time is right to potentially address the band 3.8-4.2 GHz in a more pragmatic way and this would/could draw upon some of the expected outputs of the WAPECS work and the complementary results of the BWA work. In fact, much of the technical compatibility work that has been undertaken for the band 3.4-3.8 GHz will be directly relevant to the band 3.8-4.2 GHz. There maybe a need to assess bands above 6 GHz, although current technology developments limit the practical usage modes (i.e. full mobility is currently, from a technical perspective not feasible).

3.5 Undertake required technical compatibility studies and consider the results of measurement campaigns between BWA applications and potentially affected radio services for the frequency ranges under consideration, based on expected interference scenarios

3.5.1 The frequency band 3400-3800 MHz

The most important issues have been considered relevant to this band:

- The intra-service sharing, i.e. coexistence rules for two BWA systems/cells of different operators. This study for NWA and FWA cases had been originally developed in SE PT 19 in the form of revision of ECC Report 33, and the subsequent adoption of new ECC Recommendation (04)05, which provided guidance on deployment of FWA/NWA systems in the 3400-3800 MHz. Afterwards, the SE19 also studied the case of introducing MWA in this band and results of all these studies were reflected in the developed draft ECC Decision for BWA in 3.5 GHz.
- The inter-service sharing of BWA vs other systems and/or services in the 3.4 – 3.8 GHz band. The other systems and/or services considered in this study were SAP/SAB (also known as ENG/OB), Fixed Point-to-Point links, Fixed Satellite Service (Space-to-Earth) and Radiolocation Service (primary allocation below 3.4 GHz and secondary allocation above 3.4 GHz). This study was finalised in September 2006 with the development of draft ECC Report 100 (*“Compatibility studies in the band 3 400-3 800 MHz between Broadband Wireless Access Systems (BWA) and other services”*), referenced from the draft ECC Decision. This Report provides guidance for Administrations on co-ordination between BWA and other systems / services in the band, the details of the coordination depending upon the other systems/services characteristics and the BWA characteristics and usage mode.

It should be noted that the two bands: 3400-3600 MHz vs. 3600-3800 MHz will have different sharing considerations due to the different services, other than BWA, utilising these bands.

3.5.2 The frequency band 5725-5875 MHz

The technical compatibility study for introduction of BFWA (based on ETSI HiperMAN radio interface specifications) in this band were carried out in SE PT38 and resulted in adoption of ECC Report 68. This report identified the following most critical compatibility problems:

- Sharing with radiolocation service (static and Frequency Hopping modes), which led to establishment of DFS (Dynamic Frequency Selection) requirements for the BFWA systems in ECC/REC(06)04. This work required significant theoretical as well as experimental studies, the latter being carried both in the laboratory as well as real-life deployment scenarios;
- RTTT in the band 5795-5815 MHz – the ECC Report 68 concluded that interference could be possible in certain cases, therefore an additional annex was included to ECC/REC(06)04, describing the means for avoiding interference between RTTT and BFWA systems;
- FSS (Earth-to-Space) systems – the ECC Report 68 established certain e.i.r.p. limits for BFWA transmitters in elevation plane, which were incorporated as a separate annex in ECC/REC(06)04. Due to the nature of the Fixed Service use of the 5.8 GHz band for point to point links, detailed compatibility studies have not been conducted. It is expected that if those countries which have existing fixed service point-point links were to introduce BFWA in the same frequency range, it would be necessary to co-ordinate between the systems. Compatibility with other considered systems/services in the 5.8 GHz band (SRDs, Amateur and Amateur Satellite (s-E)) was found to be feasible, not requiring additional regulatory provisions for BFWA operation. It should also be noted that some countries (notably UK and Norway) who have regulations for BFWA usage in these bands have an additional requirement that does not allow operation of BFWA services within the RTTT bands between 5795 – 5815 MHz.

3.6 Adopt a flexible use approach to the determined bands, with any specific restrictions on the usage mode(s) (i.e. fixed, nomadic, mobile, or a combination of them) to be applied in specific bands being appropriately justified

[for 3.4-3.8 GHz: very flexible,
for 5.8 GHz: limited to BFWA]

3.7 Consider optimal channel plans for such bands, whilst avoiding undue discrimination towards any specific technology

3.7.1. Frequency band 3.4-3.8 GHz

The initial basic channel plans for this band were established long ago by ERC/REC 14-03 (3400-3600 MHz) and ERC/REC 12-08 (3600-3800 MHz).

Further, more elaborate technical guidance for deployment of FWA and NWA applications in this band was established in ECC/REC(04)05. The approach taken in this recommendation starts from very basic channel granularity of 0.25 MHz slots and allows accumulation of any number of such basic slots to form the actual blocks licensed to operators. Furthermore, the Recommendation (04)05 suggest some additional guidance regarding the overall size and proportioning of the blocks to allow the level playing fields for competing BWA operators. It is foreseen, that within the allocated blocks, the operators would be given flexibility to decide on the suitable internal channelling. Also provisions for flexible FDD/TDD deployment are established in the recommendation.

Therefore it is a view of ECC that the channelling arrangements and overall provisions for construction of licensed blocks, as established by ECC/Recommendation (04)05 are sufficient for all types of BWA deployment and therefore no further action is necessary.

[May need adjustment based on final stage of MWA studies in SE19]

3.7.2. Frequency band 5.8 GHz

Given the general preference for licence-exempt operation of BWA in the 5.8 GHz band and the vision for this band that provides an opportunity for novel BWA applications, it was felt that any guidance with regards to the channelling beyond the provisions of relevant ETSI standards (EN 302 502) would be unnecessary.

Therefore ECC did not identify any need for action in this regard. The ETSI EN302 502 identifies a 2.5MHz granularity for channel bandwidth.

3.8 Give due consideration to technology neutrality and to expected licensing regimes associated to particular bands

3.8.1. Technology neutrality as a part of frequency arrangements

The aforementioned ECC/REC(04)05 already actively pursued the implementation of technical neutrality by following means:

- It is recommended that operators are allowed to choose freely the internal channelling inside their allocated frequency blocks;
- It is recommended that licences do not specify whether FDD or TDD systems are deployed by the operator, as the technical provisions for construction of frequency blocks would allow in principle deploying both FDD and TDD systems;
- It is recommended to allocate blocks contiguously, while co-existence between operators of adjacent blocks in the same geographic areas should be ensured by inter-operator co-ordination and the technology neutral Block Edge Mask limits, established in the recommendation;
- Further provisions foreseen in Recommendation (04)05 to allow subsequent market-driven adjustments by operators (notably swapping of duplex parts of the blocks) to improve efficiency of using the spectrum.
- No specific air interface standard is identified.

It is therefore felt that such provisions for technical neutrality should be sufficient and highly beneficial for ensuring unhindered, highly competitive and most efficient use of allocated frequency band by BWA operators.

[May need adjustment based on final stage of MWA studies in SE19]

3.8.2 Licensed (co-ordinated) or licence-exempt (un-coordinated) deployment of BWA

Licensed deployment

Licensed deployment foresees exclusive assignment of individual frequencies or frequency blocks to be used for a particular purpose. As such, the assignment process often involves certain co-ordination with other domestic services using licensed or adjacent frequencies, as well as international frequency in certain cases.

The exclusive access rights coupled with co-ordination process ensures high degree of “interference free” operation, hence allowing operator/licence holder to provide telecommunications service of guaranteed quality/availability.

Licence-exempt deployment

Licence-exempt deployment is based on a general authorisation (known as general licence, “blanket” licence, etc) to deploy certain type (specified in that general authorisation) of radiocommunications equipment without individual authorisation, hence without co-ordination with other users that might utilise the same frequency channel/band.

Since such use of a particular frequency channel does not involve exclusivity nor co-ordination, the user may not be guaranteed any level of protection beyond what is provided by type of authorised devices (e.g. if low power is prescribed, then interference is not like to propagate at longer distances) or some autonomous interference avoidance techniques (e.g. DFS, etc).

Light Licensing

The light licensing regime provides a compromise between full-scale licensing and licence-exempt deployment, by establishing licensing scheme on the basis of simplified licensing procedures, usually carried by the licensee using some automated means provided by administration (e.g. self-registration in the on-line database, etc).

Depending on the sharing situation in the band, the administration may built various co-ordination mechanisms in the light-licensing scheme, e.g. the online-database could perform automatic co-ordination with previously registered stations, check positioning of proposed station with respect to certain exclusion zones, etc. Alternatively, operators may be required to do their own evaluation of compatibility of the new station with other stations previously recorded in the registration database.

The JPTBWA has ensured that the outputs, in the form of CEPT regulatory documents, are technology neutral within the scope of BWA. Sharing considerations for other services has, to a degree, limited full flexibility (in particular the 5.8 GHz). As was noted within the interim report submitted, a number of licensing licence regimes are likely to be facilitated in the bands within the terms of reference of the JPTBWA.

Licensing (including light); licensing normally comes in two distinct regimes, device licensing (reflected as mixed bathing in the interim report) and spectrum space licensing. Device licensing normally requires detail of the parameters of the equipment to be deployed for the management of interference between users and therefore this may limit the flexibility operators may have. Spectrum space licensing, where a block of spectrum is allocated to an operator, means that the operator will undertake his own assignments and therefore he will be best placed to decide which technology and which service he should deploy. As was reflected within the Interim Report to the Commission, where an operator has the flexibility to deploy over an area the terms fixed, mobile and nomadic become, to an extent irrelevant as he is managing the sharing environment, rather than the regulator. This removes the regulator from specifying technology and service requirements “up front” as a licence condition. Of the bands considered by the JPTBWA, the bands 3.4 – 3.8 GHz appeared to be the most suited to a licensing regime, with 5.8 GHz appearing to be suited to either a licence exempt or licensing (potentially light) licensing regime.

Given the different legacy situations in the two considered BWA bands as well as different deployment options, it was decided to recommend different licensing regimes in each of the bands:

- In band 3400-3800 MHz apply traditional licensing scheme, based on assignment of contiguous technology-neutral frequency blocks by means of comparative analysis (“beauty contest”) or auction;
- In band 5725-5875 MHz apply simplified authorisation process, i.e. licence-exempt deployment or light-licensing (based on non-protected /non-interference basis or first-come-first-served principle).

3.9 Collect and present any readily available and relevant information on market demand for specific frequency bands, and on costs and benefits of alternative regulatory scenarios

The content of this section is summarised and revised from the TR 102 453-1 ETSI System Reference Document on Converged Fixed-Nomadic Broadband Wireless Access (BWA) systems frequencies above 3.4GHz

3.9.1 Market information

The BWA market up until recently was a niche market due to a number of possible causes:

- Lack of open standards, which kept the component costs at a high level;
- Problematic business case, due to high cost of installing outdoor antennas;
- Lack of light-licensed spectrum, with a power allowance suitable for large cell deployments for municipal applications;

- Low cost wired infrastructure (DSL, CATV) available in many areas;
- No added value to compete with wired infrastructure (e.g. mobility, higher data rates).

However, this may change with the development of open standards for BWA (including technologies enabling indoor applications) and the introduction of flexibility into the licensing regime which may bring vitality to the BWA market. The following target customer groups requiring spectrum can be identified:

- Small businesses and enterprises, which seek a competitive offering for broadband service with a guaranteed, service level agreement. In this scenario an outdoor, fixed subscriber terminal with a directional antenna is employed to provide the highest throughput connectivity. This bandwidth is then dispersed to many users within the business.
- Residential users in areas where DSL or cable broadband services ARE NOT available. In this scenario, a service similar to consumer DSL connectivity is offered, generally at a premium to current DSL broadband service rates. This premium is required to offset the cost of the “truck roll” required to professionally install the fixed outdoor subscriber station.
- Residential service in areas where DSL or cable broadband services ARE available. This is generally complementing or enhancing the wired broadband offering. The wireless approach can provide the same service if enough licensed spectrum will be available. In this case nomadic and mobile usage modes would create added value in comparison with DSL operation.
- In the future, possibly evolving to a Triple-play service, i.e. for multimedia, fast internet and VoIP

Using radio technologies can add nomadic and/or mobile operation to the scenarios mentioned above. Without the ability to deploy indoor modems (which are nomadic by ITU definition), wireless providers cannot offer a broadband service competitive with those offered by wireline providers, and therefore will be limited to offering BWA only where wireline services are not available. Indoor or “self-install” modems are essential for offering broadband services at competitive costs.

3.9.2. Market size, forecasts and timing

The European market size for BWA is dependent on:

- Penetration of existing wired services (most notably, DSL);
- BWA service offering.

The experience shows that if there is an existing wired service, it will usually be more cost effective than the equivalent wireless service. However, for customers beyond the wired service reach, where new infrastructure has to be deployed, the wireless service may be preferable. In order to create competition, adding nomadic and mobile operation, will enhance the attractiveness of wireless services.

There is a huge market potential for truly broadband services as long as there is enough readily accessible spectrum to provide the requested services. In 2006 WiMAX certified equipment has become available on the market.

3.9.3. Spectrum requirement and justifications

There are two general cases addressed in detail in the TR 102 453-1 ETSI System Reference Document on Converged Fixed-Nomadic Broadband Wireless Access (BWA) systems frequencies above 3.4GHz:

- Basic spectrum needed per operator, to provide the target services;
- Spectrum needed per operator, to provide both the target services and also to provide in-band feeding (backhaul) to feed the microcells covering gaps in the coverage.

Generally there is a quantifiable requirement for 56 MHz (Total 56 MHz for TDD or 2x28 MHz for FDD) per operator for DSL-like services. This spectrum has been calculated in TDD mode, assuming up-link OFDMA and asymmetrical up-link/down-link traffic. If there is a requirement for in-band feeding, the required spectrum is increased by 25%, which would result in a requirement of 70 MHz.

Furthermore, for Triple Play service offerings, the TR 102 453-1 ETSI System Reference Document on Converged Fixed-Nomadic Broadband Wireless Access (BWA) systems frequencies above 3.4GHz: recommends an additional 70 MHz to 85 MHz of net spectrum per operator.

However it should be noted that the above figures should be weighted against the necessity, in order to ensure competition serving final users interest, of accommodating more than one operator in the available spectrum.

JPTBWA discussion

The market demand for frequency bands will be driven by a number of key factors, although these appear to fall into two distinct areas;

- 1) Technology developments: clearly the development of technologies will drive interest into particular frequencies bands (i.e. due to the bands the devices are designed to operate in).
- 2) Interest in frequency bands by potential operators: operators' demand for frequencies will be driven by technologies and their plans to deploy services. However, the commercial success of these plans will depend ultimately on consumer acceptance and take-up of the services on offer, which cannot be predicted with certainty. It is therefore important to adopt a flexible approach. If spectrum is reserved exclusively for wireless broadband applications that consumers do not find attractive, there will be a potentially substantial opportunity cost. In other words, alternative innovative applications that might have delivered sizable benefits to consumers will have been denied access to spectrum as a consequence and those benefits will have been lost or deferred.

3.10 Propose a work plan for further future activities on BWA

SRDoc points

1. Demand to consider 3.8-4.2GHz – problems that are faced
2. below 3Ghz
3. further studies on sharing with RTTT, possibility of the introduction of mobility and the use of higher gain antennas in 5.8GHz?

Practical experience that more spectrum may possibly be needed in the future.....

Wireless Lans used for BWA??....

What can/could be done with Bands above 10GHz

WAPECS discussion

4. Summary and Conclusions

We need to conclude on work done and maybe outline that this is the end of JPTBWA involvement....
We need to propose possible further work to do (being done) and who will do it....



