Commission for
Communications Regulation

Future of 2.6 GHz radio spectrum band

Publication of Consultation and Draft Decision on proposal to renew the MMDS licences in force at 18 April 2014 in the 2.6 GHz band from 19 April 2014 to 18 April 2016.

Response to Consultation and Draft Decision

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Executive Summary

The Commission for Communications Regulation ("ComReg"), in its capacity as manager of Ireland's radio spectrum, has been considering the future use of the 2.6 GHz spectrum band. The 2.6 GHz band (i.e. the radio spectrum in the frequency band from 2500 to 2690 MHz) is currently licensed in the State for the provision of pay-TV services re-transmitted and distributed using apparatus for Multipoint Microwave Distribution Systems ("MMDS").

The original rationale for issuing MMDS licences was to enable television viewers, in mainly rural areas that were not served by a cable television service, to receive a multi-channel TV service (other than by free-to-air means). This is because it was not considered economically viable to extend a cable network to cover such areas. At that time there was no alternative source of TV for viewers in rural areas, however, today there are other options such as free-to-air digital terrestrial TV (Saorview[1]), and pay and/or free-to-view satellite services.

On 18 April 2014 all MMDS licences in force are due to terminate and the existing rights of use to 2.6 GHz spectrum are due to expire with those licences. In this paper ComReg wishes to consult on a proposal to renew the MMDS licences for a period of 2 years to 18 April 2016 (in accordance with the applicable statute).

There are possible alternative uses of the 2.6 GHz band, which include next generation mobile broadband (NGMB) services. ComReg engaged Aegis Systems limited and Plum Consulting to review the technical feasibility of sharing the band between MMDS and NGMB and to analyse the costs and benefits to Ireland of an early release of the band for non broadcasting purposes as an alternative to renewing the current MMDS licences to 2019. Aegis and Plum's report (ComReg Document 11/80a) was published in November 2011. The current consultation includes a response by Aegis and Plum to comments received in relation to its report and ComReg's position on the issues raised.

ComReg has carefully considered arguments advanced by the existing MMDS operator, a selection of its subscribers (noting that their views may not be reflective of all consumers) and other organisations claiming to rely on MMDS for business as to why MMDS licences should be renewed for the longest period possible set out in the applicable statue (i.e. from 19 April 2014 to 18 April 2019). ComReg has, however, concluded that release of the band at the earliest feasible date on a service and technology neutral basis, which would not preclude the delivery of TV services by a

[1] www.saorview.ie Saorview is a free digital terrestrial television service received with a rooftop aerial.

successful bidder, would be the most economically beneficial alternative for Ireland. While the current MMDS licences expire in 2014, ComReg believes that it would not be feasible to conduct a competitive procedure which would result in the band being available on a service and technology neutral basis at that time. It therefore consults on a proposal to undertake a competitive award process for the 2.6 GHz spectrum so that from April 2016 new rights of use can be issued on a service and technology neutral basis. Details of the form of any competitive process for the award of new licences to come into effect in 2016 will be set out in a separate consultation. Accordingly, ComReg considers that the current MMDS licences should be renewed in the interim and that the appropriate renewal period for those MMDS licences still in force at 18 April 2014 is two years, to 18 April 2016.

1 Introduction

1.1 This paper is both ComReg's response to issues raised in submissions received in relation to a consultancy report titled '*Technical and Economic Study on Multipoint Microwave Distribution Systems and Next Generation Broadband Services in the band 2500 to 2690 MHz*' (ComReg Document No 11/80a) and a further consultation and Draft Decision on the future use of the 2.6 GHz spectrum band. In particular, ComReg consults in this paper on a proposal to extend the duration of the existing rights of use to 2.6 GHz spectrum for a period of 2 years to 18 April 2016. ComReg invites comment on this Draft Decision and any other issues raised in this document.

1.2 The 2.6 GHz band (i.e. the radio spectrum from the frequency 2500 to 2690 MHz) is currently licensed in the State for the provision of pay-TV services re-transmitted and distributed using apparatus for Multipoint Microwave Distribution Systems ("MMDS"). The existing rights of use to 2.6 GHz spectrum are set out in Wireless Telegraphy Act licences ("MMDS licences"), which were issued pursuant to the *Wireless Telegraphy (Multipoint Microwave Distribution System) Regulations 2003* (S.I. 529/2003) (the "2003 Regulations").

