



Commission for
Communications Regulation

Response to Consultation

Utilisation of the 71-76 GHz and 81-86 GHz Spectrum Bands

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Contents

1	Executive Summary	2
2	Introduction	3
2.1	COMREG'S STRATEGY FOR SPECTRUM	3
2.2	COMREG'S 71-76 GHz AND 81-86 GHz CONSULTATION	3
2.3	LIST OF RESPONDENTS.....	4
3	Consultation Issue.....	5
3.1	COMREG'S CONSULTATION PROPOSAL	5
3.2	VIEWS OF RESPONDENTS	6
3.3	COMREG POSITION.....	7
4	80 GHz Application Process	10
	Appendix A: CEPT Recommendation ECC/REC/(05)07 channel arrangements	11

1 Executive Summary

This Document details ComReg's response to consultation document 07/85, 'Utilisation of the 71-76 GHz and 81-86 GHz Spectrum Bands', published on 25th October 2007.

In the consultation, ComReg put forward a proposal which would employ these bands for high capacity fixed point to point radio link deployment. It was proposed that radio links deployed within these bands would be licensed under the current licensing scheme for point to point links above 1 GHz, with technical conditions in relation to radio frequency channel arrangements, equipment and antenna specifications conforming to those set out in the applicable international recommendations.

ComReg received 12 responses to the consultation; this paper provides a summary of these responses and ComReg's position with regard to spectrum utilisation within these bands. ComReg would like to thank all respondents for their valued input.

All 12 respondents were supportive of ComReg's proposal to open this spectrum for commercial applications. Included in the responses were suggestions to implement an alternative licensing structure, offer greater band plan flexibility and to adopt a technology neutral approach for the bands.

After careful consideration of all responses received, ComReg has made the following decision for these bands:

1. Open the 71-76 GHz and 81-86 GHz spectrum bands for high capacity fixed point to point radio link usage in Ireland and monitor developments to assess whether this band should be opened for other applications in the future;
2. Licence radio links in these bands under the existing Radio Link Licence Regulations (S.I. No. 319 of 1992) and existing licensing process;
3. Fully implement all channel arrangements as set out in CEPT Recommendation ECC/REC/(05)07;
4. All radio equipment used to provide radio link services must comply with the Radio and Telecommunications Terminal Equipment Directive 1999/5/EC (the R&TTE Directive) which was enacted into Irish law on 5 June 2001 by Statutory Instrument 240 of 2001;
5. The antenna and radio equipment used in these bands must adhere to technical requirements as set out in ETSI document TS 102 524.

ComReg is mindful of its responsibility to ensure spectrum efficiency, and believes that opening these bands for high density fixed point to point link applications will capitalise on the bands' potential. Moreover, utilising these bands for radio links could prove to be a viable alternative to optical fibre links, particularly if speed and ease of installation is a key factor in link deployment. Such use could potentially facilitate a swift and efficient rollout of broadband services to areas where optical fibre cables are not available or may not be cost effective.

2 Introduction

2.1 ComReg's Strategy for Spectrum

The Commission for Communications Regulation (ComReg) is responsible for the efficient management and use of the radio spectrum, one of Ireland's key natural resources. To this end, ComReg adopts a strategic approach in its management, enabling the efficient use of the spectrum resource through appropriate licensing regimes while minimising interference and unnecessary regulatory intervention. A key aspect of the strategy is to continuously review the use of spectrum to ensure that its potential benefits, both economic and social, are being maximised.

2.2 ComReg's 71-76 GHz and 81-86 GHz consultation

This document sets out ComReg's response to consultation on the 'Utilisation of the 71-76 GHz and 81-86 GHz Spectrum Bands'¹, which was issued in October. The consultation document proposed that these bands be made available for very high capacity fixed point to point radio links.

Currently the 71-76 GHz and 81-86 GHz bands are not allocated or used by any radio frequency service in Ireland and evidence available to ComReg suggested that there was very little demand for any other radio usage, apart from radio links.