Memorandum of Understanding on Signals across International Borders

Samuel Ritchie
FWALA Forum
29 November 06

Topics

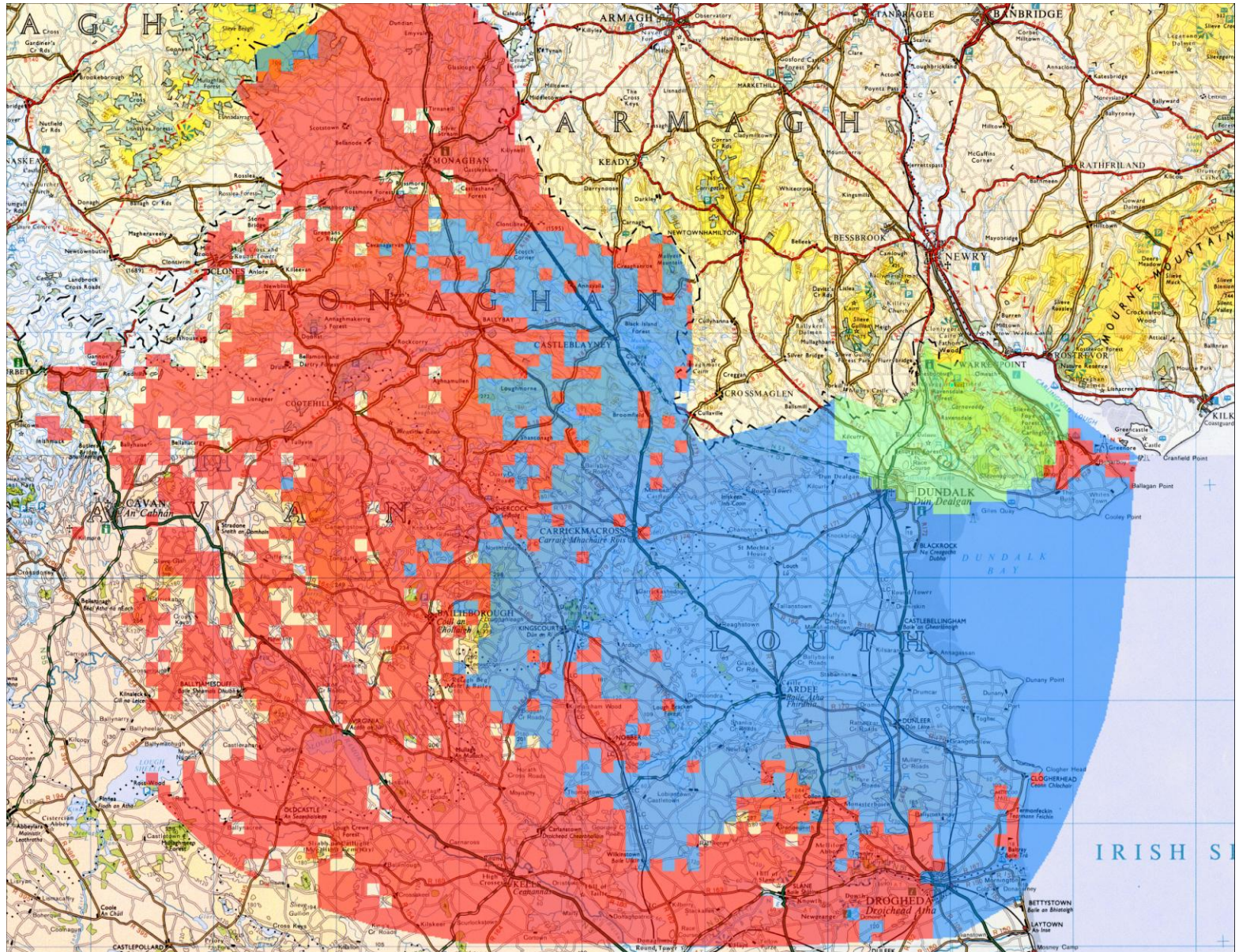
- Balancing Spectrum Efficiency and International law.
- The Ideal World
- The Real World
- Possible Technical solutions
- Proposed BWA MoU
- What is a usable Power Spectral Density?

The Balancing Act.



- **Sovereign right of Countries.**
- **Equitable access to spectrum**
- **Protection from Harmful Interference**
- **Facilitate the efficient and effective operation of radio systems.**
- **Entered into agreements:**
 - Aeronautical
 - Maritime
 - Broadcasting
 - GSM and 3G agreements

The Ideal World

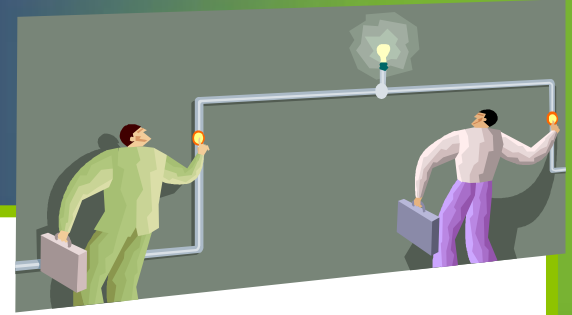


Possible Solutions



- **A combination of reduction in height or power and/or use of directional antenna,**
- **Not always possible to achieve the ideal**
- **Agree with affected Countries on amount of signal that can cross border.**
- **Establishment of agreement in form of MoU – Memorandum of Understanding.**
- **Possibility of agreement outside the MoU – a long and tedious process.**

Memorandum of Understanding



- Content:
 - **Agree an acceptable level of energy crossing the border - compromise.**
- Power Spectral Density (PSD) = $-120 \text{ dBW} - \text{BW of } 1 \text{ MHz}$
 - **Agree on where to calculate this PSD.**
 - **Agree on what height to calculate this PSD**
- Other
 - **Agree what propagation model will be used.**
 - **Agree on what information will be exchanged.**

Input from the FWALA Forum

What minimum PSD do you need to provide an acceptable signal to customers?



Dear Tara

Having a lovely time on holiday, please ensure we can have -118 dBW at the border.

Regards

The FWALA Forum



Transmitting across International Borders

Memorandum of Understanding

Samuel Ritchie

FWALA Forum

29 November 06

Source: ComReg

FWAFor06(06)

Date: 5 December 2006

**Subject: Minutes of 5th meeting of
FWALA Forum**

**FWALA Operator's Forum
Minutes of 5th Meeting
29 November 2006 / 10.00am – 12.30pm
Venue: Westbury Hotel**

Attendees:

Name	Organisation
Tara Kavanagh (Chairman)	ComReg
Samuel Ritchie	ComReg
Brian Whelan	ComReg
Kevin Kennedy	ComReg
Joey O Sullivan	ComReg
Mark O'Raw	High Speed Data Solns
Peter Hendrick	Airspeed
Paul Cunane	Westnet
Ruairi Jennings	Irish Broadband
Michael Steward	Irish Broadband
Brent Smith	Clearwire Ireland
Dan Churchill	Clearwire Ireland
Brefne Sweeney	Clearwire Ireland
John Gibbons	Last Mile Wireless
Cyril Moriarty	Last Mile Wireless

1. Adoption of the Agenda:

The Forum adopted the agenda as shown in Annex 1.

1.1 Approval of minutes of 4th meeting

No comments were received on the minutes of the 4th meeting of the forum. The minutes from the 4th meeting were approved.

2. FWALA Flexibility Consultation

ComReg gave a brief overview of the FWALA Flexibility consultation document 06/59 which is currently out for consultation. All operators were encouraged to respond to the document as it is only through input from the FWALA operators themselves that ComReg can make informed decisions on how to proceed with this issue.

3. FWALA Mobility

Clearwire document FWAF06(04) asked ComReg to consider amending the existing FWALA Regulations in S.I. 79 of 2003 to permit the use of mobility in their service area. ComReg document FWAF(06)05 outlined ComReg's preliminary position on this issue. It stated that ComReg was in the process of seeking the permission of the Commissioners to proceed with amending the regulations and obtaining the consent of the Minister for the amendment. ComReg expects that this task should be complete by spring 2007.

4. Frequency Coordination

4.1 Review of Draft Code of Practise:

Clearwire presented a graph showing the difference between the ETSI block edge mask and the one proposed by ComReg in document FWAF(05)03. Clearwire is of the view that the block edge mask as proposed by ComReg is too restrictive and that one based on the ETSI standard would be more suitable. ComReg agreed to review the proposed block edge mask following further study of documentation to be forwarded by Clearwire.

Clearwire questioned the origin of the interference threshold contour level of 33dBuV/m for 3.5 GHz licensees. ComReg stated that this figure was derived using a worst case scenario and that as part of the FWALA flexibility consultation ComReg was seeking views on whether this figure needs to be revised.

Action: Clearwire to input a document proposing a revised block edge mask.

4.2 International frequency co-ordination:

Samuel Ritchie of ComReg gave an overview of the international frequency co-ordination process that ComReg engages in with Ofcom, ComReg's UK counterpart. ComReg is in the process of drafting a Memorandum of Understanding (MoU) with Ofcom which will define a Power Spectrum Density (PSD) that operators in Ireland can put across the border into Northern Ireland. Forum members were asked to provide ComReg with information regarding what is the minimum PSD is required to provide service to their customers at the boarder with Northern Ireland.

Action: Forum members to provide ComReg with the minimum Power Spectrum Density they require to enable them to provide services to their customers at the border.

5. Update re. CEPT – JPT BWA

The chairman gave an update on the status of draft ECC Decision for the 3.5 GHz band which will go out for public consultation following the ECC meeting at the end of November. The Chairman went on to say that the CEPT response to the EC Mandate has been delayed and will not be approved by CEPT before March 2007.

All Forum members were encouraged to submit their comments on the draft ECC Decision when it is published for public consultation.

Annex: 6 Meeting 6, June 19 2007



FWALA Operator's Forum
6th Meeting
ComReg Offices
10.00am, June 2007

Agenda

1. Introduction

- a. Approval of Agenda (FWAFor(07)01)
- b. Approval of Minutes/Review of Action Points

2. Geographical Service Areas Consultation

3. FWALA Mobility

- a. Presentation of Clearwire document 06(04) on mobility
- b. ComReg's preliminary position on FWALA mobility – FWAFor(06)05

- Coffee Break -

4. Frequency Coordination

- a. Review of Draft CoP – FWAFor(05)03
- b. Cross border co-ordination

5. Date for next Forum Meeting

- a. Proposal – 14 March 2007

6. AOB



FWALA Operator's Forum

Forum Terms of Reference

The objectives of the Forum are to facilitate open discussion within the industry, agree procedures/practices among operators where necessary and promote FWA as a viable and reliable alternative platform for the provision of electronic communications services.

The Forum will be chaired by a representative of ComReg and membership of the Forum will be open to all licensed FWALA operators.

The forum shall:

1. Agree procedures and practices for frequency coordination (International & Domestic) between FWALA networks and between FWALA networks and other services where necessary;
2. Consider and contribute to developments of the FWALA licensing scheme;
3. Consider any other issues of common interest to FWALA operators;
4. Contribute, where possible, to the promotion of the profile of FWA in Ireland both within the industry and among consumers as a 'real-alternative' for broadband service provision;
5. Shall conduct a quarterly review of the work of the Forum and make recommendations on the future scope of the Forum.

Chairman:

Tara Kavanagh
Commission for Communications Regulation
E-mail: tara.kavanagh@comreg.ie
Tel: 01-804 9623

**FWALA – 3.5GHz
Domestic Frequency Coordination**

Licensed Operator Code of Practice

DRAFT

Document History

Draft	Date	Editor	Comment
Version 1.0	04/05/05	FWALA Forum Chair	
<u>Version 1.1</u>	<u>10/08/05</u>	<u>FWALA Forum Chair</u>	
<u>Version 1.2</u>	<u>15/08/05</u>	<u>FWALA Forum Chair</u>	<u>For review; Comments called for, to be received before 29 August, 2005</u>
<u>Version 1.3</u>	<u>14/06/06</u>	<u>FWALA Forum Chair</u>	<u>Inserted Bcloak Edge Mask agreed at 3rd FWALA Forum meeting</u>
<u>Version 1.4</u>	<u>14/06/07</u>	<u>FWALA Forum Chair</u>	<u>Inserted Block Edge Mask from ECCREC(04)05</u>
<u>Version 1.5</u>	<u>19/06/07</u>	<u>FWALA Forum Chair</u>	<u>Inserted changes to Annex following 6th FWALA Forum meeting</u>

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1 Introduction

1.1 Fixed Wireless Access Local Area

Fixed Wireless Access Local Area (FWALA) is a licensing scheme for the provision of wireless broadband access to end-users. While this code of practice focuses on the 3.5 GHz band, the FWALA scheme is available to systems operating in the 3.5GHz, 10.5GHz and 26GHz bands. Unless ComReg has indicated otherwise, licences are issued on a first-come, first served basis and details of the licensing regimes can be found in ComReg documents 03/3406/17R and 03/9706/17a for 10.5/26GHz and 3.5GHz respectively.

Licensees are free to deploy equipment under the terms of their FWALA licence within a ‘Service Area’ specified in the licence and are also responsible for ensuring that any exported interference as a result of these deployments does not exceed a specific level calculated at a fixed distance from the centre of the local area.

As a general policy ComReg will issue licences for wireless systems on a technology neutral basis and this has been the approach under the FWALA scheme.

1.2 The FWALA Forum

A FWALA Forum has been established to address issues of common interest to FWALA licensees and is chaired by ComReg. All FWALA licensees are members of this forum. The FWALA Forum held its first meeting on 24 November 2004.

1.3 Principles of the Codes of Practice

While every effort has been made by ComReg to minimise the possibility of interference between licensed operators in licensing FWALA systems, it is possible that situations will arise from time to time where it is necessary to coordinate the usage of frequencies between different FWALA networks in order to facilitate the operation of these networks. The FWALA Forum has agreed that the most appropriate way to deal with such instances is by means of a Code of Practice on Domestic Frequency Coordination.

This Code of Practice is based on the following principles:

- It is not possible to provide an environment which is completely free of interference;
- Operators have a number of mitigation options available to deal with interference problems;
- Operators require a level of certainty in frequency planning for their network;
- It is not possible to anticipate every possible interference scenario – therefore a pragmatic approach is required;

Domestic Frequency Coordination – Code of Practice

- Operators with neighbouring networks may arrive at sharing solutions independent of ComReg;
- That a Code of Practice be considered best practice in the absence of any other agreements;
- ComReg is responsible for the international coordination of radio systems between the Republic of Ireland and other countries;
- Management of the deployment of network infrastructure, including customer premises equipment, in the service area and within the licensed frequency channel is generally a matter for the operator;
- The local area approach and the requirement to comply with the ~~30km~~ maximum permissible field strength contour (~~12km maximum permissible field strength contour for the 26GHz band~~) will result in differing EIRP values for base-stations and customer premises equipment deployed within the licensed service area;
- The approach in Ireland should as far as possible take into consideration the approach recommended by CEPT¹;
- That this Code of Practice is a working document and may be subject to review by the FWALA Forum ~~from~~ time to time;
- That the Block Edge masks detailed in Annex 1 may be changed to take into consideration technological changes/developments that may arise.

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Note that any provision or agreement within a Code of Practice does not absolve a licensee from observing the terms and conditions of any FWALA licence held or from complying with any other statutory obligations.

1.4 Amendments to the Code of Practice

This Code of Practice may be amended as necessary with the agreement of the FWALA Forum and ComReg.

¹ European Conference of Postal and Telecommunications Administrations (www.cept.dk or www.ero.dk). Reference ERC/REC 14-03 and ECC Report 033 and ECC/REC(04)05.

2 Spectrum Bandplan in the 3.5GHz band

The spectrum available for licensing in the 3.5GHz band is shown in Figure 1 – specifically frequency channels A, B, C and D. It is noted that guard bands between operators licensed on adjacent frequency channels must be accommodated within the licensed channel of each operator.

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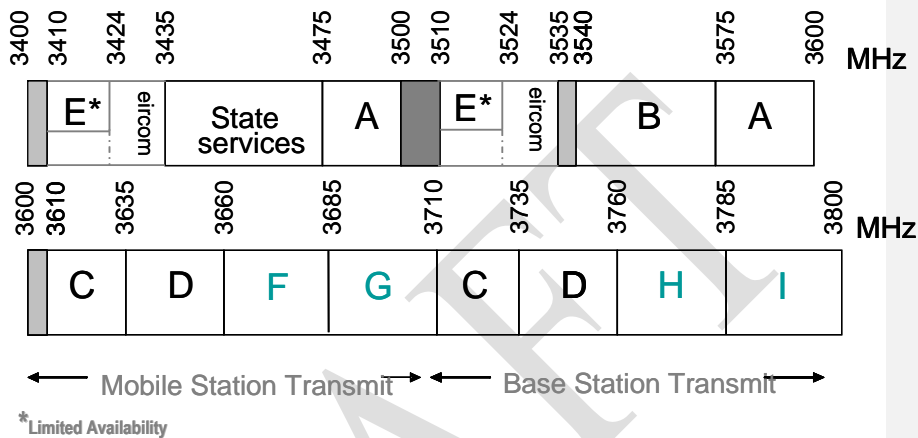


Figure 1 – 3.5GHz Spectrum available under FWALA

As noted previously, FWALA licences are issued on a technology neutral basis and therefore it is certain that systems of differing technical characteristics and deployment will be licensed in adjacent frequency channels.

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23 Definitions

~~{Insert necessary definitions here}~~

FWALA – Fixed Wireless Access Local Area (S.I. 79 of 2003 as amended)

EIRP – ~~Effective Equivalent~~ Isotropically Radiated Power: The product of the power supplied to the antenna and the antenna gain in a given direction relative to an isotropic antenna (absolute or isotropic gain)² ~~{as per Radio Regulations}~~

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² Ref: Article 1.161 of the Radio Regulations, Edition of 2004

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Block Edge Mask – 3.5GHz Band

The spectrum available for licensing in the 3.5GHz band is shown in Figure 1 – specifically frequency channels A, B, C and D. It is noted that guard bands between operators licensed on adjacent frequency channels must be accommodated within the licensed channel of each operator.