1.3 On 18 April 2014 all MMDS licences in force are due to terminate and the existing rights of use to 2.6 GHz spectrum are due to expire with those licences. However, the 2003 Regulations provide, amongst other things, for ComReg to review the operation of all such licences and subject to such terms and conditions as may be specified by it, to renew any such licences which are in force on that date for a further period of up to 5 years from 19 April 2014. Whilst the possibility for renewal must be considered, ComReg is aware that expiry of the MMDS licences also gives rise to the possibility of making new rights of use to 2.6 GHz spectrum available.

1.4 ComReg is considering undertaking a competitive award process for the 2.6 GHz spectrum so that when the existing rights of use to the spectrum expire, new rights of use can be issued on a service and technology neutral basis. As a result, holders of the new spectrum rights may choose to provide any service capable of being delivered using 2.6 GHz spectrum. For instance, the holder of new rights of use could distribute television programming content, subject to complying with the relevant technical conditions and to complying with any necessary broadcasting content authorisations, or adopt some other use consistent with rights of use to spectrum on a service and technology neutral basis.

1.5 This document considers these expiry related issues having regard to ComReg's functions, objectives and duties which are set out in statute including, in particular, those in relation to the management of Ireland's radio frequency spectrum.[2]

1.1 Purpose and scope of paper

1.6 The 2003 Regulations require ComReg, after such public consultation as it considers appropriate, to review the operation of licences continuing in force after 18 April 2010 and ComReg may, subject to such terms and conditions as may be specified by it, renew any such MMDS licences which are in force on that date for a further period of up to 5 years from 19 April 2014. This consultation represents the final step in the process commenced by ComReg in May 2010 to review the operation of the current licences and to consider their renewal in the context of an examination of potential alternative future uses and licensing options of the 2.6 GHz spectrum band.

1.7 In particular since May 2010, ComReg issued six relevant documents on the future use of the 2.6 GHz spectrum:

- **Document 10/38** Information Notice – Call for input on potential uses and future licensing options of the 2.6 GHz spectrum band;
- **Document 10/58s** Publication of submissions to ComReg Information Notice 10/38 – Views on future uses and licensing options of the 2.6 GHz spectrum band;
- **Document 11/80** Consultation Paper – Future of the 2.6 GHz radio spectrum band – Consultation sought views on extending the termination date of three MMDS licences in force in the 2.6 GHz band in Dublin, Galway and Waterford to 18th April 2014 and an update on the possibility of sharing the band between MMDS and other service capable of using 2.6 GHs spectrum;
- **Document 11/80a** Consultancy report – Technical and economic study on Multipoint Microwave Distribution Systems and Next Generation Mobile Broadband Services in the band 2500 to 2690 MHz;

[2] Three pieces of primary legislation in the State set out ComReg's key powers, functions, objectives and duties of relevance: (1) The Communications Regulation Acts 2002-2011(collectively referred to as the **"2002 Act"**), (2) The Wireless Telegraphy Acts (the "**WT Act"**; and (3) The Competition Acts (collectively referred to as **"the Competition Act"**). See also Chapter 2 and Annex 1.0 of this paper.

- **Document 11/80s** Submissions to Consultation 11/80; and

- **Document 12/09 (Decision No. 3 of 2012)** Decision to extend the termination date of three MMDS licences in force in the 2.6 GHz band in Dublin, Galway and Waterford to April 2014 so that they would terminate 18 April 2014 (the same date of expiry of the other seven MMDS licences in force in the band).

1.8 Aside from addressing submissions from interested parties on the future use of spectrum in the 2.6 GHz band[3], this document sets out ComReg's review of the operation of the MMDS licences (as required by Regulation 8 (1) of the 2003 Regulations) and includes a Draft Decision on a proposal to renew the current licences, and thereby extend the duration of the existing rights of use to 2.6 GHz spectrum, for a period of 2 years from 19 April 2014. The review is conducted in the context of the future use of the 2.6 GHz spectrum band and further details of this approach are set out in Chapter 2.

1.9 In conducting its review of the operation of the MMDS licences against a background of potential alternative uses of the band and in considering the potential future uses of spectrum in the 2.6 GHz band, in accordance with its statutory functions, objectives and duties, ComReg has also had regard to *inter alia* the following:

- Feasibility of sharing the band, noting that this would affect what spectrum rights might be available for award in the future[4];

- Estimates of the likely net economic benefits of release of the band on a service and technology neutral basis in 2014 compared to that release being delayed until 2019[5]; and

- International developments in relation to the uses of the 2.6 GHz band in other jurisdictions (a summary of these at Section 4.4)[6].