The consultation document also highlighted that in comparison to other radio link frequency bands open in Ireland², these bands have a bandwidth availability of up to 2 x 4.75 GHz³. This exceptionally wide bandwidth availability allows radio link equipment deployments within these bands to carry very high transmission capacities. Such radio links could prove to be a viable alternative to optical fibre links, particularly if speed and ease of installation is a key factor in link deployment.

Consequently, use of these bands for high capacity fixed links could potentially facilitate a swift and efficient rollout of broadband services to areas where optical fibre cables are not available or may not be cost effective.

The consultation sought the views of interested parties on the proposed utilisation of the 71-76 GHz and 81-86 GHz bands, and also to further develop ComReg's understanding of the needs of network and service providers in order to optimise the availability of spectrum within these bands. Summaries of the responses to the consultation are presented in this paper, together with ComReg's consideration of

¹ See ComReg document 07/85 at www.comreg.ie.

² See ComReg Document 98/15R5 for further details
<http://www.comreg.ie/fileupload/publications/ComReg9814R5.pdf>

³.The next highest bandwidth availability is 2 x 100 MHz in the 58 GHz band and 2 x 55 MHz in the 18 GHz band.

those responses and how ComReg now intends to proceed with the utilisation of these bands.

2.3 List of Respondents

There were 12 responses received in total:

- AJIS LLC
- Christophe Bernigaud
- John Wood
- LM Ericsson Ireland Ltd.
- O2 Communications (Ireland) Ltd.
- Peter Lawless
- Rayawave Inc.
- Rory Stones
- Thomas Edwards
- Vodafone Ireland Ltd.
- WiFi Projects Ltd. (trading as Wireless Projects)
- YYC (Enterprises) Ltd.

ComReg would like to thank all of the respondents for the time and effort taken in making their responses, and for the valuable views and information provided. All responses received by ComReg, except for annexes marked confidential, will be made available on the ComReg website⁴.

⁴ www.comreg.ie

3 Consultation Issue

3.1 ComReg's Consultation Proposal

The consultation paper proposed that the 71-76 GHz and 81-86 GHz bands be utilised for the deployment of high capacity fixed point to point link services.

Specifically, ComReg proposed that:

1. The 71-76 GHz and 81-86 GHz spectrum bands are to be allocated to high capacity fixed point to point radio link usage in Ireland;
2. Radio links licensed in these bands would be licensed under the existing Radio Link Licence Regulations (S.I. No. 319 of 1992) and based on the existing radio link licensing scheme for point to point links above 1 GHz⁵;
3. The frequency channel arrangements for radio links in these bands would be based upon CEPT Recommendation ECC/REC/(05)07, in a duplex FDD arrangement, with a duplex separation of 10 GHz, as described in Appendix A to the consultation document;
4. In common with other licensed radio services, all radio equipment used to provide radio link services must comply with the Radio and Telecommunications Terminal Equipment Directive 1999/5/EC (the R&TTE Directive) which was enacted into Irish law on 5 June 2001 by Statutory Instrument 240 of 2001. Harmonised standards under the R&TTE Directive, published by the European Telecommunications Standards Institute (ETSI) and CENELEC, can be used to demonstrate compliance to the essential requirements of the R&TTE Directive.⁶;
5. The antenna and radio equipment used in these bands must adhere to technical requirements as set out in ETSI document TS 102 524, as described in Appendix B to this document.

In the consultation, the following question was posed:

Do you agree with ComReg's proposed utilisation of the 71-76 GHz and 81-86 GHz bands for fixed point to point radio links? If you do not agree with all or any part of this proposal, please provide reasons for your answer.

⁵ See ComReg Document 98/15R5
<http://www.comreg.ie/fileupload/publications/ComReg9814R5.pdf>

⁶ A list of the harmonised standards under the R&TTE Directive is maintained at
<http://europa.eu.int/comm/enterprise/newapproach/standardization/harmstds/reflist/radiotte.html>

3.2 Views of Respondents

All respondents support ComReg in opening the 71-76 GHz and 81-86 GHz band for commercial use.