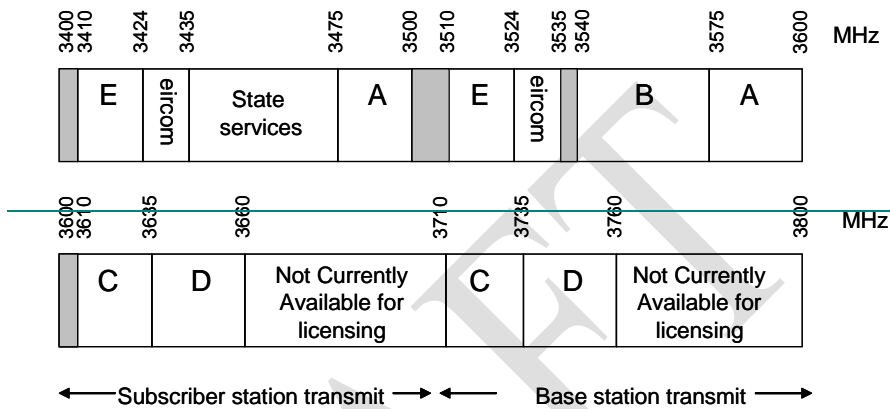


Figure 1 – 3.5GHz Spectrum available under FWALA

As noted previously, FWALA licences are issued on a technology neutral basis and therefore it is certain that systems of differing technical characteristics and deployment will be licensed in adjacent frequency channels.

It is generally recognised, and the FWALA Forum has agreed, that the most spectrally efficient and liberal method to minimise the possibility of interference between operators as a result of emissions from one licensee into a frequency channel licensed to another licensee is to agree a ‘Block Edge Mask’ common to all licensees. The Block Edge Mask defines the transmission mask in terms of power spectral density (dBW/MHz) at the upper and lower edge of each licensed frequency channel (i.e. A, B, C or D above).

Licensees are also free to reach mutual agreements with other licensees on frequency coordination but the block edge mask will be considered best practise for the resolution of disputes relating to interference between licensees.

4 Code of Practice – 3.5 GHz band

It is generally recognised, and the FWALA Forum has agreed, that the most spectrally efficient and liberal method to minimise the possibility of interference between operators as a result of emissions from one licensee into a frequency channel licensed to another licensee is to agree use a 'Block Edge Mask' common to all licensees. The Block Edge Mask given in Annex 1 defines the transmission mask in terms of power spectral density (dBW/MHz) at the upper and lower edge of each licensed frequency channel (i.e. A, B, C or D above).

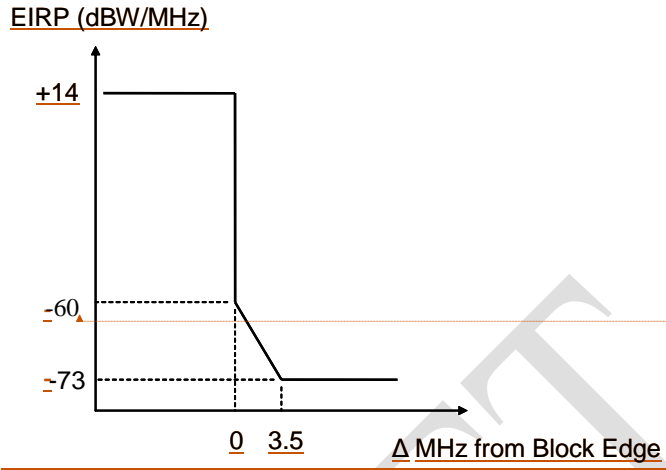
Licensees are also free to reach mutual agreements with other licensees on frequency coordination but the Block Edge Mask in Annex 1 will be considered best practice for the resolution of disputes relating to interference between licensees.

To this end, Licensees agree:

- (1) to notify ComReg of any coordination agreement with other licensees;
- (2) to resolve any interference dispute between them. Where resolution can not be agreed ComReg shall mediate on the basis of the dispute resolution procedure agreed by the FWALA Forum ~~{enter document reference – procedure to be developed}~~;
- (3) to a maximum EIRP level from any transmitter of 14dBW/MHz. Please note that this power level is set as an absolute maximum and that licensees must ensure compliance with the 33dB μ V/m signal level limit in accordance with their licence when setting the transmitter power of any transmitter licensed under the FWALA scheme;
- (4) to ~~use of the block edge mask~~ comply with the block edge mask -power limits defined in Annex 1 Figure A.12 in the region of at the lower and upper edges of their licensed spectrum frequency channel;
- (5) that site specific deployments may give rise to technical considerations that cannot be anticipated (e.g. intermodulation products and adjacent spectrum block emissions) which may necessitate specific site engineering solutions and that the licensees will take appropriate action to minimise these.

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Figure 2: Licensed Frequency Channel Block Edge Mask³

³ Ref: [ECC Report 033 and Draft ECC/REG/\(04\)05](#)

Annex 1: 3.5 GHz Block Edge Mask

Scenario 1: Mutual Agreement

The Block Edge Mask given in Figure 1 is taken from ECC Recommendation (04)05 and may be used to limit interference between adjacent channel, co-located FWALA service areas where operators have reached mutual agreement. Operators of the adjacent blocks may deviate from the Block Edge Mask requirement, subject to their mutual agreement (e.g. involving co-ordinated deployment, mitigation techniques etc).

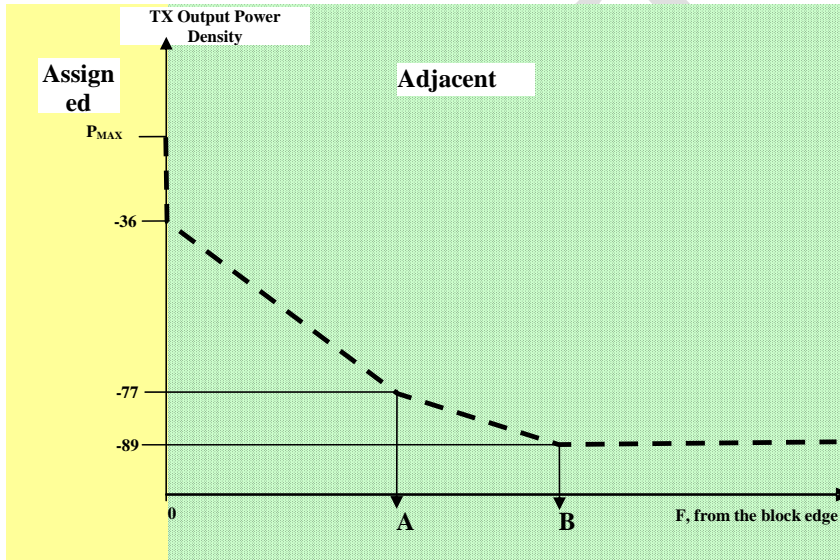


Figure 1: Block Edge Mask where there is mutual agreement between operators.⁴

Pmax = 14dBW/MHz

Assigned Block Size (MHz)	A = 20% of Assigned Block (MHz)	B = 35% of assigned Block (MHz)
25	5	8.75
35	7	12.25

Note: When adjacent blocks are of unequal size, the A and B of the smaller of adjacent block is applied

⁴ Ref: ECC/REC/(04)05

Scenario 2: No Agreement

The block edge mask shown in Figure 2 is to be used where there is no agreement in place between adjacent channel co-located operators.

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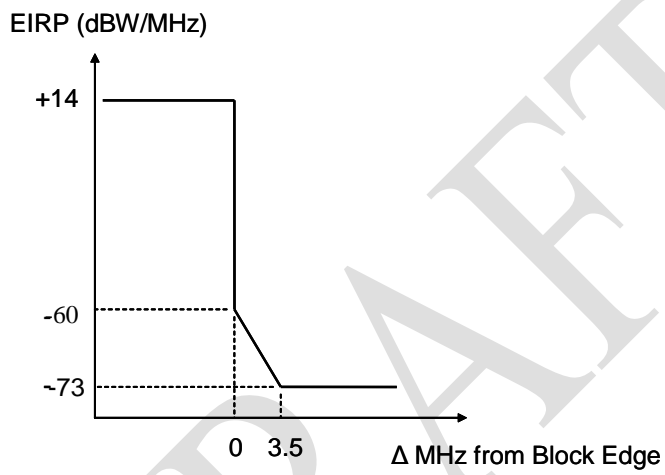


Figure 2: Block Edge mask where there is no agreement between adjacent channel, co-located operators.

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⁵ Ref: ECC Report 033

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Commission for
Communications Regulation

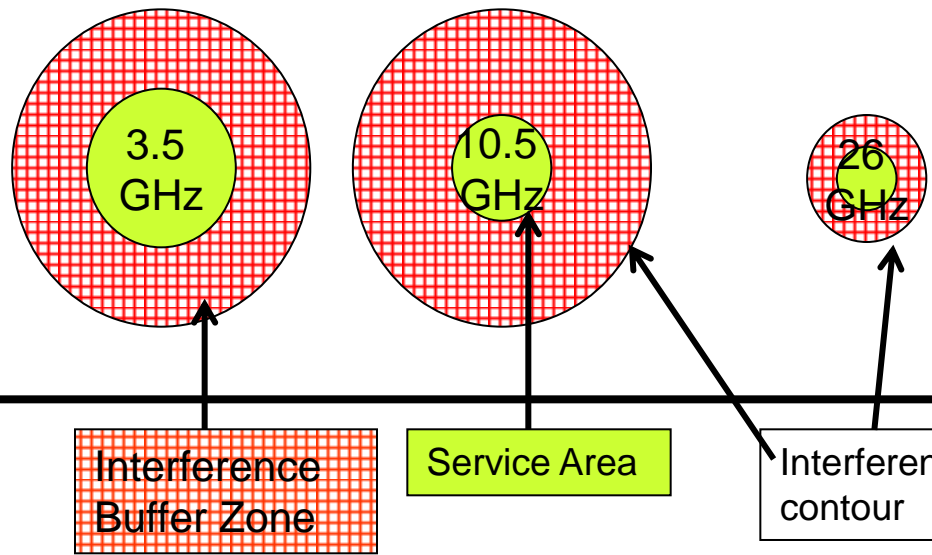
FWALA Forum
6th Meeting
19 June 2007

Agenda

- **Greater flexibility in network deployment**
 - Extended service areas
 - Geographical service area proposals
- **Additional spectrum**
- **Introducing Mobility**
- **FWALA in 26 GHz band**

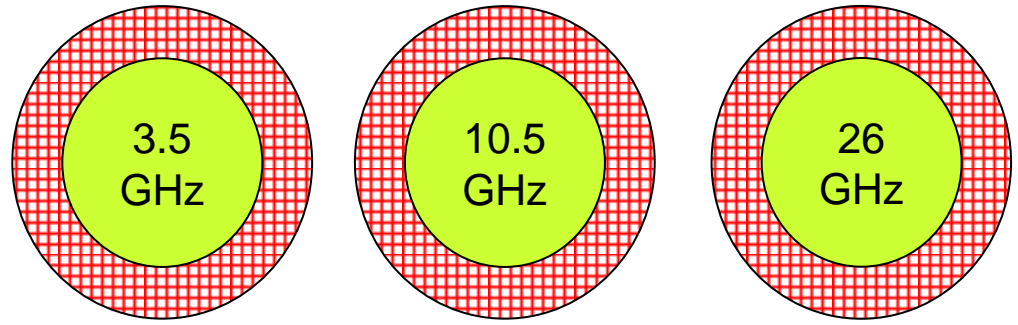
Revised FWALA Parameters

Previous Service Area and Interference Contour Parameters



Band	3.5 GHz	10.5 GHz	26 GHz
Service Area			
Radius (km)	15	10	6
Interference Contour			
Radius (km)	30	30	12
Service Area (km ²)	707	314	113

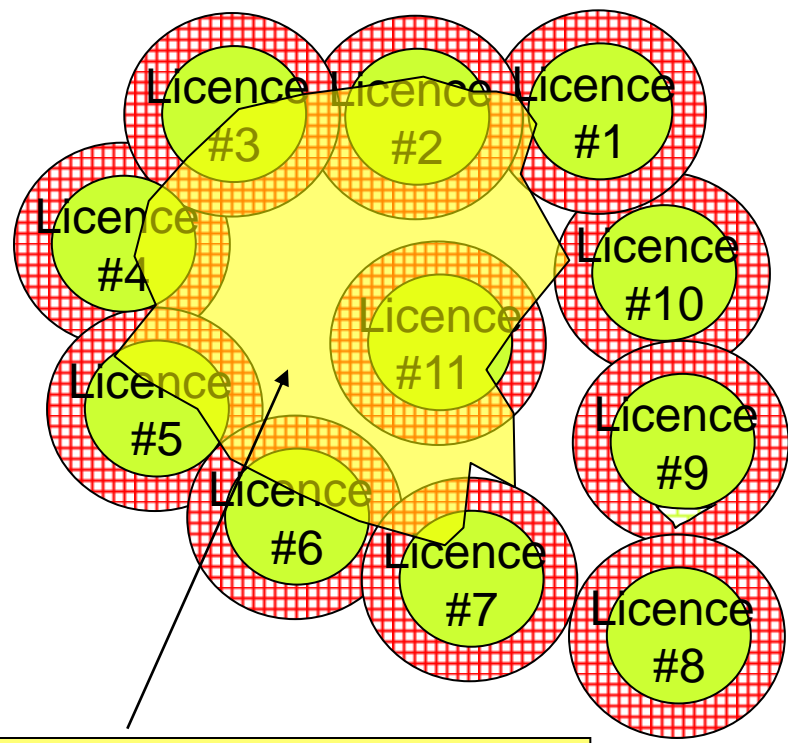
New Service Area and Interference Contour Parameters



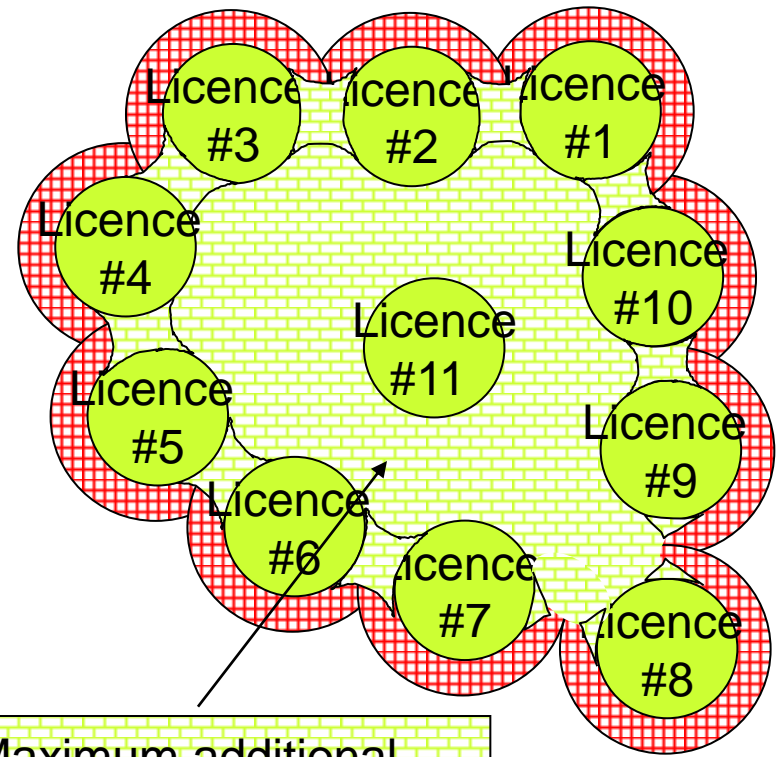
Band	3.5 GHz	10.5 GHz	26 GHz
Service Area			
Radius (km)	20	20	20
Interference Contour			
Radius (km)	30	30	30
Service Area (km ²)	1,256	1,256	1,256
% Increase in Service Area	78%	300%	1011%