[3] Non-confidential versions of interested parties' submissions are set out in Documents 10/58s Documents 11/80s.

[4] Document 11/80a is Aegis and Plum's report on "Technical and economic study on Multipoint Microwave Distribution Systems and Next Generation Mobile Broadband Services in the band 2500 to 2690 MHz." (see Section 1.0 for a discussion of issues presented).

[5] Document 11/80a sets out Aegis and Plum's economic analysis of releasing the band for NGMB in 2014 compared to delaying that release until 2019. Aegis and Plum concludes that there are greater economic benefits to releasing the band earlier compared to later for example, it has also compared the benefits of releasing the band in 2017 relative to 2019.

1.10 ComReg agrees with the findings of the Aegis and Plum report (Document 11/80a), which found that sharing of the 2.6 GHz band between MMDS and alternative services is not likely to be feasible and that the better solution from a national economic perspective would be to release rights of use to spectrum in the band on a service and technology neutral basis as early as possible.

1.11 ComReg herewith publishes a draft RIA on possible timing options based on the year in which new rights of use to 2.6 GHz spectrum in the State could be made available on a service and technology neutral basis. That draft RIA is set out in full at Annex 2 but a summary of the main conclusions are provided in Chapter 5.

1.12 ComReg recognises that the process of releasing new rights of use to 2.6 GHz spectrum for alternative services will take some time. In particular, ComReg identifies the following main matters affecting the earliest possible commencement of new rights of use to 2.6 GHz spectrum[7]:

- Consulting on all relevant matters for any potential award including such as the potential for a joint award with other suitable spectrum bands having regard to international trends and future demands for spectrum. ComReg notes that rights of use to the 2.3 GHz spectrum band might usefully be considered in this regard;

- Achieving a practical timetable for awarding new rights of use to 2.6GHz spectrum (and any other spectrum band), consulting and settling on same. This may involve stakeholder workshops and/or time to test any functionality intended to achieve an efficient award outcome; and

- Conducting the competitive award process itself.

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[6] The 2.6 GHz band has been allocated within Europe and worldwide for the provision of International Mobile Telecommunications ("IMT") which could provide Next Generation Mobile Broadband ("NGMB") services.

[7] Based on ComReg's recent experience of the time spent carefully developing its Multi-Band Spectrum Auction (MBSA), where its process has been ongoing since July 2009 and has involved six main consultations and responses, including careful analysis of over 2900 pages of respondents' views and independent reports on all of its proposals, ComReg currently believes that it could only likely make new rights of use to 2.6 GHz spectrum available by April 2016 at the earliest (see also http://www.comreg.ie/radio_spectrum/consultations_and_associated_documents.713.1096.html)

1.13 Accordingly, interested parties might usefully note that the specific details of any future potential award for rights of use to the 2.6 GHz band will be addressed separately.

1.14 Given the factors outlined above, ComReg considers that it is technically and economically preferable to release the band on a service and technology basis as early as possible but that, as the process is likely to take some time it would be appropriate to renew the existing MMDS licences under the 2003 Regulations for a period of 2 years, after which the licences and the corresponding spectrum rights of use would expire altogether and new rights of use to 2.6 GHz spectrum would be made available on a service and technology neutral basis. ComReg invites comments on this proposal (set out at Chapter 5) and indeed on any other issues that arise as a consequence of this document.

1.2 Document Structure

1.15 This Document is structured as follows:

- **Chapter 1** (this chapter) sets out the introduction to the Document;
- **Chapter 2** set outs the legal background and details of ComReg's approach to the review of the operation of existing MMDS licences in the context of the future use of the 2.6 GHz spectrum band;
- **Chapter 3** is a technical chapter, which addresses submissions received in relation to the technical aspects of Document 11/80a and outlines ComReg's position on same;
- **Chapter 4** addresses submissions received in relation to the non-technical and economic aspects of Document 11/80a and sets out ComReg's position on the potential timing of making new rights of use to 2.6 GHz spectrum available;
- **Chapter 5** sets out the Consultation Issue on ComReg's proposal to extend the duration of the existing rights of use to 2.6 GHz spectrum for a period of 2 years;
- **Chapter 6** sets out relevant next steps and how to make submissions. The closing date for submitting comments will be 2pm on 31 January 2013.