Ten respondents supported ComReg's proposal to open the 71-76 GHz and 81-86 GHz bands for high capacity fixed point to point link applications. The remaining two respondents, while favouring the opening of the bands, did not agree with opening the bands exclusively for point to point applications, and favoured a technology neutral approach which would allow the market to decide which technology is the most appropriate for use within these bands.

In relation to specific items addressed in ComReg's proposal, the following viewpoints were expressed:

- Three respondents favoured a 'light licensing' approach in preference to ComReg's proposal to license prospective links under the existing Radio Link Licence Regulations (S.I. No. 319 of 1992), and based upon the existing radio link licensing scheme for point to point links above 1 GHz.
- One respondent believed that ComReg should consider making some of the spectrum licence exempt or available using a simplified licensing/notification process.
- Two respondents suggested that ComReg extend the 71-76 GHz and 81-86 GHz frequency band utilisation proposal to adopt both options for channel arrangements presented in CEPT Recommendation ECC/REC/(05)07⁷.
- One respondent recommended that defined channel plans within the 71-76 GHz and 81-86 GHz frequency bands, such as those set out in CEPT recommendation ECC/REC/(05)07, should not be mandated
- One respondent had concerns in relation to the minimum radio interface capacity (RIC) specifications recommended in appendix B of the consultation, indicating that high capacity equipment may place an unnecessarily high cost burden on potential licensees, and therefore render potential deployments within the bands uneconomic.

⁷ Available on the ERO website: www.ero.dk

3.3 ComReg Position

ComReg's position is outlined below in relation to the specific points raised by the respondents.

1. Opening the 71-76 GHz and 81-86 GHz bands for commercial use

All 12 respondents were supportive of ComReg's proposal to open this spectrum for commercial applications. ComReg believes that opening these bands for commercial use will provide new opportunities and viable wireless alternatives to what has heretofore been exclusively in the domain of fibre based solutions. Therefore it is ComReg's intention to proceed with opening the bands for commercial applications.

2. Potential for Technology Neutrality within the 71-76 GHz and 81-86 GHz bands

ComReg's general policy is to make spectrum available to the market in a technology and service neutrality manner where possible. It is clear to ComReg that there is a demand to open this band for fixed services, but there is very little evidence to suggest that there is any similar demand to employ these bands for non-fixed services such as satellite, mobile or amateur use. It is therefore ComReg's intention to open this band for fixed services.

In relation to the type of fixed service that can be used in these bands, ComReg notes that there are agreed standards and recommendations⁸ within Europe for the deployment of fixed wireless point-to-point radio links within these bands. Furthermore, the successful tests that were carried in Ireland over the last number of months were based upon these standards and demonstrated that point-to-point radio links are a potentially suitable service for this band. Given the above, it is ComReg's intention to open these bands for fixed wireless point-to-point radio link usage.

ComReg is cognisant that there may be demand for use of different services and technologies within these bands in the future, and will closely monitor any standards or recommendations which may be agreed. Consequently, ComReg may open these bands for additional technologies and services at a later date.

Taking all of the above considerations into account, ComReg has decided to proceed with opening the 71-76 and 81-86 GHz bands for point to point fixed wireless applications and will monitor developments to assess whether these bands should be opened for other applications in the future.

⁸ Applicable standards:
Band Plan Structure - CEPT Recommendation ECC/REC/(05)07
Antenna & equipment - ETSI Technical Specification TS 102 524

3. Full implementation of CEPT Recommendation ECC/REC/(05)07

Within CEPT Recommendation ECC/REC/(05)07 there are a number of channel arrangement options. ComReg's consultation proposed a partial implementation of this recommendation, namely opening the band for a duplex FDD arrangement, with a duplex separation of 10 GHz. A number of respondents recommended the full implementation of this recommendation, thereby allowing both TDD usage and the alternative FDD option which permits duplex channels within a single frequency band (i.e. either the 71-76 GHz or the 81-86 GHz band), with a duplex separation of less than 5 GHz.