Latest FWALA Developments

- Geographical Service Areas Consultation**

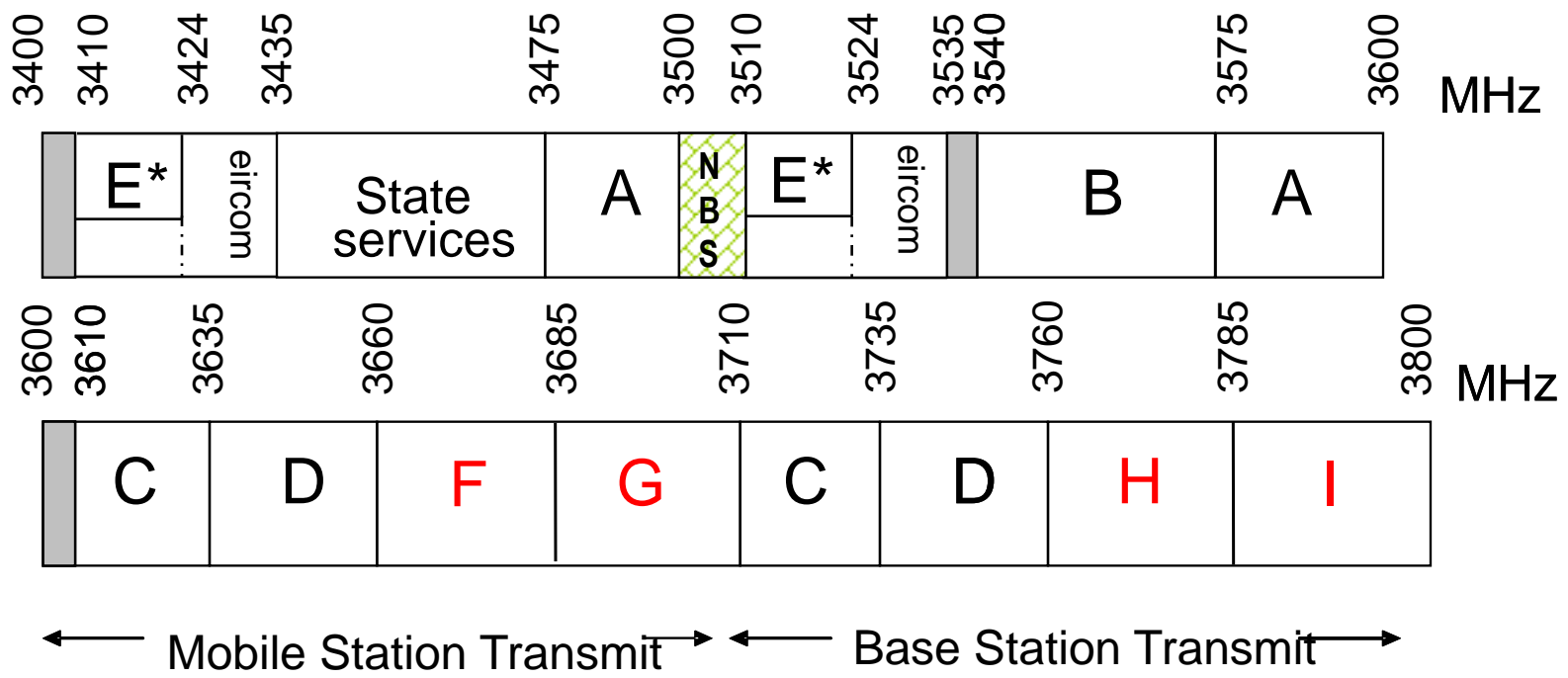


Example of practical GSA area applied for



Maximum additional GSA area that can be applied for

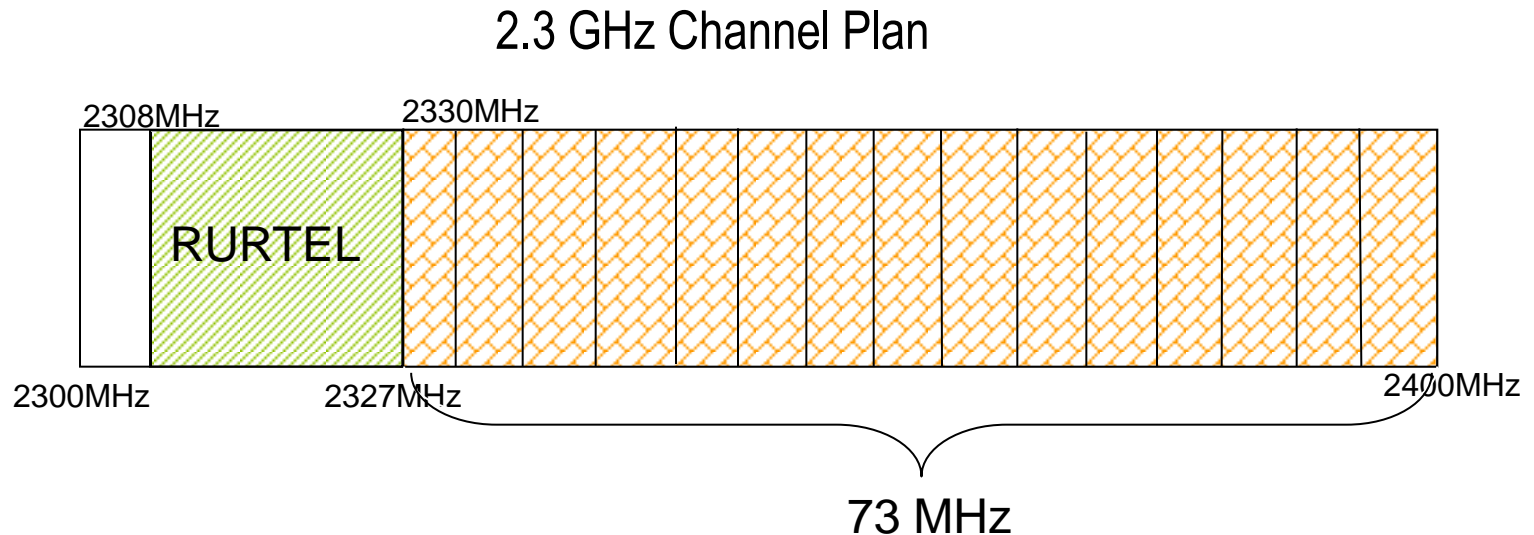
Release of Additional FWALA Spectrum



* Limited Availability

- Propose to make up to 4 TDD channels F, G, H and I available for FWALA following a consultation to assess demand.
- Considering using 3500 – 3510 MHz initially only for National Broadband Scheme under FWALA.

Future Spectrum Release



- Band currently used in USA and Asia for WiMax.
- ComReg proposes to consult on licence type (national, local area etc), duration, and award format.
- 2.5 – 2.6 GHz is licensed until at least 2014.

Mobility Issues in 3.4-3.8 GHz

Technical Issues to be resolved:

- Local Area Nature of FWALA leads to a number of Technical Issues that need to be resolved
- Use of different technologies co-channel in adjacent service areas: how to avoid interference?
- Is it possible to prevent roaming onto another operators network which uses the same channel in an adjacent area?
- Is it possible to prevent users roaming into the interference zone – and causing interference to adjacent network?
- Is mobility realistic in current FWALA environment?
- Currently no Harmonised Standard available for mobile use in 3.4-3.8 GHz band. ETSI considering development of such
- Draft EC Decision under consideration in RSCOM (next slide)

Draft EC Decision: mobile technical limits

Mobile terminal stations in 3.4-3.8 GHz (note different timescales for 3.4-3.6 (2008) & 3.6-3.8 GHz(2012)):

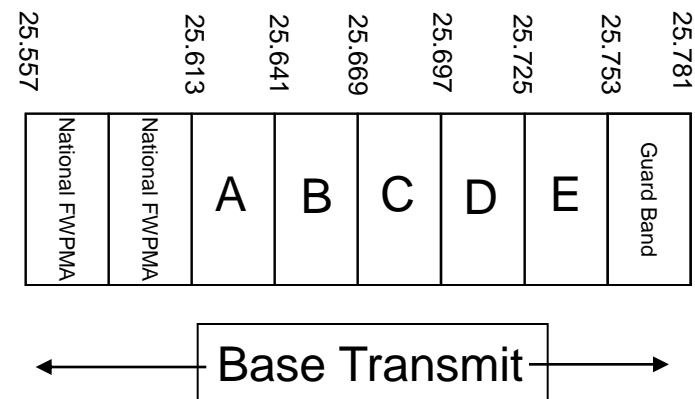
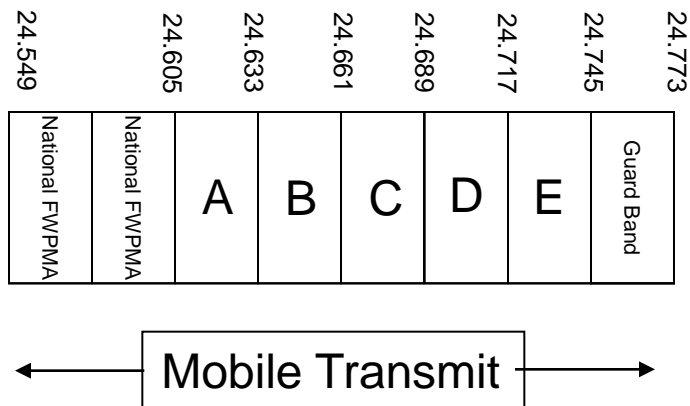
- **Maximum radiated power density of 25 dBm/MHz;**
- **Interference avoidance equivalent to a minimum Automatic Transmission Power Control (ATPC) range of 15 dB;**
- **When blocks are assigned contiguously (without external guard bands) the transmit centre frequency of the terminal station shall not be closer than one channel width from the block edge unless co-ordination between operators is undertaken, which may include the application of other specific interference mitigation measures.**

Mobility in FWALA

- Need input from operators on how mobility might work.
- Monitoring developments in CEPT and EC
- Will need to consult before any final changes to the FWALA Regs permitting mobility are made.

26 GHz FWALA Licences

- Propose to re-open the 26 GHz band for FWALA after band was frozen on 5th April 2006.
- Valid 26 GHz applications received prior to 5th April 2006 to be served first
- Remaining spectrum to be released following a comparative evaluation as held previously.
- Autumn 07.



Source: ComReg

FWAFor07(02)

Date: 19 June 2007

**Subject: Minutes of 6th meeting of
FWALA Forum**

**FWALA Operator's Forum
Minutes of 6th Meeting
19 June 2007 / 10.00am – 12.30pm
Venue: ComReg Offices**

Attendees:

Name	Organisation
Tara Kavanagh (Chairman)	ComReg
Samuel Ritchie	ComReg
Brian Whelan	ComReg
Kevin Kennedy	ComReg
Patrick Mulvey	ComReg
Peter Hendrick	Airspeed
Paul Cunane	Westnet
Ruairi Jennings	Irish Broadband
Brent Smith	Clearwire Ireland
Brefne Sweeney	Clearwire Ireland
Conor Twomey	Fastcom
Cyril Moriarty	Last Mile Wireless
Charl Tintinger	Digiweb

1. Introduction and Adoption of the Agenda:

The Chairman welcomed all the participants to the meeting and outlined some of the changes in personnel that had taken place in Comreg since the last FWALA Forum meeting. Brian Whelan has taken over the role Licensing Operations manager. Patrick Mulvey is the licensing engineer with responsibility for FWALA licensing and Kevin Kennedy is in a new role as Spectrum Development Manager.

The Forum adopted the agenda as shown in Annex 1.

1.1 Approval of minutes of 5th meeting

No comments were received on the minutes of the 5th meeting of the forum. The minutes from the 4th meeting were approved.

2. Latest FWALA Developments

ComReg gave a short update on the latest developments in FWALA licensing which included that revised service areas for all FWALA bands and the ongoing consultation on Geographical Service Areas. ComReg presented document FWAFor(07)Info 1

which contained the draft EC Decision on the 3.4 – 3.8 GHz band which would permit mobility in this band. Comreg stated that it was broadly supportive of the Decision but had concerns about some of the articles in the Decision regarding the data rate and the need to register base stations. The Forum supported these concerns. ComReg will be sending its views to the Commission on the document will keep the Forum updated on the progress of this Decision which will be binding on member states.

3. Additional Spectrum and Mobility

ComReg presented a revised band plan of the 3.5 GHz band indicating four additional TDD channels in the 3.6 – 3.8 GHz part of the band. Comreg is proposing to make these available under the existing FWALA licensing scheme. ComReg also presented the 2.3 GHz channel plan and stated that it is proposed that ComReg conduct a consultation on this spectrum seeking views from interested parties on how best to assign this spectrum and in what format.

ComReg then went on to address the subject of mobility in the FWAL bands and outlined some of the potential interference issues that may arise if mobility was permitted. The Forum members did not share ComRegs concerns about potential interference and were of the view that interference issues would be addressed by the network and that if a consumer was in an area that was not served by their operator then they would simply not get on to the network and therefore terminal to terminal or terminal to base station interference issues would not arise. Forum member were of the view that ComReg should proceed with permitting mobility and then look at a coordination process to deal with any potential interference issues that might arise once there was more clarity on the technologies that would be used.

4. Frequency Coordination

4.1 Review of Draft Code of Practise:

ComReg presented document FWAF05(05)03 version 1.4 on Domestic frequency Coordination. ComReg had inserted a new block edge mask taken from ECC Recommendation (04)05 into this document and looked for approval from the Forum members. The Forum members were of the view that the revised block edge mask was suitable in cases where there was mutual coordination between adjacent operators however they were of the view that the previous block edge mask should be imposed upon new operators until a mutual agreement could be reached and in cases where no agreement could be reached between adjacent operators. The document should also make it clear that the block edge mask can be revised to take into account any technological changes that may arise. ComReg stated that it would incorporate these changes into the document and circulate to the FWALA Forum members with a view to getting an agreement via correspondence before the next Forum meeting.

Action: The Revised Code of Practice Document is attached in Annex 2

4.2 International frequency co-ordination:

Samuel Ritchie of ComReg presented a draft MoU that both ComReg and Ofcom are hoping to agree before the end of the year. ComReg and Ofcom still have to reach

Annex: 7 Meeting 7, November 22 2007



FWALA Operator's Forum
7th Meeting
ComReg Offices
10.00am, 22 November 2007

Agenda

1. Introduction
 - a. Approval of Agenda (FWAFor(07)03)
 - b. Approval of Minutes of 6th meeting/Review of Action Points

2. Latest FWALA Developments

3. Draft European Commission Decision on
Broadband Wireless Access in 3.4-3.8 GHz band

- Coffee Break -*

4. FWALA Compliance

5. Review of FWALA Forum Terms of Reference
 - a. Revision of Terms of Reference – FWAFor(04)02Rev1

6. Date for next Forum Meeting
 - a. Proposed date 3 April 2008

7. AOB

agreement on the distance at which a coordination procedure will be triggered. ComReg stated that it will look at possible worse case scenarios and use that to help at setting this distance.

5. Review of FWALA Forum Terms of Reference

The Chairman presented FWALA Forum document FWAFor(04)02Rev 1 which proposed a small change to the FWALA Terms of Reference (ToR) to conduct a review of the forum annually and asked for comments from the Forum members whether they wished to see the Forum continue. There was support from all participants that the Forum continue with a proposal to review the ToR at each meeting to take in to account the fast pace of change within the industry. ComReg accepted this proposal and the revised ToR are attached in Annex 3.

6. Any other Business (AOB)

Airspeed asked what the status was with regards to the 26 GHz spectrum. ComReg stated that it was in the process of carrying out a review addressing the reasons why there were no applications for any of the national point to point and point to multipoint licences. In the parallel with this review ComReg will look at ways of making some of the 26 GHz spectrum available for FWALA licences.

Samuel Ritchie of ComReg gave a brief overview of the All Island licensing process and stated that the relevant documentation relating to this licensing process will be circulated to FWALA Forum members once it becomes available.

Action: ComReg to circulate the All Island document when it becomes available.

7. Date for next Forum Meeting

The next meeting of the FWALA Forum will take place on **2 October 2007** at a location and time to be confirmed.

**Tara Kavanagh
Chairman
FWALA Forum
19 June 2007**

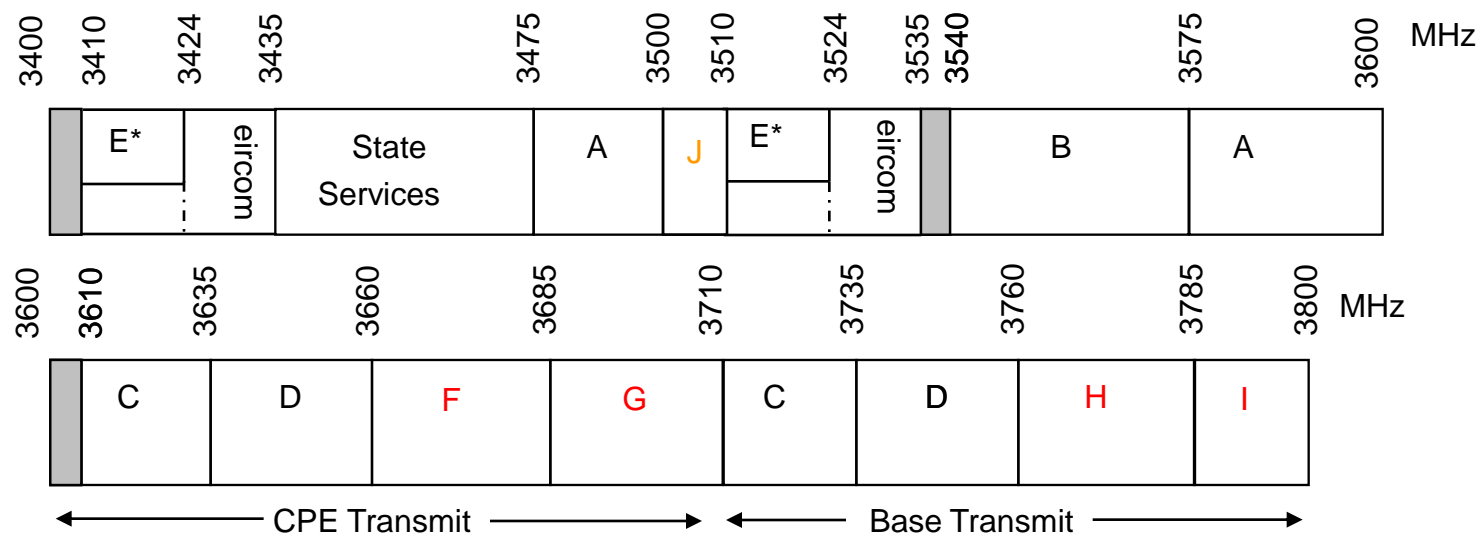
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Commission for
Communications Regulation

FWALA Forum
7th Meeting
22 November 2007

Additional 3.5 GHz FWALA Spectrum





EUROPEAN COMMISSION
Information Society and Media Directorate-General
Electronic Communications
Radio Spectrum Policy

Brussels, 29 November 2007
DG INFSO/B4

RSCOM07-90

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RADIO SPECTRUM COMMITTEE

Working Document

Subject: BWA in the band 3.4-3.8 GHz – revised draft proposal for a Commission Decision

This is a Committee working document which does not necessarily reflect the official position of the Commission. No inferences should be drawn from this document as to the precise form or content of future measures to be submitted by the Commission. The Commission accepts no responsibility or liability whatsoever with regard to any information or data referred to in this document.