1.16 Four annexes support the above chapters and are as follows:

- **Annex 1.0** ComReg's legal framework (at Document 12/132a);
- **Annex 2.0** Draft Regulatory Impact Assessment (draft RIA) (at Document 12/132a);
- **Annex 3.0** Document 12/132b Aegis and Plum Response Document; and
- **Annex 4.0** Draft Decision on renewing the existing MMDS licences for two years from 18 April 2014 (at Document 12/132a).

2 Background

2.1 Introduction

2.1 This chapter sets out background material in relation to ComReg's review of the operation of the current MMDS licences along with its consideration of suggested future uses and potential licensing options of the 2.6 GHz spectrum band. This material is also relevant in relation to ComReg's proposal to renew the current MMDS licences and the associated spectrum rights of use for a period of 2 years and thereafter to release the 2.6 GHz spectrum band on a service and technology neutral basis.

2.2 In particular it sets out:

- An overview of the supporting legal framework;
- An overview of the European context in relation to the 2.6 GHz spectrum band and the EU's perspective on MMDS use in the band; and
- An overview of the review of the operation of the existing MMDS licences setting out ComReg's approach to that review.

2.2 Overview of legal framework

2.3 The Communications Regulation Acts 2002-2010[8] (the "2002 Act"), the Common Regulatory Framework (including the Framework and Authorisation Directives[9] as transposed into Irish law by the corresponding Framework and Authorisation Regulations[10]), and the Wireless Telegraphy Acts[11] set out, amongst other things, powers, functions, duties and objectives of ComReg that are relevant to this response to consultation and draft decision.

2.4 It should be noted that the 2003 Framework and Authorisation Regulations which originally transposed the Framework and Authorisation Directives into Irish law were, on 1 July 2011, revoked and replaced by the following regulations which transpose the amended Framework and Authorisation Directives:

- the European Communities (Electronic Communications Networks and Services) (Framework) Regulations 2011 (S.I. No. 333 of 2011); and
- the European Communities (Electronic Communications Networks and Services) (Authorisation) Regulations 2011 (S.I. No. 335 of 2011).

[8] The Communications Regulation Act 2002, the Communications Regulation (Amendment) Act 2007 and the Communications Regulation (Premium Rate Services and Electronic Communications Infrastructure) Act 2010.

[9] Directive No. 2002/21/EC of the European Parliament and of the Council of 7 March 2002 (as amended by Regulation (EC) No. 717/2007 of 27 June 2007, Regulation (EC) No. 544/2009 of 18 June 2009 and Directive 2009/140/EC of the European Parliament and Council of 25 November 2009) (the "Framework Directive") and Directive No. 2002/20/EC of the European Parliament and of the Council of 7 March 2002 (as amended by Directive 2009/140/EC) (the "Authorisation Directive")

[10] The European Communities (Electronic Communications Networks and Services) (Framework) Regulations 2011 (S.I. No. 333 of 2011) and the European Communities (Electronic Communications Networks and Services) (Authorisation) Regulations 2011 (S.I. No. 335 of 2011) respectively which revoke and replace S.I.307 of 2003 and S.I. 306 of 2003 respectively.

[11] The Wireless Telegraphy Acts, 1926 and 1956, the Broadcasting Authority Acts, 1960 to 1971, in so far as they amend those Acts, the Wireless Telegraphy Act 1972, Sections 2 , 9, 10,11,12,14,15,16,17 and 19 of the Broadcasting and Wireless Telegraphy Act 1988 and Sections 181 (1) to (7) and (9) and Section 182 of the Broadcasting Act 2009.

2.5 References in this Document or in the appended draft decision to either the Framework or Authorisation Regulations should be understood as referring to the above 2011 regulations, unless the context suggests otherwise.

2.6 Apart from licensing and making regulations in relation to licences, ComReg's functions include the management of Ireland's radio frequency spectrum in accordance with ministerial Policy Directions under Section 13 of the 2002 Act, having regard to its objectives under Section 12 of the 2002 Act, Regulation 16 of the Framework Regulations and the provisions of Article 8a of the Framework Directive. ComReg is to carry out its functions effectively, and in a manner serving to ensure that the allocation and assignment of radio frequencies is based on objective, transparent, non-discriminatory and proportionate criteria.

2.7 Annex 1 is intended as a general guide as to ComReg's role in this area, and not as a definitive or exhaustive legal exposition of that role. Further, Annex 1 restricts itself to consideration of those powers, functions, duties and objectives of ComReg that appear most relevant to the matters at hand and by way of example excludes those in relation to premium rate services.