ComReg recognises the merits of fully implementing CEPT Recommendation ECC/REC/(05)07 as this can maximise the potential for innovation and commercial development within these bands. ComReg has therefore decided to fully implement CEPT Recommendation ECC/REC/(05)07 which will open these bands for the following systems:

- FDD applications, with duplex spacing of 10 GHz
- FDD applications, with duplex spacing of less than 5GHz
- TDD applications

It should be noted that the possibility to aggregate channels will be applicable to all of the above systems.

Amended band plans reflecting ComReg's employment of all CEPT recommended channel arrangements are illustrated in Appendix A of this document.

4. Alternative Licensing Scheme

Some respondents suggested that ComReg consider an alternative licensing regime, which could entail a self-registration and self-coordination process, in place of ComReg's proposed licensing methodology which is to licence point to point links under the existing Radio Link Licence Regulations (S.I. No. 319 of 1992), and based upon the existing radio link licensing scheme for point to point links above 1 GHz.

ComReg notes the respondents' views and the fact that there is no such licensing approach in place at the moment. ComReg understands that the unique propagation and 'pencil beam' signal characteristics of point to point fixed wireless systems within these bands may enable such an approach to be adopted in the future. However in order to facilitate the early use of these bands, ComReg intends to implement its proposal for licensing this spectrum under the existing radio link licensing scheme as set out in consultation document 07/85.

5. Minimum Radio Interface Capacity (RIC) Issue

One respondent expressed a concern with regard to the minimum radio interface capacity (RIC) specifications as recommended in ETSI technical specification TS 102 524⁹.

ComReg notes this respondents concern but maintains its view that it is appropriate to implement minimum radio interface capacity (RIC) specifications as recommended in ETSI technical specification TS 102 524, in order to maintain consistency with the relevant standards.

⁹ 'Fixed Radio Systems; Point-to-Point equipment; Radio equipment and antennas for use in Point-to-Point Millimetre wave applications in the Fixed Services (mmwFS) frequency bands 71 GHz to 76 GHz and 81 GHz to 86 GHz'

4 80 GHz Application Process

ComReg has revised the point to point guidelines, 98/14R5¹⁰, opening the 71-76 GHz and 81-86 GHz frequency bands for point to point radio link licensing;

Applications for a point to point radio link licence within these bands should be made using the application form for a point to point radio link licence above 1 GHz¹¹.

¹⁰ Available from the ComReg website: ComReg Document 98/14R5
<http://www.comreg.ie/fileupload/publications/ComReg9814R5.pdf>

¹¹ Available from the ComReg website: ComReg Document 98/15R4
<http://www.comreg.ie/fileupload/publications/ComReg9815R4.pdf>

Appendix A: CEPT Recommendation ECC/REC/(05)07 channel arrangements

CEPT ECC Recommendation (05)07¹² sets out the frequency channel arrangement for fixed services operating in the 71-76 GHz and 81-86 GHz bands. This appendix provides a brief description of this recommendation for the pairing and aggregation of channels in this spectrum for FDD applications. It should be noted that the channels specified may also be used to accommodate TDD systems within a single band.

Pairing and Aggregation of channels within the 71-76 GHz & 81-86 GHz bands

Option 1:

Within each 5 GHz band, nineteen 250 MHz channels are defined, with a 125 MHz guard band at either end of each 5 GHz band. Channels are deployed in a duplex FDD arrangement, with a duplex separation of 10 GHz. Figure 1 illustrates this arrangement.