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E-mail : info-rsc@ec.europa.eu

Draft

COMMISSION DECISION

of [...]

on the harmonisation of the frequency band 3400-3800 MHz for terrestrial systems capable of providing electronic communications services in the Community

(Text with EEA relevance)

THE COMMISSION OF THE EUROPEAN COMMUNITIES,

Having regard to the Treaty establishing the European Community,

Having regard to Decision No 676/2002/EC of the European Parliament and of the Council of 7 March 2002 on a regulatory framework for radio spectrum policy in the European Community (Radio Spectrum Decision)¹, and in particular Article 4(3) thereof,

Whereas:

- (1) In its resolution of 14 February 2007², the European Parliament emphasised that implementation of the new conditions for spectrum usage must ensure an unrestricted choice of the technology which can be used and of the service to be delivered in a given spectrum band in order to promote competition and innovation, within the context of the Lisbon Strategy. The Parliament also emphasised the importance of communications for rural and less developed regions, their access to broadband through mobile communications and new wireless technologies that provide efficient solutions to achieving coverage of the full territory of the 27 EU Member States with a view to the sustainable development of all areas.
- (2) It is important for the internal market that the conditions of use of the band 3400-3800 MHz are harmonised so as to facilitate the introduction of electronic communications services and to allow consumers as much freedom in the choice of services and spectrum users in the choice of technologies as possible. Availability of radio spectrum has an important role to play in ensuring the achievement of the Lisbon agenda and the i2010 initiative— *A European Information Society for growth and employment*³ to harness the potential of the digital economy to deliver growth, jobs and widespread availability of modern services. This initiative recalls the importance of advanced and secure broadband communications to meet the challenges of digital convergence and to ensure that European households and businesses work more efficiently and enjoy a rich multimedia experience on a widespread basis.

¹ OJ L 108, 24.4.2002, p. 1

² EP Resolution Towards a European policy on the radio spectrum, 14.02.07;

³ Communication from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions, COM(2005) 229 final.

- (3) Technological neutrality and service neutrality as policy goals have also been underlined by Member States in the opinion of the Radio Spectrum Policy Group (RSPG) on WAPECS of 23 November 2005 to achieve a more flexible use of spectrum, which recommends that these policy goals should not be introduced abruptly, but in a gradual manner to avoid disruption of the market. The Commission has stated its views on a more flexible use of spectrum in a Communication⁴ which inter alia addresses the band 3.4-3.8 GHz. In the same way that this policy has already created opportunities for existing users of the 900 MHz and 1800 MHz bands through Commission Decision [...], it is proportionate, non-discriminatory and consistent to implement flexibility in the 3.4-3.8 GHz band.
- (4) The designation of the 3400-3800 MHz bands for fixed, nomadic as well as mobile applications is an important element addressing the convergence of the mobile, fixed and broadcasting sectors and reflecting technical innovation. The services provided in this frequency band should mainly target end-user access to broadband communications.
- (5) It is expected that the wireless broadband electronic communications services for which the 3400 – 3800 MHz band is to be designated will to a large extent be pan-European in the sense that users of such electronic communications service in one Member State could also gain access to equivalent services in any other Member State.
- (6) Pursuant to Article 4(2) of the Radio Spectrum Decision, the Commission issued a mandate dated 4 January 2006⁵ to the European Conference of Postal and Telecommunications Administrations (hereinafter referred as “CEPT”) to identify the conditions relating to the provision of harmonised radio frequency bands in the EU for Broadband Wireless Access (BWA) applications.
- (7) In response to the Mandate of 4 January 2006⁵, the CEPT has produced a report (CEPT Report 015) on BWA. This report concludes that the deployment of fixed, nomadic and mobile networks is technically feasible within the frequency band 3400-3800 MHz under the technical conditions described in ECC Decision ECC/DEC/(07)02 and ECC Recommendation ECC/REC/(04)05. Furthermore, it concludes that the two bands, 3400-3600 MHz and 3600-3800 MHz, have different sharing considerations due to different services, other than BWA, utilising these bands. The generic technical conditions applicable to fixed and nomadic networks are described in Harmonised Standards ~~EN~~ EN 302 326-2 and EN 302 326-3, which also include definitions for a Central Station (CS) and a Terminal Station (TS). The term CS may be considered equivalent to the term base station in the context of mobile cellular networks.
- (8) The results of the mandate to the CEPT should be made applicable in the Community and implemented by the Member States without delay given the market demand for the introduction of terrestrial electronic communication services providing broadband access in these bands. Nevertheless, the differences in current use of as well as in market demand for using the sub-bands 3400-3600 MHz and 3600-3800 MHz at the national level may justify a different target date for the designation and availability of the two sub bands.

⁴ Commission Communication on "Rapid access to spectrum for wireless electronic communications services through more flexibility", COM(2007)50

(9) The designation and making available of these bands in accordance with the results of the Mandate on BWA recognises the fact that there are other existing applications within these bands and does not preclude the future use of these bands by other systems and services to which these bands are allocated in accordance with the Radio Regulations. Appropriate sharing criteria for coexistence with other systems and services in the same and adjacent bands have been developed in ECC Report 100. ~~In general, if suitable separation distances are set up between systems harmful interference can be avoided.~~

(10) Block Edge Masks (BEMs) are technical parameters that apply to the entire block of spectrum of a specific user, irrespective of the number of channels occupied by the user's chosen technology. They are regulatory requirements aimed at interference avoidance between neighbouring networks and are without prejudice to limits set in equipment standards under the R&TTE Directive.

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(11) A BEM for terminal stations is not required because the protection requirements would be sufficiently covered by the BEM for central stations and by the additional limits for mobile terminal stations.

~~(10)~~(12) Harmonisation of technical conditions for the availability and efficient use of spectrum does not cover assignment, licensing procedures and timing, nor the decision whether to use competitive selection procedures for the assignment of radio frequencies, which will be organised by Member States in line with Community law.

~~(11)~~(13) Differences in the national legacy situations could result in competitive distortions. The existing regulatory framework gives Member States the tools to deal with these problems in a proportionate, non-discriminatory and objective manner, subject to Community law including the Authorisation Directive and the Framework Directive.

~~(12)~~(14) In order to ensure effective use of the band 3400-3800 MHz also in the longer term, administrations should continue with studies that may increase efficiency and innovative use, such as meshed network architectures. Such studies will be taken into account when considering a review of this decision.

~~(13)~~(15) The measures provided for in this Decision are in accordance with the opinion of the Radio Spectrum Committee.

HAS ADOPTED THIS DECISION:

Article 1

The objective of this Decision is to harmonise, without prejudice to the protection of other existing use in this band, the conditions for the availability and efficient use of the 3400-3800 MHz band for terrestrial systems capable of providing electronic communications services.

Article 2

(1) Member States shall on a non-exclusive basis designate and make available by 1 July 2008 the band 3400-3600 MHz for terrestrial electronic communications networks, in compliance with the parameters given in Annex 1.

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(2) Member States shall on a non-exclusive basis designate by ~~1~~ 1 January 2012 and subsequently make available the band 3600-3800 MHz for terrestrial electronic communications networks, in compliance with the parameters given in Annex 1.

(3) Member States shall ensure that networks referred to in paragraphs (1) and (2) give appropriate protection to systems in adjacent bands.

Article 3

Member States shall allow the use of the 3400-3800 MHz band in accordance with Article 2 for fixed, nomadic and mobile electronic communications networks.

Article 4

Member States shall keep the use of the band 3400-3800 MHz under review to ensure the efficient use thereof and report to the Commission any need for a revision.

Article 5

This Decision is addressed to the Member States.

Done at Brussels, [...]

*For the Commission
Member of the Commission*

ANNEX 1

Parameters referred to in Article 2

The following Block Edge Mask (BEM) ~~shall be applied as is~~ an essential component of conditions necessary to ensure co-existence in the absence of bilateral or multilateral agreements between neighbouring networks, ~~without precluding~~ Less stringent technical parameters, if agreed among the operators of such networks, can also be used. Equipment operating in this band may also make use of ~~e.i.r.p.~~ EIRP limits other than those set out in the BEM below provided that appropriate mitigation techniques are applied which comply with Directive 1999/5/EC and offer at least an equivalent level of protection to that provided by the BEM.

A) Limits for ~~in-band~~ block emissions:

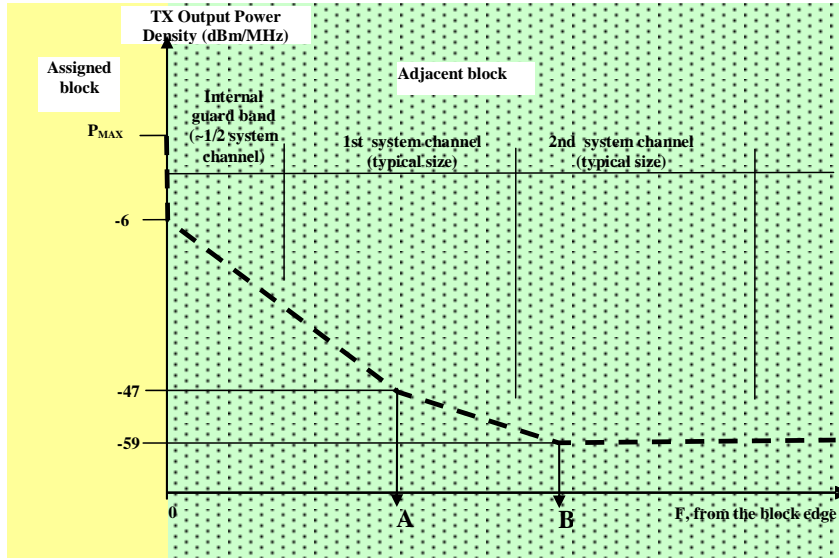
Station Type	Max EIRP spectral density (dBW <u>dBm</u> /MHz) (Including tolerances and ATPC range, Note 1)
Central Station (CS) (and Repeater Station(RS) down-links)	+ 23 <u>53</u> Note 2 <u>1</u>
Terminal Station (TS) outdoor (and RS up-links)	+ 20 <u>50</u> Note 3
TS (indoor)	+ 12 <u>42</u>
<p>Note 1: the total power delivered by a transmitter to the antenna of a station should not exceed 13 dBW, ITU RR S21.5 refers</p> <p>Note 2<u>1</u>: The CS EIRP <u>spectral</u> density value given in the table is considered suitable for conventional 90 degrees sectorial antennas. Administrations may consider to adjust this value if other types of antennas are used (e.g. decrease the limit for omni directional antennas, or increase when narrow sector or adaptive antennas are used)</p> <p>Note 3: If Administrations wish to consider higher EIRP limits (e.g. for improving coverage in remote rural areas), this should be achieved by using the high gain directional antennas, not by increasing output power, however the higher interference potential of EIRP increase should be carefully considered</p>	

Table 1: EIRP spectral density limits for fixed and nomadic deployments between 3400-3800 MHz

These limits in Table 1 are valid for fixed and nomadic deployment ~~of BWA~~ and should be extended for mobile deployment assuming the following technical limits for mobile terminal stations (i.e. handheld terminals):

- Maximum radiated power density of 25 dBm/MHz;
- Minimum ATPC range (15 dB).

B) Limits for out-of-band emissions (Block Edge Mask for Central Stations):



Frequency offset break points for the CS mask	Definition (% of the size of the assigned block)
A	20%
B	35%

Note: The percentages given in the “Definitions” column refer to the smaller of adjacent blocks, if blocks are of unequal size.

Figure 1: Central Station Block Edge Mask

Frequency offset	CS Transmitter Output Power Density Limits (dBm/MHz)
In-band (within assigned block)	See Table 1
$\Delta F=0$	-6
$0 < \Delta F < A$	$-6 - 41 \cdot (\Delta F/A)$
A	-47
$A < \Delta F < B$	$-47 - 12 \cdot ((\Delta F - A)/(B - A))$
$\Delta F > B$	-59

Table 2: Tabular description of Central Station Block Edge Mask

Source: ComReg

FWAFor07(04)

Date: 22 November 2007

Subject: Minutes of 7th meeting of
FWALA Forum

FWALA Operator's Forum Minutes of 7th Meeting

Attendees:

Name	Organisation
Tara Kavanagh (Chairman)	ComReg
Brian Whelan	ComReg
Patrick Mulvey	ComReg
Paul Cunane	Westnet
Brian O Dwyer	Irish Broadband
Ian Watson	Irish Broadband
Brent Smith	Clearwire Ireland
Ross Palmer	Fastcom
Conor Twomey	Fastcom
Cyril Moriarty	Last Mile Wireless
Shane Gibbons	Last Mile Wireless
Ray O Leary	High Speed Data

1. Introduction and Adoption of the Agenda:

The Chairman welcomed all the participants to the 7th FWALA Forum meeting. The Forum adopted the agenda as shown in Annex 1.

1.1 Approval of minutes of 6th meeting

No comments were received on the minutes of the 6th meeting of the forum. The minutes from the 6th meeting were approved.

2. Latest FWALA Developments

The Chairman gave a short update on the latest developments in FWALA licensing which included;

- The response to consultation on Geographical Service Areas (ComReg document 07/71).
- Revised FWALA guidelines 06/17R3.
- 3.5 GHz FWALA Code of Practice published in document 07/74
- Re-opening the 26 GHz band for FWALA applications in ComReg document 07/91.

The Chairman outlined some of the options that were being considered by ComReg for the licensing of the additional spectrum in the 3.6 – 3.8 GHz band, channels F, G, H and I. The Forum members were broadly supportive of the proposed options. Irish Broadband asked that ComReg put as much information as possible into the

consultation in terms of proposed licence term, fees etc as this would result in a more meaningful consultation process. ComReg stated that it expected that the consultation will be published in Q1 of 2008.

3. Draft European Commission Decision on Broadband Wireless Access in 3.4-3.8 GHz band

The Chairman went on to detail the current status with regard to the European Commission Decision on BWA in the band 3.4 – 3.8 GHz. It was pointed out that as this was an EC Decision it would be binding on EU Member States and it would not be necessary to transpose it into Irish law. It may however be necessary to change the FWALA Regulations no. 79 of 2003 to reflect the ability to provide mobile services.

Action: Chairman to get legal view on the requirement to amend the FWALA Regulations 79 of 2003 to permit mobility in the context of the EU Decision.

4. FWALA Compliance

Tom Boyce, Licence Compliance Manager gave a presentation to the Forum on how ComReg deals with incidences of interference that are reported to the office. He went on to detail the obligations that apply to a licensee in regard to meeting the terms of their licence.

Last Mile asked whether ComReg investigated complaints of operators in the licence exempt bands exceeding the defined power levels. Tom Boyce stated that such complaints were acted upon by ComReg but as they were in the licence exempt bands they were treated as low priority issues and would only be addressed after all other complaints from licensed operators had been addressed.

5. Review of FWALA Forum Terms of Reference

The FWALA Forum document FWAFor(04)02Rev 2 were reviewed and no changes were made.

6. Any other Business (AOB)

None

7. Date for next Forum Meeting

The next meeting of the FWALA Forum will take place on **3 April 2008** at a location and time to be confirmed.