2.3 Overview of European context

2.8 The issue of the future use of the 2.6 GHz band has been considered at a European level.

2.3.1 EC Decisions relevant to the 2.6 GHz spectrum band

2.9 Two EC Decisions specifically identify (and designate) the 2.6 GHz radio spectrum band for European wide harmonisation for terrestrial systems capable of providing electronic communications services in the Community, and require that the authorisation process for it should be carried out in accordance with Directive 2002/20/EC by 31 December 2012:

- European Commission Decision on *"the harmonisation of the 2500 – 2690 MHz frequency band for terrestrial systems capable of providing electronic communications services in the Community"* [12] ("Commission Decision 2008/447/EC"); and

[12] European Commission Decision on "the harmonisation of the 2500 – 2690 MHz frequency band for terrestrial systems capable of providing electronic communications services in the Community". http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008163:0037:0041:EN:PDF.

- European Commission Decision on *"establishing a multiannual radio spectrum policy programme"*[13] (the "RSPP Decision").

2.10 Recital (2) of Commission Decision 2008/447/EC states:

- "*The designation of the 2500-2690 MHz band for systems capable of providing* electronic *communications services 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***." [emphasis added].

2.11 In addition, Article 6.2 of the RSPP Decision says that:

- *"In order to promote wider availability of wireless broadband services for the benefit of citizens and consumers in the Union, member states shall make the bands covered by Decisions ….2008/477/EC …. Available under terms and conditions described in those decisions. Subject to market demand, Member States* ***shall carry out the authorisation process by 31 December 2012 without prejudice to the existing deployment of services****, and under conditions that allow consumers easy access to wireless broadband services."* [emphasis added].

2.12 In relation to the possibility of conducting an authorisation process by 31 December 2012, ComReg notes that the current rights of use set out in the existing MMDS licences remain in force until April 2014 after which they expire unless renewed. This has a bearing on the earliest time ComReg could carry out an authorisation process for new rights of use to 2.6 GHz spectrum but there are also other considerations which are set out and considered in Chapter 5.0.

2.3.2 EU perspective on MMDS

2.13 ComReg notes that MMDS use of the 2.6 GHz band has been considered at an EU level. For example, an Explanatory Memorandum drawn up by Radio Spectrum Committee explains how MMDS may be handled within the scope of the Commission Decision 2008/447/EC.

[13] European Commission Decision on *"establishing a multiannual radio spectrum policy programme".* http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2012:081:0007:0017:EN:PDF.

2.14 The Explanatory Memorandum notes that several aspects need to be taken into account to ensure an MMDS can be compliant with Commission Decision 2008/447/EC. These aspects depend on the geographical spread and the amount of spectrum used for an MMDS. Three main levels of MMDS deployment are noted in the document:

1. Limited use, short expiration deadline;

2. Partial frequency use, long expiration deadline; and

3. Substantial to total frequency use, long expiration deadline.

2.15 Ireland is currently categorised as having the third level of MMDS deployment from this list above. Even though the Explanatory Memorandum concludes that MMDS can be handled within the scope of the Commission Decision 2008/447/EC, the Radio Spectrum Committee notes that use of the band for MMDS could mean that the availability of new licences in accordance with the objectives of the Commission Decision 2008/447/EC is likely to be hampered.

2.16 Consequently, Member States with this level of MMDS deployment are called upon to investigate the extent to which the MMDS operator is using the frequencies efficiently and whether the occupation of the entire 2.6 GHz band is justified.

2.17 ComReg's review of the operation of existing licences is conducted having regard to the European context that appears relevant to ComReg and whether, and to what extent, it appears to impact ComReg's proposal. An overview of ComReg's approach is set out in the next section.

2.4 Review of the operation of the existing MMDS licences

2.4.1 Overview of ComReg's approach to the review

2.18 ComReg conducts this review in accordance with its statutory functions, objectives and duties in relation to spectrum (summarised above) and in the context of the future use and licensing options for 2.6 GHz spectrum rights.

2.19 In conducting the review ComReg will have regard to all the relevant material before it, including the submissions received over the course of this consultation process. The non-confidential versions of those submissions received to date are set out in Document 10/58s and 11/80s. In particular, ComReg will have regard to the following:

1. Feasibility of sharing the band, noting that this would affect the extent of any new spectrum rights that might be available for award in the future.[14] Chapter 3 sets out an analysis of, and response to, submissions received in relation to the technical aspects of sharing the 2.6 GHz spectrum band between MMDS uses and Next Generation Mobile Broadband ("NGMB") (being a proxy for any other service which can use that spectrum). ComReg's position on these matters is also set out in Chapter 3.