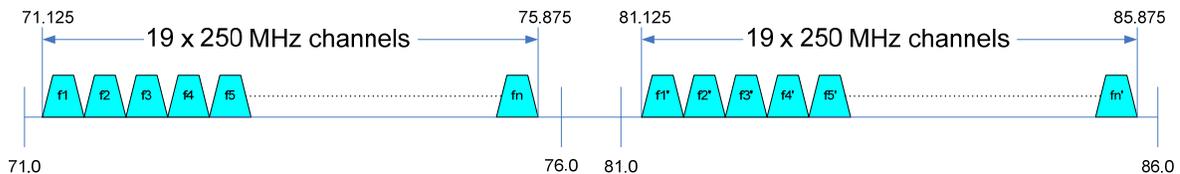


Figure 1: Combining channels from 71-76 GHz and 81-86 GHz in a single duplex FDD arrangement, with a duplex separation of 10 GHz.

Option 2:

The principle of duplex channels within a single band (i.e. 71-76 GHz or 81-86 GHz), with duplex separation of less than 5 GHz is illustrated in figure 2.

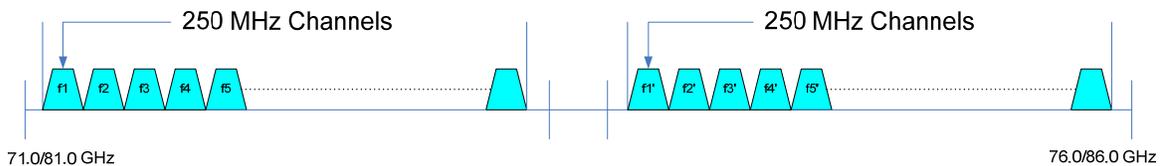


Figure 2: Combining channels from 71-76 GHz or 81-86 GHz in a single duplex FDD arrangement, with a duplex separation of less than 5 GHz.

¹² "Radio Frequency Channel Arrangements for Fixed Service Systems Operating in the Bands 71-76 GHz and 81-86 GHz" (available from www.ero.dk)

Aggregation of channels

When wider channels are required, for example with very high bit rate and very high system gain applications, then a flexible number of successive 250 MHz channels may be aggregated into FDD channels as illustrated in Figure 3, for duplex separation of 10GHz, or in Figure 4 for duplex separation of less than 5 GHz.

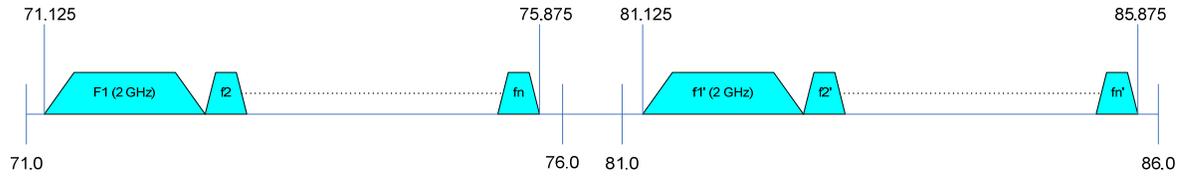


Figure 3: Example of aggregating multiple 250 MHz channels, possibly alongside original 250 MHz wide channels

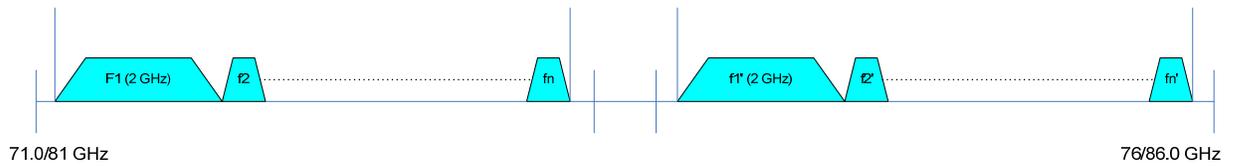


Figure 4: Example of aggregating multiple 250 MHz channels, possibly alongside original 250 MHz wide channels within the single band 71-76 GHz or 81-86 GHz