**Tara Kavanagh
Chairman
FWALA Forum
4 December 2007**

Annex: 8 Meeting 8, April 17 2008



FWALA Operator's Forum
8th Meeting
ComReg Offices
10.00am, 17 April 2008

Agenda

1. Introduction
 - a. Approval of Agenda (FWAFor(08)01)
 - b. Approval of Minutes of 7th meeting/Review of Action Points

2. Latest FWALA Developments
 - a. Comparative Evaluation process Comreg document 08/25
 - b. Update on the EC Decision on 3.5 GHz FWAFor(08)03ECDec

3. Cross Border Co-ordination
 - a. Memorandum of Understanding with UK for the 3.5 GHz band FWAFor(08)02MoU

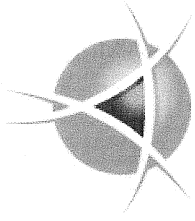
- Coffee Break -

4. FWALA Licence Compliance

5. Broadband Speeds
 - a. ASAI Note to Broadband providers FWAFor(08)04ASAI

6. Date for next Forum Meeting
 - a. Proposed date 25 September 2008

7. AOB



Commission for
Communications Regulation

Ofcom
OFFICE OF COMMUNICATIONS

**MEMORANDUM OF UNDERSTANDING ON
FREQUENCY COORDINATION BETWEEN
THE REPUBLIC OF IRELAND
AND
THE UNITED KINGDOM
FOR WIRELESS ACCESS SERVICES
IN THE FREQUENCY BAND
3400 TO 3800 MHz**

1. INTRODUCTION

- 1.1. This memorandum describes the procedures for the coordination of Wireless Access¹ (WA) radio services between the Republic of Ireland (ROI) and the United Kingdom (UK) in the frequency band 3400 to 3800 MHz.
- 1.2. Services other than Wireless Access are not covered by this agreement.
- 1.3. Ofcom is the Administration of the United Kingdom responsible for all relations with Ireland concerning this MoU.
- 1.4. The Commission for Communications Regulation is the Administration of the ROI responsible for all relations with the UK concerning this MoU.
- 1.5. Accordingly, the Administrations of the UK and the ROI have agreed the following co-ordination procedures.
- 1.6. The co-ordination procedure, is based on the principle of equitable access to the spectrum resource

2. CRITERIA FOR COORDINATION

- 2.1. A station may be established without co-ordination, provided that the predicted power spectral density (PSD) produced by the station, at a height of 10m above ground at 15km inside the border or coast line of the neighbouring country does not exceed 24 dB μ V/m in a bandwidth of 1MHz (equivalent to an aperture power of -122 dBW/MHz/m²).
- 2.2. In the case of time division duplex technology the interference power shall be the power, during the active part of the signal, in the stated bandwidth.

3. PREDICTION OF PROPAGATION

The field prediction method shall be according to the current version of Recommendation ITU-R P.452² which shall be applied as follows:

- 10% of the time

Taking account of:

- Height of the receiver antenna set at 10 m above ground.
- Terrain profile for the base station in all main directions
- Type of terrain (e.g. land, sea, mixed path)
- Effective radiated field strength
- Antenna tilt and azimuth

¹ Recommendation ITU R F 1399 Vocabulary of terms for Wireless Access

² Recommendation ITU-R P.452, Prediction procedures for the evaluation of microwave interference, between stations on the surface of the earth at frequencies above about 0.7 GHz.

4. CO-ORDINATION PROCEDURE

- 4.1. The Administration of the ROI and the UK are committed to ensuring that the licensees covered by this Memorandum of Understanding, respect the limits for establishment of base stations without co-ordination, given in 2 above. However, there might be an occasional need to establish stations such that the PSD will exceed the limits given in 2 above. In such cases, each administration may seek co-ordination according to paragraph 4.
- 4.2. Receive stations in a neighbour country shall not claim protection from interference from transmit stations that operate such that the signal level in a neighbour country is less than the trigger level described in this MoU or are coordinated according to this MoU.

5. EXCHANGE OF INFORMATION

- 5.1. An MoU between the administrations of the ROI and the UK, which enables co-ordination between operators, subject to agreement of the Administrations, was signed on the 22 November 2000.³ This principle shall be extended to operators of systems for the frequency bands identified in this MOU.
- 5.2. In the event of interference the affected parties shall exchange information with a view to resolving the dispute by mutual agreement. A report of the interference and the details of the information exchanged shall be sent to both administrations. The Administrations of Ireland and the United Kingdom agree to facilitate the exchange of information between operators.
- 5.3. An Administration wishing to bring a station into service or wishing to modify the characteristics of a station, such that the signal exceeds a coordination threshold given in paragraph 2, must submit a request for co-ordination with the other Administration by way of notice.
- 5.4. Exchanges of information for coordination/notification purposes shall be in the format set out in the HCM agreement Appendix 2A (revised at Vilnius 2005).
- 5.5. The affected Administration shall evaluate the request for co-ordination and shall within 30 days notify the result of the evaluation to the Administration requesting co-ordination.
- 5.6. If in the course of the co-ordination procedure the affected Administration requires additional information, the Administration seeking co-ordination shall provide such information upon request.
- 5.7. An Administration not having responded within 30 days following communication of the reminder shall be deemed to have given its consent and the station may be brought into use with the characteristics given in the request for co-ordination.

³ Agreement between the administrations of United Kingdom/Ireland concerning the approval of planning arrangements between operators of mobile radio communication networks 22 November 2000

6. REVIEW ARRANGEMENTS

The limits and prediction methods defined in this Memorandum of Understanding may be reviewed in the light of experience of operation of networks in both countries and future prediction developments.

7. TERMINATION OF THE MEMORANDUM OF UNDERSTANDING

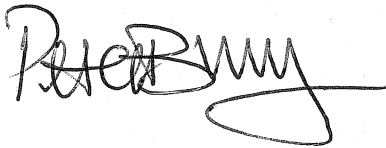
Either Administration may withdraw from this Memorandum of Understanding subject to 6 months notice.

8. DATE OF ENTRY INTO FORCE

This Memorandum of Understanding shall enter into force on 1 April 2008.

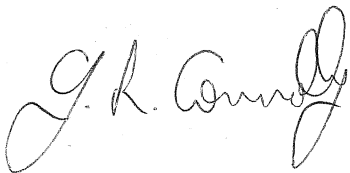
Signed on 31 March 2008.

For the UNITED KINGDOM administration

A handwritten signature in black ink, appearing to read 'P. Bury', with a stylized, flowing script.

P BURY

For the administration of the REPUBLIC OF IRELAND

A handwritten signature in black ink, appearing to read 'J. Connolly', with a stylized, flowing script.

J. CONNOLLY



EUROPEAN COMMISSION
Information Society and Media Directorate-General
Electronic Communications Policy
Radio Spectrum Policy

Brussels, 14 March 2008
DG INFSO/B4

RSCOM07-90 Final

PUBLIC DOCUMENT

RADIO SPECTRUM COMMITTEE

Working Document

Subject: Final Draft Commission Decision on the harmonisation of the 3400-3800 MHz frequency band for terrestrial systems capable of providing electronic communications services in the Community

This is a Committee working document which does not necessarily reflect the official position of the Commission. No inferences should be drawn from this document as to the precise form or content of future measures to be submitted by the Commission. The Commission accepts no responsibility or liability whatsoever with regard to any information or data referred to in this document.



Draft

COMMISSION DECISION

of [...]

on the harmonisation of the 3400-3800 MHz frequency band for terrestrial systems capable of providing electronic communications services in the Community

(Text with EEA relevance)

THE COMMISSION OF THE EUROPEAN COMMUNITIES,

Having regard to the Treaty establishing the European Community,

Having regard to Decision No 676/2002/EC of the European Parliament and of the Council of 7 March 2002 on a regulatory framework for radio spectrum policy in the European Community (Radio Spectrum Decision)¹, and in particular Article 4(3) thereof,

Whereas:

- (1) The Commission has supported a more flexible use of spectrum in its Communication on "Rapid access to spectrum for wireless electronic communications services through more flexibility"², which *inter alia* addresses the 3400-3800 MHz band. Technological neutrality and service neutrality have been underlined by Member States in the Radio Spectrum Policy Group (RSPG) opinion on Wireless Access Policy for Electronic Communications Services (WAPECS) of 23 November 2005 as important policy goals to achieve a more flexible use of spectrum. Moreover, according to this opinion, these policy goals should not be introduced abruptly, but in a gradual manner to avoid disruption of the market.
- (2) The designation of the 3400-3800 MHz band for fixed, nomadic and mobile applications is an important element addressing the convergence of the mobile, fixed and broadcasting sectors and reflecting technical innovation. The services provided in this frequency band should mainly target end-user access to broadband communications.
- (3) It is expected that the wireless broadband electronic communications services for which the 3400–3800 MHz band is to be designated will to a large extent be pan-European in the sense that users of such electronic communications service in one Member State could also gain access to equivalent services in any other Member State.

¹ OJ L 108, 24.4.2002, p. 1.

² COM(2007)50.

- (4) Pursuant to Article 4(2) of Decision 676/2002/EC, the Commission gave a mandate dated 4 January 2006 to the European Conference of Postal and Telecommunications Administrations (hereinafter the “CEPT”) to identify the conditions relating to the provision of harmonised radio frequency bands in the EU for Broadband Wireless Access (BWA) applications.
- (5) In response to that Mandate, the CEPT issued a report (CEPT Report 15) on BWA, which concludes that the deployment of fixed, nomadic and mobile networks is technically feasible within the 3400-3800 MHz frequency band under the technical conditions described in the Electronic Communications Committee's Decision ECC/DEC/(07)02 and Recommendation ECC/REC/(04)05.
- (6) The results of the Mandate to the CEPT should be made applicable in the Community and implemented by the Member States without delay given the market demand for the introduction of terrestrial electronic communication services providing broadband access in these bands. Taking into account the differences in current use and in market demand for the 3400-3600 MHz and 3600-3800 MHz sub-bands at national level a different deadline should be established for the designation and availability of the two sub-bands.
- (7) The designation and making available of the 3400-3800 MHz band in accordance with the results of the Mandate on BWA recognises the fact that there are other existing applications within these bands and does not preclude the future use of these bands by other systems and services to which these bands are allocated in accordance with the ITU Radio Regulations (designation on a non-exclusive basis). Appropriate sharing criteria for coexistence with other systems and services in the same and adjacent bands have been developed in ECC Report 100. This report confirms, *inter alia*, that sharing with satellite services is often feasible considering the extent of their deployment in Europe, geographical separation requirements and case-by-case evaluation of actual terrain topography.
- (8) Block Edge Masks (BEM) are technical parameters that apply to the entire block of spectrum of a specific user, irrespective of the number of channels occupied by the user's chosen technology. These masks are intended to form part of the authorisation regime for spectrum usage. They cover both emissions within the block of spectrum (i.e. in-block power) as well as emissions outside the block (i.e. out-of-block emission). They are regulatory requirements aimed at managing the risk of harmful interference between neighbouring networks and are without prejudice to limits set in equipment standards under Directive 1999/5/EC of the European Parliament and of the Council of 9 March 1999 *on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity (the R&TTE Directive)*³.
- (9) Harmonisation of technical conditions for the availability and efficient use of spectrum does not cover assignment, licensing procedures and timing, nor the decision whether to use competitive selection procedures for the assignment of radio frequencies, which will be organised by Member States in line with Community law.
- (10) Differences in the national legacy situations could result in competitive distortions. The existing regulatory framework gives Member States the tools to deal with these

³ OJ L 91, 7.4.1999, p. 10.

problems in a proportionate, non-discriminatory and objective manner, subject to Community law including Directive 2002/20/EC of the European Parliament and of the Council of 7 March 2002 on the authorisation of electronic communications networks and services (Authorisation Directive)⁴ and Directive 2002/21/EC of the European Parliament and of the Council of 7 March 2002 on a common regulatory framework for electronic communications networks and services (Framework Directive)⁵.

- (11) The use of the 3400-3800 MHz band by other existing applications in third countries can limit the introduction and use of this band by electronic communications networks in several Member States. Information on such limitations should be notified to the Commission pursuant to Articles 7 and 6(2) of Decision 676/2002/EC and published in accordance with Article 5 of Decision 676/2002/EC.
- (12) In order to ensure effective use of the 3400-3800 MHz band also in the longer term, administrations should continue with studies that may increase efficiency and innovative use, such as meshed network architectures. Such studies should be taken into account when considering a review of this Decision.
- (13) The measures provided for in this Decision are in accordance with the opinion of the Radio Spectrum Committee.

HAS ADOPTED THIS DECISION:

Article 1

This Decision aims at harmonising, without prejudice to the protection and continued operation of other existing use in this band, the conditions for the availability and efficient use of the 3400-3800 MHz band for terrestrial systems capable of providing electronic communications services.

Article 2

- (1) No later than six months after entry into force of this Decision Member States shall designate and make available, on a non-exclusive basis, the 3400-3600 MHz band for terrestrial electronic communications networks, in compliance with the parameters set out in the Annex to this Decision.
- (2) By 1 January 2012 Member States shall designate and subsequently make available, on a non-exclusive basis, the 3600-3800 MHz band for terrestrial electronic communications networks, in compliance with the parameters set out in the Annex to this Decision.
- (3) Member States shall ensure that networks referred to in paragraphs (1) and (2) give appropriate protection to systems in adjacent bands.

⁴ OJ L 108, 24.4.2002, p. 21.

⁵ OJ L 108, 24.4.2002, p. 33.

- (4) Member States shall not be bound to implement the obligations under this Decision in geographical areas where coordination with third countries requires a deviation from the parameters in the Annex to this Decision.
Member States shall make all practicable efforts to solve such deviations, which they shall notify to the Commission, including the affected geographical areas, and publish the relevant information pursuant to Decision 676/2002/EC.

Article 3

Member States shall allow the use of the 3400-3800 MHz band in accordance with Article 2 for fixed, nomadic and mobile electronic communications networks.

Article 4

Member States shall keep the use of the 3400-3800 MHz band under scrutiny and report their findings to the Commission to allow regular and timely review of the Decision.

Article 5

This Decision is addressed to the Member States.

Done at Brussels, [...]

For the Commission
Member of the Commission

ANNEX

Parameters referred to in Article 2

The following technical parameters called Block Edge Mask (BEM) are an essential component of conditions necessary to ensure co-existence in the absence of bilateral or multilateral agreements between neighbouring networks. Less stringent technical parameters, if agreed among the operators of such networks, can also be used. Equipment operating in this band may also make use of e.i.r.p.⁶ limits other than those set out below provided that appropriate mitigation techniques are applied which comply with Directive 1999/5/EC and which offer at least an equivalent level of protection to that provided by these technical parameters⁷.

A) Limits for in-block emissions:

Station type	Maximum e.i.r.p. spectral density (dBm/MHz) (including tolerances and Automatic Transmitter Power Control (ATPC) range)
Central Station (and Repeater Station down-links)	+ 53 Note 1
Terminal Station outdoor (and Repeater Station up-links)	+ 50
Terminal Station (indoor)	+ 42
Note 1: The Central Station e.i.r.p. spectral density value given in the table is considered suitable for conventional 90 degrees sectorial antennas.	

Table 1: E.i.r.p. spectral density limits for fixed and nomadic deployments between 3400 and 3800 MHz

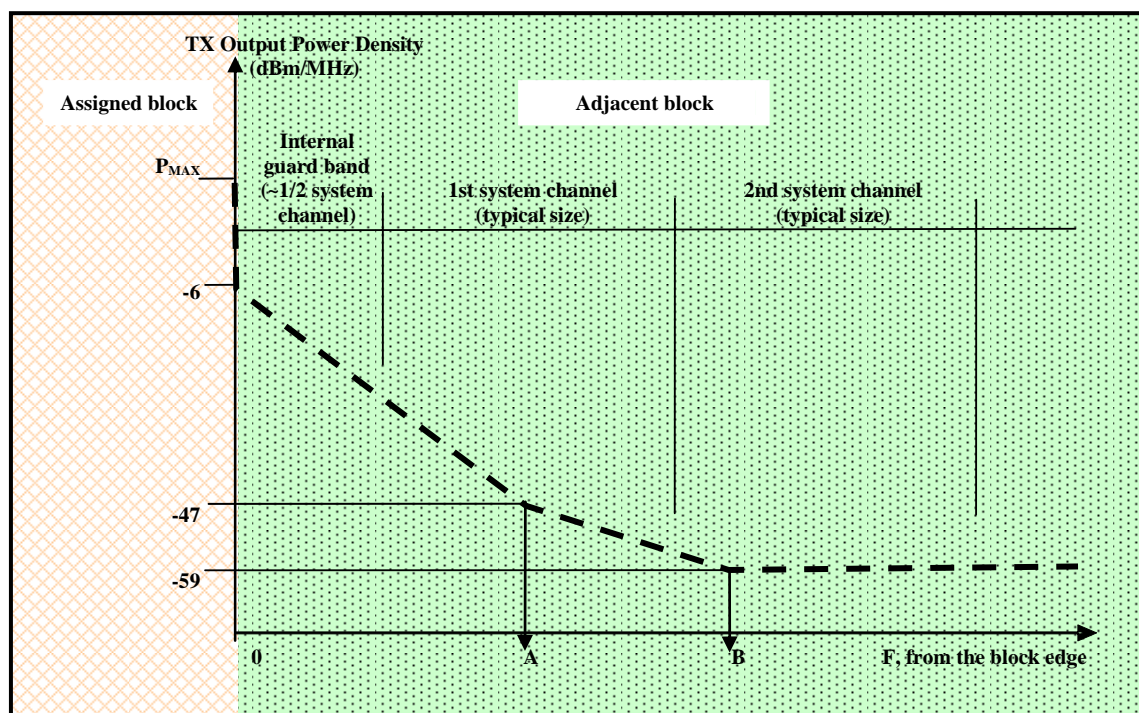
Station type	Maximum e.i.r.p. spectral density (dBm/MHz) (Minimum ATPC range: 15 dB)
Central Station	+ 53 Note 1
Terminal Station	+ 25
Note 1: The Central Station e.i.r.p. spectral density value given in the table is considered suitable for conventional 90 degrees sectorial antennas.	