2. Estimates of the likely net economic benefits of release of the band on a service and technology neutral basis in 2014 compared to delaying its release until 2019 and renewing the existing MMDS licences in their current form for that period. In this connection, Aegis and Plum concluded that the greatest economic benefits would be realised from releasing the band earlier as compared to delaying its release for any period up to 2019 (details of its study are set out in Document 11/80a). This is considered in Chapter 4 together with ComReg's position on the timing of making new spectrum rights available;

3. Relevant EC Decisions some of which seem to indicate that new rights of use to 2.6 GHz spectrum should mainly target end-user access to broadband communications;

4. EU's perspective on MMDS (as set out by the Radio Spectrum Committee[15]); and

5. International developments in relation to the uses of the 2.6 GHz band in other jurisdictions (a summary of these in section 4.4 below).[16]

2.20 ComReg notes that the above points relate to broader radio spectrum policy matters, which ComReg considers provides necessary context in order to fully and impartially assess the potential future licensing options for the 2.6 GHz band.

[14] Document 11/80a is Aegis and Plum's report on "Technical and economic study on Multipoint Microwave Distribution Systems and Next Generation Mobile Broadband Services in the band 2500 to 2690 MHz." (see Section 1.0 for a discussion of issues presented).

[15] The Radio Spectrum Committee ("RSC") is responsible for specific technical measures required to implement the broader Radio Spectrum Policy of the European Union. The RSC is composed of Member State representatives and chaired by the European Commission.

[16] The 2.6 GHz band has been allocated within Europe and worldwide for the provision of International Mobile Telecommunications ("IMT") which could provide Next Generation Mobile Broadband ("NGMB") services.

2.4.2 Respondent's views on ComReg's approach

2.21 In its non-confidential submission to Document 11/80, UPC makes several claims that ComReg's approach to the review does not *"…actually constitute or satisfy ComReg's obligations in relation to conducting this review ['to review the operation of all such licences granted']"* (page 4 of its submission).

2.22 UPC's main claims may be summarised as follows: [17]

1. ComReg has not clearly and unambiguously stated its intention to conduct the review of the operation of the MMDS licences and provided details of its terms of reference for the review;

2. ComReg potentially prejudices its own consideration of the issues *"…by attempting to pre-determine and/or limit the range of issues to be considered within the wider and more specific review of the current MMDS licences that ComReg has yet to commence…* (page 6 of its non-confidential submission)*"*; and

3. ComReg has failed to act with urgency in relation to the review and *"…has adopted such a selective approach which we think is highly unusual in terms of consulting on issues of public concern to stakeholders…"* (page 6 of its non-confidential submission).

2.23 UPC asserts that as a result of the above ComReg is not complying with its statutory obligations to conduct such a review as is provided for under the 2003 Regulations.

2.24 UPC also provides views on the approach that ComReg should consider. At page 5 of its non-confidential submission to Document 11/80, UPC suggests that the review could include, for example, an assessment of the effectiveness of the MMDS pay-TV platform to date (in terms of how it has promoted competition for pay-TV services and the level of customer satisfaction) and an examination of the future prospects for the service up to 2019. In addition it asserts that ComReg should carefully assess the likely positive and negative factors relating to licence renewal from 2014 to 2019.[18]

[17] Where a review or summary is provided, whether of previous ComReg Documents, respondents' submissions or expert reports reference should be made to the original documents for the definitive version thereof.

[18] UPC also proposed that ComReg should have regard to the Ministerial Policy Direction No. 4 of 2003 on Industry Sustainability and this is considered in Section 4.5 of this Document.

2.4.3 ComReg's assessment and response

2.25 ComReg has considered UPC's submissions and rejects its claims that the proposed approach to the review would not constitute the standard of review which is required by Regulation 8 of the 2003 Regulations.

2.26 Having regard to UPC's stated concerns, summarised in paragraph 2.22 above, in relation to the terms of reference of the review and the assertion that ComReg may have pre-determined or limited the issues to be considered, ComReg would respond as follows:

- This paper sets out a wide range of material being considered by ComReg in its review and details how ComReg has weighed up all of the relevant information before it in relation to this matter. Where respondents have any further submission to make they are now invited to do so, explaining their views and providing reasons and analysis to support their views;

- This paper includes a draft RIA (attached at Annex 2) which assesses the potential impacts on stakeholders, competition and consumers.[19] Where possible, the draft RIA includes an assessment of the views submitted by stakeholders;and

- Regulation 8(1) of the 2003 Regulations gives ComReg discretion in relation to conducting a public consultation prior to forming a determination to renew any of the MMDS licences for some period of time up until 18 April 2019, or forming a determination not to renew such licences. ComReg refers to the clause within Regulation 8(1) which is highlighted in bold below: *The Commission will, after 18 April 2010, and subject to such conditions and restrictions as are prescribed in regard thereto by these Regulations, and* ***after such public consultation (if any) as the Commission considers appropriate, review the operation of all such licences*** *so granted and continuing in force and may subject to such terms and conditions as may be specified by the*

[19] The draft RIA is prepared in accordance with ComReg's RIA Guidelines (Document 07/56a) ("RIA Guidelines") and has regard to the RIA Guidelines issued by the Department of An Taoiseach in June 2009 ("Department's RIA Guidelines") and any relevant Policy Directions issued to ComReg by the Minister for Communications, Energy, and Natural Resources under Section 13 of the 2002 Act (the "Policy Directions").

Commission renew any such licences which are in force on that date for a further period of up to 5 years from 19 April 2014.

2.27 ComReg considers that the substantive issue to be considered in the lead up to the expiry date of the existing MMDS licences, which is 18 April 2014, is the option available to ComReg in respect of future licensing of the 2.6 GHz band going forward. Those options are informed by the review of the operation of the existing MMDS licences against the background of potential alternative uses of 2.6GHz spectrum. In this regard, ComReg considers its approach to be appropriate in particular ComReg notes that its approach allows for a balanced consideration of the following:

- The possibility of making new rights of use to 2.6 GHz spectrum available on a service and technology neutral basis noting that this would not prevent a new rights holder from distributing TV programming if it chose to do so; and

- The implications for consumer welfare and the national economic perspective arising from facilitating an expansion of the range of potential services capable of being delivered using the 2.6 GHz spectrum band.

2.28 Indeed the above approach set out here is line with ComReg's general approach to service and technology neutrality.[20]

Overview of history of MMDS in Ireland

2.29 The Wireless Telegraphy (Television Programme Retransmission) Regulations, 1989 (the "1989 Regulations") established a licensing regime for MMDS to distribute licensed television programming content in areas not covered by a cable licence (being a licence issued pursuant to the Wireless Telegraphy (Wired Broadcast Relay Licence) Regulations, 1974). As a result, most rural areas had access to a platform making multichannel television available to them.

2.30 In total 10 MMDS licences comprising 29 available licence areas (referred to as 'cells'[21], see figure 1.0), were granted under the 1989 Regulations to

[20] See also ComReg Document 11/89, Strategy for Managing the Radio Spectrum. In addition ComReg notes that Recital 69 of Directive 2009/140/EC states *"…Where rights of use contain a provision for renewing their validity, competent national authorities should first carry out a review, including publication consultation, taking into account market, coverage and technological developments. …"*.

several commercial operators. The 1989 Regulations were replaced in 1999 by the Wireless Telegraphy (Programme Services Distribution) Regulations, 1999 (S.I. 73 of 1999) (the "1999 Regulations"), which allowed for the continuance in force of the existing 10 licences, until April 2014. The 1999 Regulations also included *inter alia* a regulation concerning the renewal of licences.[22] The 1999 Regulations issued on foot of a public consultation conducted by the ODTR and titled *Television Transmission Licensing for Cable and MMDS Systems* (Doc No. ODTR 98/63) and ComReg has had regard to the contents of that consultation in it its consideration of the matters at issue herein.

[21] The term 'cells' was used to define particular geographic areas, defined by a centre point, given in Irish Grid Reference format, and extending for a radius/range, given in miles. Together the 29 cells provide a coverage footprint to most of the State.

[22] See Regulation 7 (1) and (2) of the 1999 Regulations for more information on the possibility of licence renewal in the 1999 Regulations.