Table 2: E.i.r.p. spectral density limits for mobile deployments between 3400 and 3800 MHz

⁶ equivalent isotropically radiated power.

⁷ The generic technical conditions applicable to fixed and nomadic networks are described in Harmonised Standards EN 302 326-2 and EN 302 326-3, which also include definitions for a Central Station and a Terminal Station. The term Central Station may be considered equivalent to the term Base Station in the context of mobile cellular networks.

B) Limits for out-of-block emissions (Block Edge Mask for Central Stations):



Frequency offset	Definition (% of the size of the assigned block)
A	20%
B	35%

Note: The percentages given in the “Definition” column refer to the smaller of adjacent blocks, if blocks are of unequal size.

Figure 1: Central Station out-of-block emissions

Frequency offset	Central Station Transmitter Output Power Density Limits (dBm/MHz)
In-band (within assigned block)	See Tables 1 and 2
$\Delta F=0$	-6
$0 < \Delta F < A$	$-6 - 41 \cdot (\Delta F/A)$
A	-47
$A < \Delta F < B$	$-47 - 12 \cdot ((\Delta F - A)/(B - A))$
$\Delta F \geq B$	-59

Table 1: Tabular description of Central Station Block Edge Mask

Advice Note to Broadband Providers

The ASAI has recently received a range of complaints from consumers concerning advertising for broadband services. The Complaints Committee of the Authority have now adjudicated upon a number of these complaints and in addition they requested the Secretariat to revise the existing Advice Note to Broadband Providers in order to provide clarity on the level of information that should be provided in their advertising. In drawing up this Advice Note, the ASAI has drawn on the guidance and advice of the Commission for Communications Regulation (ComReg) and the National Consumer Agency (NCA).

The Code of Standards for Advertising, Promotional and Direct Marketing requires in relation to marketing communications:

- that before offering a marketing communication for publication, advertisers should satisfy themselves that they will be able to provide documentary evidence to substantiate all claims, whether direct or indirect, expressed or implied, that are capable of objective assessment. Relevant evidence should be sent without delay if requested by the Authority and should be adequate to support both detailed claims and the overall impression created by the marketing communication. (2.9)
- that the design and presentation of marketing communications should allow them to be easily and clearly understood. That where footnotes or 'small print' sections are used, they should be of sufficient size and prominence and easily legible; where appropriate they should be linked to the relevant part of the main copy. (2.23)
- that they should not mislead by inaccuracy, ambiguity, exaggeration, omission or otherwise. (2.24)
- that claims such as "up to" and "from" should not exaggerate the value or the range of benefits likely to be achieved in practice by consumers. (2.26)
- that advertisers should be in a position to meet any reasonable demand created by their advertising (2.45).
- that where there is limited availability of some or all of the products advertised, apart from indicating that there may be other terms and conditions which apply, advertisers should not exaggerate the availability of any of those products (2.46).

Availability

In general, advertisers offering broadband services should take care in the design and presentation of their marketing communications so as not to exaggerate the availability of their product. This is of particular importance when national media are used.

If the provision of the broadband service is dependent on such criteria as the quality of individual phone lines and/or their distance from the telephone exchange, then a reference must be included that the service is dependent on survey, compatibility and availability.

Where the provider offers a limited geographical coverage, advertising in national media must include an appropriate reference such as 'service dependent on coverage' or 'availability dependent on coverage'.

If there are material restrictions on access to certain programmes / services, then reference to such restrictions should also be given.

Cont/d ...

Speed of service

Where broadband speeds are described by the maximum speed attainable, they must be described as an 'up to' speed.

Where a reference to speed is included in an advertisement, in order to ensure clarity for consumers, advertisers must state the speed in the busy hour ¹for the particular product² (An example of an acceptable statement is "Busy hour speed is xx"). This statement should be included in the body copy and not in the small print sections of advertising.

It must be clear to consumers that advertised speeds are not achievable in all circumstances. The prominence of the required clarification in the advertisement will be dependent on the normal variance between the advertised top speed and that typically achieved by consumers.

Where a particular broadband speed is being promoted or where superlatives such as 'high speed', 'fast', etc are used, a reference to the variability of speeds should be included. Phrases such as '*Broadband speeds may vary*' are acceptable provided that the busy hour speed is close enough to those advertised so as not to affect the customers' experience in any meaningful way.

Copy Advice

The ASAI operates a copy advice service that is quick, confidential, free and of an advisory nature. We are glad to give advice on any proposed advertisement's compliance with the Code of Standards for Advertising, Promotional and Direct Marketing.

F Goodman,
CHIEF EXECUTIVE.

Issued 5th March 2008

Effective 7th April 2008

¹ The **busy hour** is the hour of heaviest demand averaged throughout the network during what is typically the heaviest day of usage in a week. This should be based on traffic figures over each calendar quarter, or from the date of any improvements affecting service.

² **Particular product:** This refers to each distinct broadband product advertised by the provider.



Commission for
Communications Regulation

'Built For Speed'

Or Wireless Broadband Testing

And

The ASAI Code





'You got a problem, we got a solution'

- **Summer 2007, Complaints Received Re Broadband Speeds**
- **By NCA, ASAI and the ComReg**
- **Commissioned Static Wireless Broadband Speed Tests**
- **First Tranche HSDPA Only, October 2007**
- **Testing Expanded Covering FWA, December 2007**
- **Consistent Results**





'Strategies against architecture'

- **32 Towns and 5 Cities Tested (11.00-21.00Hrs)**
- **Minimum of Two Tests per Locality**
- **One Urban, One Sub-Urban**
- **8MB File Downloaded continuously for 5 Mins**
- **Throughput and Basic RF parameters Measured**
- **No Network Present , Spectrum Scan**
- **Passed to Enforcement**



Network Type	Maximum	Average	Minimum
HSDPA (3.6)	2067kb/s	800kb/s	127kb/s
FWA (1)	918kb/s	546kb/s	273kb/s



'Minimum-Maximum'

- **Large disparity between minimum and maximum speed, as expected but**
- **Large disparity between maximum and average speeds**
- **Consulted with ASAI and NCA**
- **Confirmed that there are companies on the market specialising in broadband testing**





'KISS' or the ASAI Advice Note

- 1. Broadband speeds described by the 'maximum speed attainable, they must be described as an 'up to speed''**
- 2. Reference to speed in advertisement, 'advertisers must state the speed in the busy hour' for the product**
 - 'Busy hour is the hour of heaviest demand averaged throughout the network during what is typically the heaviest day of usage in a week'**
 - Based on traffic figures over each calendar quarter**
- 3. Use of superlatives tempered by 'broadband speeds may vary'**



Commission for
Communications Regulation

8th FWALA Forum
17 April 2008



Spectrum Availability in Channels A and C

- **ComReg has published Information Memorandum 08/25.**
- **Closing date for receipt of applications is April 23 at 5.00 p.m.**
- **Changes to evaluation criteria:**
 - "Speed to Market"
 - "Temporary" FWALA licence.
 - Revised characteristics for the residential and business offerings.
 - Licence holders who had licence revoked in the area cannot reapply.



EC Decision on 3.5 GHz band

- All but one Member State (Luxembourg) were in favour of the Decision.
- Formal adoption of the Decision by the Commission is expected to take place at the end of April.
- Article 1

This Decision aims at harmonising, without prejudice to the protection and continued operation of other existing use in this band, the conditions for the availability and efficient use of the 3400 – 3800 MHz band for terrestrial systems capable of providing electronic communications services.



EC Decision on 3.5 GHz band

Article 2

1. No later than six months after entry into force of this Decision Member States shall designate and make available, on a non-exclusive basis, the 3400 – 3600 MHz band for terrestrial electronic communications networks, in compliance with the parameters set out in the Annex to this Decision.
2. By 1 January 2012 Member states shall designate and subsequently make available, on a non exclusive basis, the 3600 – 3800 MHz band for terrestrial electronic communications networks, in compliance with the parameters set out in the Annex to the Decision.
3. Member States shall ensure that networks referred to in paragraphs (1) and (2) give appropriate protection to systems in adjacent bands.



EC Decision on 3.5 GHz band

(4) Member States shall not be bound to implement the obligations under this Decision in geographical areas where coordination with third countries requires a deviation from the parameters in the Annex to this Decision.

Member States shall make all practicable efforts to solve such deviations, which they shall notify to the Commission, including the affected geographical areas, and publish the relevant information pursuant to Decision 676/2002/EC.

Article 3

Member States shall allow the use of the 3400 – 3800 MHz band in accordance with Article 2 for fixed, nomadic and mobile electronic communications networks.



EC Decision on 3.5 GHz band

Article 4

Member States shall keep the use of the 3400 – 3800 MHz band under scrutiny and report their findings to the Commission to allow regular and timely review of the Decision.

Article 5

This Decision is addressed to the Member States.



Cross Border Co-ordination

- **Criteria for coordination;**
 - A station may be established without co-ordination, provided that the predicted power spectral density produced by the station, at a height of 10m above ground at 15km inside the border or coast line of a neighbouring country does not exceed $24\text{dB}\mu\text{V}/\text{m}$ in a bandwidth of 1MHz (equivalent to an aperture power of $-122\text{dBW}/\text{MHz}/\text{m}^2$)
 - In the case of time division duplex technology the interference power shall be the power, during the active part of the signal, in the stated bandwidth.
- **Propagation Model ITU-R.452 to be applied.**

Source: ComReg

FWAFor08(05)

Date: 17 November 2008

Subject: Minutes of 8th meeting of
FWALA Forum

FWALA Operator's Forum Minutes of 8th Meeting

Attendees:

Name	Organisation
Tara Kavanagh (Chairman)	ComReg
Jim Connolly	ComReg
Patrick Mulvey	ComReg
Tom Boyce	ComReg
Dave Thom	ComReg
Paul Cunane	Westnet
Ruairi Jennings	Irish Broadband
Ian Watson	Irish Broadband
Cormac Haverty	Titan
Charl Tintinger	Digiweb
Conor Twomey	Fastcom
Liam O Kelly	Airspeed
Brendan Martin	Airspeed
John Gibbons	Last Mile Wireless
Mark O Raw	High Speed Data

1. Introduction and Adoption of the Agenda:

The Chairman welcomed all the participants to the 8th FWALA Forum meeting. The Forum adopted the agenda as shown in Annex 1.

1.1 Approval of minutes of 7th meeting

No comments were received on the minutes of the 7th meeting of the forum. The minutes from the 7th meeting were approved.

2. Latest FWALA Developments

2.1 Comparative Evaluation process Comreg document 08/25

ComReg document 08/25 Information Memorandum on the additional spectrum in Channel A and Channel C comparative evaluation was introduced. The Chairman outlined the changes to the comparative evaluation criteria for this award and reminded members that the closing date for applications is April 23.

2.2 Draft European Commission Decision on Broadband Wireless Access in 3.4-3.8 GHz band

Jim Connolly (ComReg) introduced the document FWAFor(08)03ECDEC on the European Commission Decision on the harmonisation of the band 3400 – 3800 MHz band for electronic communications services. He went through the document and the articles in detail and the impact it will have on FWALA operators.

Ruairi Jennings (Irish Broadband) raised the question of how UWB usage will affect services such as FWALA and he referred to concerns expressed by the WiMax Forum on this issue. Jim Connolly stated that studies had been carried out at a CEPT level which indicated that UWB could coexist with services in the 3400 – 3800 MHz band. However as the current number of devices currently using UWB in this band is small it is difficult to gauge the operational impact of UWB on existing services at this stage. Irish Broadband went on to say that given the importance of mobility to FWALA operators that they would like to see the EC Decision implemented in Ireland well within the 6 month timeframe stipulated in the Decision.

3. Cross Border Co-ordination

Document FWAFor(08)02MoU was presented. This document is the agreed Memorandum of Understanding between Ireland and the UK on the criteria for cross-border frequency co-ordination in the 3.5 GHz band.

4. FWALA Licence Compliance

Tom Boyce (ComReg) gave a presentation to the Forum on licence compliance, highlighting the increase in point-to-point interference complaints that the office is currently acting on. He asked Forum members to ensure that they or their contractors ensure that all their point-to-point links are licensed before they are switched on as this has been one of the main causes for the increase in interference complaints .

He went on to highlight ComReg's obligations under the Data Protection Act and asked operators to ensure that they are registered with the Data Protection Commissioner and that they nominate ComReg as a Disclosee. Further details can be obtained from the Data Protection Commissioner's web site at www.dataprotection.ie.

5. Broadband Speeds

Dave Thom (ComReg) gave a presentation to the Forum on the new code of practice issued by the Advertising Standards Authority for Ireland (ASAI) on broadband speeds

(<http://www.asai.ie/documents/ASAI%20ADVICE%20NOTE%20ON%20BROADBAND.pdf>). He detailed the obligations on operators to ensure that they comply with that code of practice. Ruairi Jennings (Irish Broadband) stated that he felt that the consultation was hasty and did not give operators sufficient time to consider the proposals. He is of the view that the approach taken was heavy handed and that the code of practice may need revisiting in the future so that it does not inhibit broadband providers from advertising speeds.

Dave Thom stated that there was nothing to stop a broadband provider from advertising speeds as long as they were able to stand over it.

6. Any other Business (AOB)

Tara Kavanagh stated that the matter of a Hi/Lo database for 26GHz FWALA operators was raised during offline discussions. She stated that ComReg recognised the need for a FWALA Hi/Lo database in the 26 GHz band to be in place in advance of completion of the current 26GHz national block licences award process. She stated

that when ComReg had considered the matter in detail it will write to all 26 GHz FWALA operators on the requirement to register their base stations to mitigate against the potential for interference into the future.

Mark O Raw (High Speed Data) stated that it was unacceptable that ComReg had yet to release the additional FWALA channels F, G, H and I almost 1 year after it said it would do so. He stated that ComReg's failure to release the spectrum in conjunction with reserving spectrum for the National Broadband Scheme was not in the interest of competition.

Tara Kavanagh stated that ComReg is aware of the need to release additional spectrum in the 3.5 GHz band for FWALA operators but that there were a number of issues that needed to be considered such as how to facilitate the introduction of mobility in the band and technical matters concerning the use of Channel E. ComReg is of the view that it is of the utmost importance that all matters are considered in detail before the spectrum is released to ensure the best outcome in the long term for operators and users.

7. Date for next Forum Meeting

The next meeting of the FWALA Forum will take place on 25 September 2008 at a location and time to be confirmed.

Tara Kavanagh
Chairman
FWALA Forum
17 April 2008

Annex: 9 Meeting 9, September 25 2008



Commission for
Communications Regulation

**FWALA Operator's Forum
9th Meeting
ComReg Offices
10.00am, 25 September 2008**

Agenda

1. Introduction
 - a. Approval of Agenda (FWAFor(08)06)
 - b. Approval of Minutes of 8th meeting/Review of Action Points

2. Latest FWALA Developments
 - a. Release of Additional FWALA Channels Comreg document 08/72
 - b. Changes to the FWALA mapping process
 - c. Additional 10.5 GHz spectrum
 - d. 26 GHz FWALA registration
 - e. FWALA mobility
 - f. Possible future FWALA channels

3. Date for next Forum Meeting
 - a. Proposed date 19 February 2009

4. AOB



Commission for
Communications Regulation

8th FWALA Forum
25 September 2008



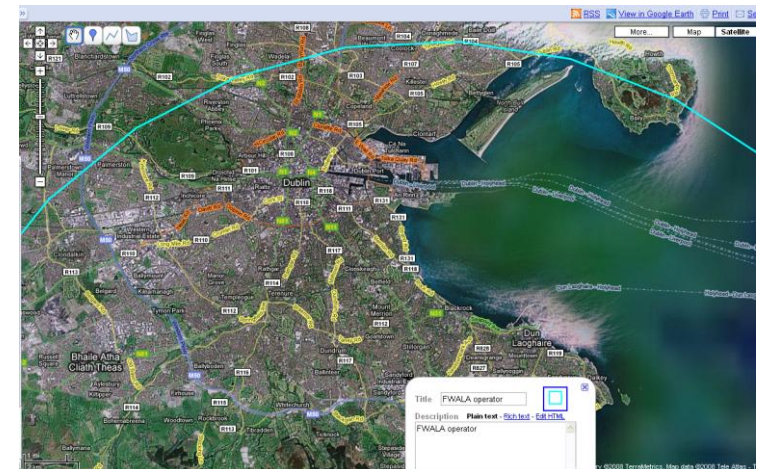
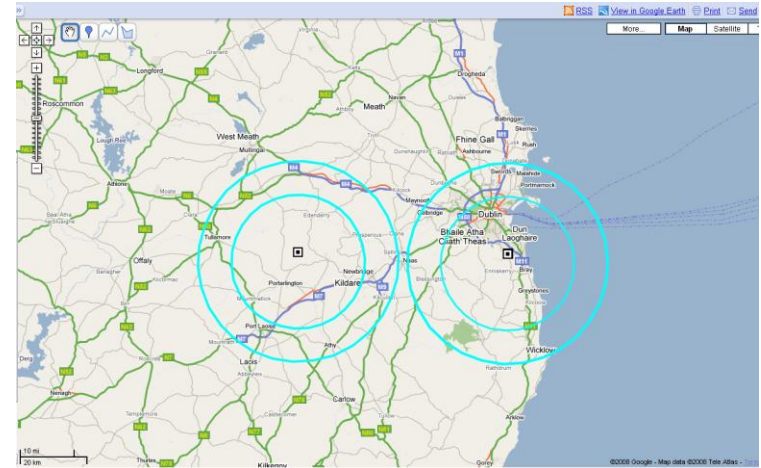
Additional FWALA Channels

- **ComReg has published Information Memorandum 08/72.**
- **ComReg has received 2 written requests for changes to the I.M. which are being considered.**
- **Changes to evaluation criteria:**
 - "Speed to Market"
 - "Temporary" FWALA licence.
 - Revised characteristics for the residential and business offerings.
 - Removal of performance bond limit of €15,000.
- **Maximum of two FWALA licences granted in 3.6 – 3.8 GHz band in any FWALA service area.**
- **Applicants can apply for all five channels but will be granted a maximum of three (including channel E).**
- **Applications for different channels should be done on separate application forms.**



Changes to maps on ComReg website

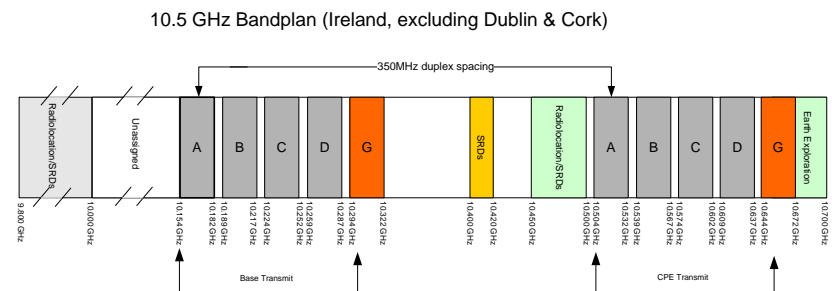
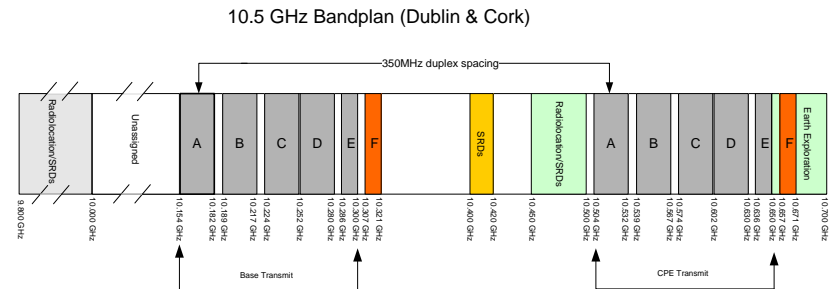
- ComReg are implementing new mapping tool for viewing FWALA maps.
- Google maps is the GUI which will be made available via ComReg site.
- Benefits of doing so include zoom facility and more accurate mapping.
- Maps would be live information, so always up to date.





Additional Spectrum in 10.5 GHz band

- **New FWALA channel being added nationwide.**
- **A paired 14 MHz FDD Channel to be released in Dublin and Cork, Channel F (10.327 – 10.341 GHz and 10.657 – 10.671 GHz).**
- **A paired 28 MHz FDD Channel to be released elsewhere in Ireland, Channel G (10.294 – 10.322 GHz and 10.644 – 10.672 GHz).**
- **ITU Resolution on sharing to be considered by licensees.**





ITU Resolution 751 (WRC – 07)

Use of the frequency band 10.6 - 10.68 GHz

- **ITU Resolution outlines sharing conditions in spectrum 10.6 – 10.68 GHz.**
- **Table 3 in ITU Resolution 751 shows technical conditions which must be adhered to.**

TABLE 3

Stations of point-to-multipoint systems in the fixed service

Parameter	Value
Hub stations (See Note 4)	
Maximum transmitter power at the antenna port	-7 dBW
Maximum off-axis e.i.r.p. above 20° from the horizontal plane	-6 dBW
Maximum off-axis e.i.r.p. above 45° from the horizontal plane	-11 dBW
Maximum off-axis e.i.r.p. at 90° from the horizontal plane	-13 dBW
Customer stations (See Note 4)	
Maximum elevation angle	20°
Maximum transmitter power at the antenna port	-8 dBW
Maximum off-axis e.i.r.p. above 45° from the horizontal plane	-18 dBW (See Note 5)

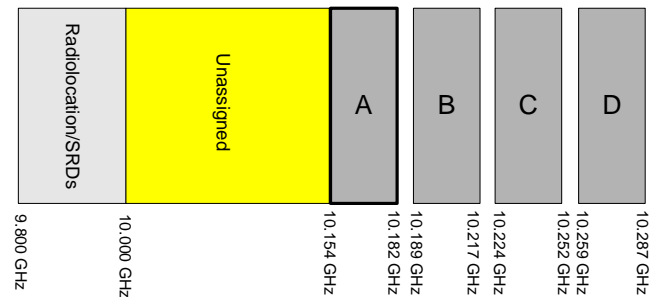
NOTE 4 – Administrations planning point-to-multipoint deployment in the band 10.6-10.68 GHz, paired with another frequency band, are encouraged to only deploy return links (i.e. emissions from customer stations) in the 10.6-10.68 GHz band.

NOTE 5 – In the case of point-to-multipoint systems using ATPC, the maximum transmitter power at the antenna port may be increased by a value corresponding to the ATPC range, up to a maximum of -3 dBW.



Additional Spectrum in 10.5 GHz band

- **Currently 10.000 – 10.154 GHz assigned to fixed services on a primary basis but is unlicensed in Ireland.**
- **ComReg will consult on possible options on how to assign this spectrum.**
- **Important that interested parties express their views to ComReg to help inform the decision making process.**





26 GHz FWALA Registration

- **26 GHz FWALA operators must register base stations with ComReg.**
- **FWALA base stations use the low duplex for base station transmit and high duplex for return path. Therefore all base stations registered are designated low sites.**
- **If there is a high/low transmit conflict, it would not be possible to deploy services from that given site.**
- **Site designation is registered by submitting an xml file with necessary information.**
- **Xml sample files available via licensing section of e-licensing website**

```
<DATA xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation="ComRegStationRegistration.xsd">
  <STATION>
    <IDENTIFIER>MyRef1</IDENTIFIER>
    <LICENCE_REF>Fw1034/2</LICENCE_REF>
    <TX_FREQUENCY>24000</TX_FREQUENCY>
    <RX_FREQUENCY>25000</RX_FREQUENCY>
    <FREQ_UNITS>MHZ</FREQ_UNITS>
    <CHANNEL_WIDTH>28</CHANNEL_WIDTH>
    <WIDTH_UNITS>MHZ</WIDTH_UNITS>
    <SITE_NAME>Cork</SITE_NAME>
    <SITE_TYPE>BS</SITE_TYPE>
    <COORD_TYPE>NIGR</COORD_TYPE>
    <COORD_X>165000</COORD_X>
    <COORD_Y>070000</COORD_Y>
    <DESIGNATION>L</DESIGNATION>
  </STATION>
</DATA>
```

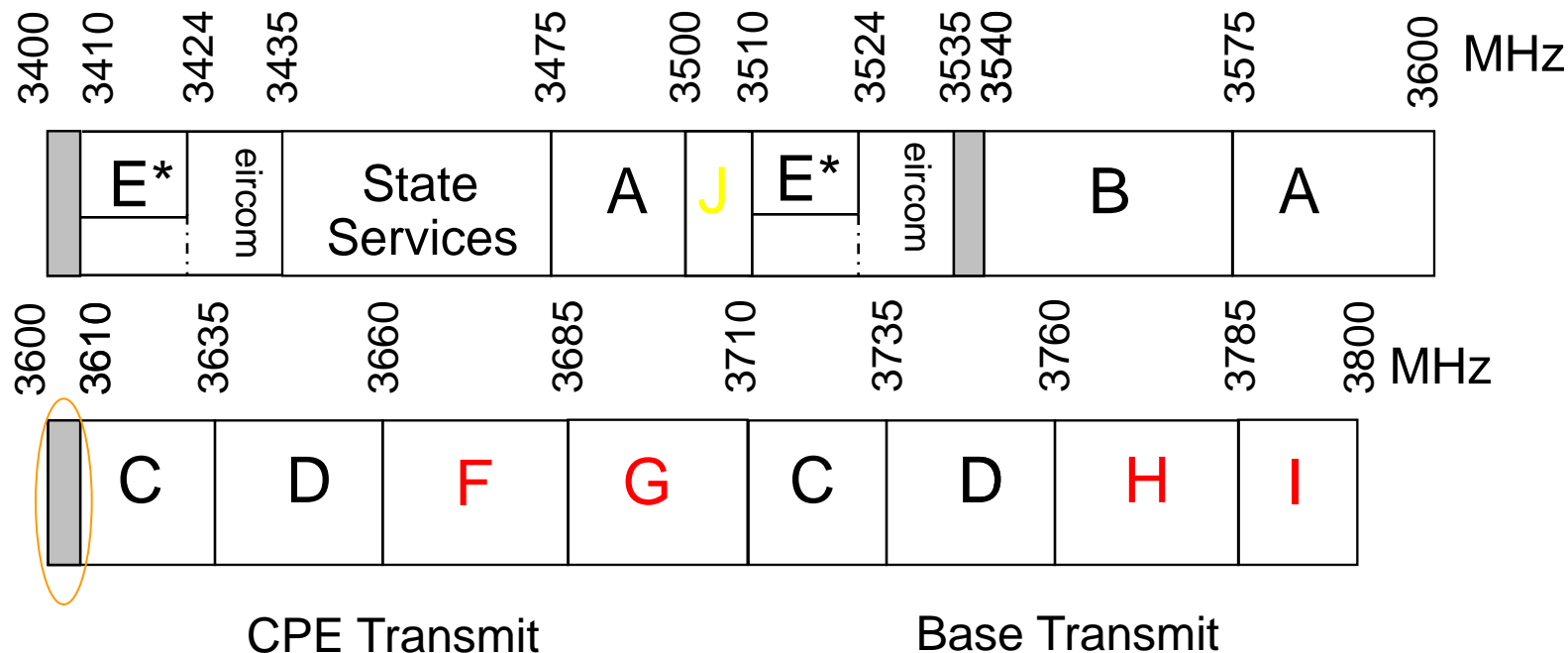


FWALA Mobility

- Currently drafting a consultation document on the implementation of the Commission Decision of 21 May 2008 on the harmonisation of the 3 400 – 3800 MHz frequency band for terrestrial systems capable of providing electronic communications services in the Community.
- Intend to draft new Regulations to permit mobility in the entire band.
- Compliance with the Block Edge Mask will be mandatory on all FWALA licensees.



Possible Future FWALA Channels



* Limited Availability

- ComReg looking at releasing 10MHz at 3600 – 3610 MHz for FWALA.
- Should Channel J not be required by NBS winner Comreg will make it available for FWALA licensing in a timely manner.

Source: ComReg

FWAFor08(07)

Date: 25 September 2008

**Subject: Minutes of 9th meeting of
FWALA Forum**

**FWALA Operator's Forum
Minutes of 9th Meeting
25 September 2008**

Attendees:

Name	Organisation
Tara Kavanagh (Chairman)	ComReg
Jim Connolly	ComReg
Patrick Mulvey	ComReg
Niall Kline	Irish Broadband
Colm Piercy	Digiweb
Alan Mc Fadden	Digiweb
Liam O Kelly	Airspeed
Peter Hendrick	Airspeed
Mark O Raw	High Speed Data

1. Introduction and Adoption of the Agenda:

The Chairman welcomed all the participants to the 9th FWALA Forum meeting. The Forum adopted the agenda as shown in Annex 1.

1.1 Approval of minutes of 8th meeting

No comments were received on the minutes of the 7th meeting of the forum. The minutes from the 7th meeting were approved.

2. Latest FWALA Developments

2.1 Release of Additional FWALA Channels, ComReg document 08/72

Tara Kavanagh (ComReg) gave a short presentation on the publication of ComReg document 08/72. She stated that ComReg had received two written requests for changes to the Information Memorandum which were being considered by the Commissioners. She stated that she would keep all FWALA Forum member informed of any changes to the Information Memorandum. Colm Piercy (Digiweb) asked why ComReg has not considered allowing FDD within the 3.6 – 3.8 GHz part of the band. ComReg stated that this was one of the things currently under consideration by the Commissioners and could not comment in detail as no decision had been made. Colm Piercy then asked if ComReg would consider reviewing the term “meaningful FWALA service” as it is very subjective and open to interpretation. Liam O Kelly (Airspeed) supported the Digiweb proposal and stated that the term as it currently stands is a barrier to raising capital and that ComReg needs to make clear what is

means by “meaningful FWALA service”. Mark O Raw (High Speed Data) stated that ComReg has not gone far enough in making the term clear. ComReg stated that there was a need to ensure that spectrum was not being hoarded and that just installing a base station was not, in ComReg’s view, providing service. The insertion of the term “meaningful service” was meant to provide clarity to operators as to what ComReg would take into consideration when conducting a licence compliance audit. ComReg also stated that a review of the FWALA licensing scheme was planned for 2010 and that stations established under the Doc 08/72 process would only come on stream during 2009, with the result that if practical problems materialised with the term then it could be amended during that review. Following considerable discussion on the matter ComReg said that it would look again at the term but that it had no intention of unduly delaying the licensing of the additional spectrum.

Action: ComReg to look at term “meaningful FWALA service” for any revision of Information Memorandum 08/72.

Mark O Raw (High Speed Data) expressed concern about the removal of the upper limit of the performance bond as this could discriminate against smaller operators from winning spectrum in highly sought after areas. ComReg stated that the removal of the upper limit of €15,000 on the performance bond was done to reflect the differing value of licences in urban versus rural areas. ComReg had considered auctioning the additional spectrum as a way of determining the true value of the spectrum but that would have involved a lengthy process. It was ComReg’s view that there was a need to strike a balance between the demand for the release of the spectrum to interested parties and the need to reflect the value of the spectrum in different areas. As such ComReg was of the view that removal of the upper limit on the performance bond was the simplest approach to take for this award process.

Colm Piercy (Digiweb) asked if ComReg would make a change in the Information Memorandum 08/72 to allow for bonds from bonding agency. ComReg agreed to do this.

Action: ComReg to update Information Memorandum 08/72 to include the term “bonding Agency” in the text.

2.2 Changes to the FWALA mapping process

Patrick Mulvey (ComReg) presented the proposed changes to the FWALA mapping on the ComReg website. ComReg proposes to update all the maps using Google maps and expects the update to go live by early 2009. The Forum members welcomed the proposed changes to the mapping process.

2.3 10.5 GHz additional Spectrum

Patrick Mulvey presented an outline of ComReg’s proposals to make available an additional FWALA channel in the 10.5 GHz band. He highlighted the need to comply with an ITU Resolution to protect passive satellite systems.

He also outlined ComReg’s proposal to release 154 MHz of spectrum in the 10.0 - 10.154 GHz part of the band. He stated that ComReg has no definite plans for the spectrum at this stage and urged interested parties to input their views to ComReg during the consultation phase to help inform the decision making process.

2.4 26 GHz FWALA Registration

Patrick Mulvey gave an overview of the 26 GHz Hi/Lo Registration process that is now live on the ComReg website. Peter Hendrick (Airspeed) asked if ComReg would consider putting the Hi/Lo database in the same Google maps format as the FWALA maps. ComReg stated that they would look at the possibility of doing this.

Action: ComReg to look at possibility of putting the Hi/Lo Database onto Google maps.

2.5 FWALA Mobility

Tara Kavanagh presented ComReg's proposal for the implementation of the European Commission (EC) Decision on the 3.4 – 3.6 GHz band. She stated that ComReg proposes to implement the Decision in the entire 3.4 – 3.8 GHz band at the one time and that it will endeavour to meet the EC deadline of November 2008 for the implementation. She went on to say that ComReg was mindful that operators may have concerns on the potential for interference between operators who deploy mobility and those that don't. She asked operators to provide ComReg with any comments or concerns that they may have in this regard by October 10th 2008.

Action: FWALA Forum member to provide their comments/concerns with regard to the potential for interference between operators using mobility and those that do not to ComReg by close of business on October 10 2008.

2.6 Possible Future FWALA Channels

Tara Kavanagh presented ComReg's proposal for the release of additional channels in the 3.4 – 3.8 GHz band. She stated that ComReg is considering making the 10 MHz of spectrum from 3600 – 3610 MHz available in the near future. In addition as the winner of the National Broadband Scheme (NBS) should be determined by the end of October there will be some clarity over the status of Channel J which ComReg will release it as FWALA spectrum if it is not required for the NBS.

3. Date for next Forum Meeting

The next meeting of the FWALA Forum will take place on 19 February 2009 in the ComReg offices

**Tara Kavanagh
Chairman
FWALA Forum
25 September 2008**