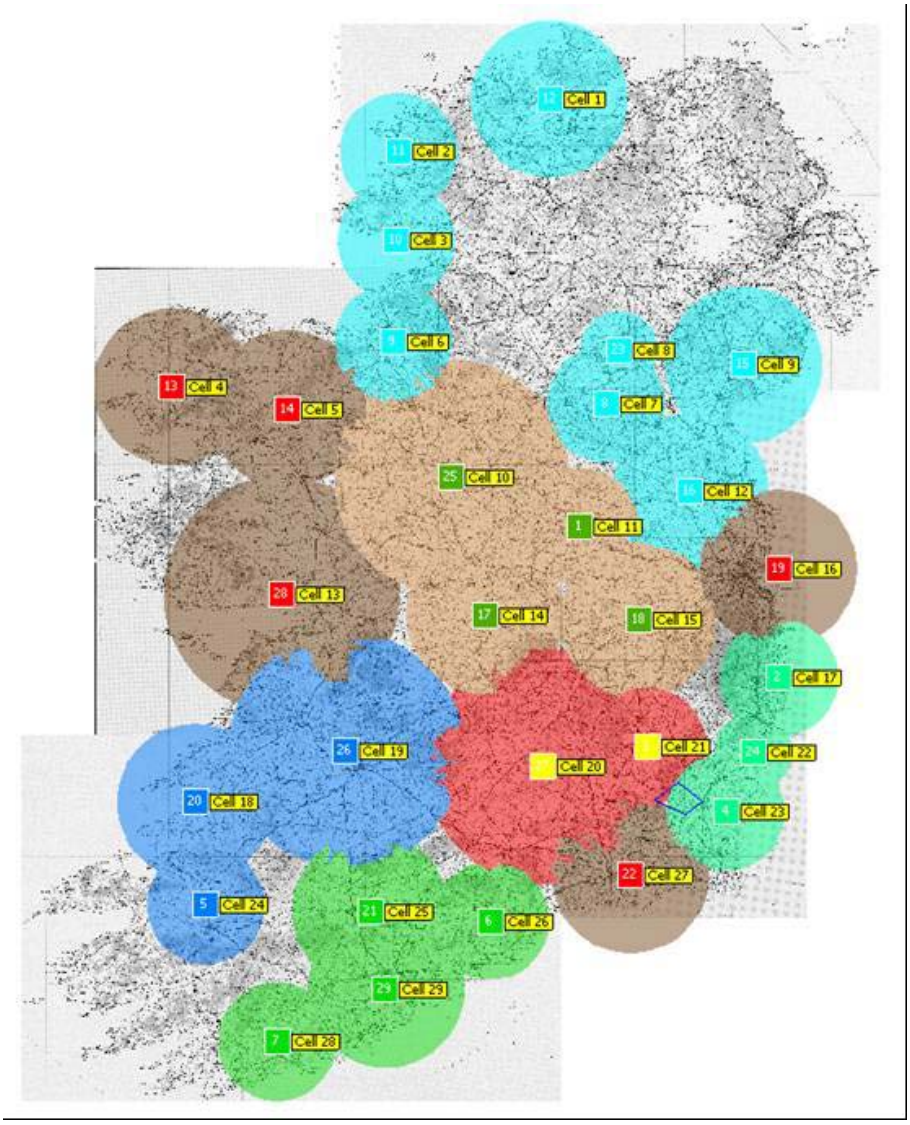

Figure 1 Indicative MMDS licence areas

2.31 There was considerable consolidation of MMDS operators in the period 1989 to 2000 as a result of which just two main MMDS operators trading as Chorus and NTL remained. Chorus held 7 MMDS licenses and NTL held the remaining three. In 2001, the term of the three NTL MMDS licences in Dublin, Galway and Waterford was shortened by two years as a consequence of a regulatory compliance action.[23]

2.32 In 2003, the 1999 Regulations were replaced by Wireless Telegraphy (Multipoint Microwave Distribution System) Regulations 2003 (S.I. 529 of

[23] See ComReg Media Release No. "*pres011002.pdf*".

2003) (the "2003 Regulations").[24] Changes to the licences were proposed and agreed with the then licensees and new licences were issued pursuant to the 2003 Regulations.

2.33 In 2005 Chorus and NTL merged to form UPC Communications Ireland Ltd ("UPC") and today UPC holds all ten MMDS licences in the State.

2.34 In 2010 ComReg commenced a process to review the future uses of and potential licensing options for the 2.6 GHz band.

2.35 In 2012, as part of its review, ComReg issued Document 12/09 ("Decision Number 3 of 2012"), which set out ComReg's Decision to co-terminate the expiry date of all ten licences by extending the termination of the three licences in force in Dublin, Galway and Waterford. [25] As a result of that parallel consultation process, the current expiry date for all the rights of use to 2.6 GHz spectrum is 18 April 2014.

2.4.4 Context of MMDS pay-TV services in the State

2.36 MMDS is a terrestrial pay-TV platform that complements 'cable TV' given its origins as a platform to distribute multi-channel TV outside of areas with cable connectivity.

2.37 MMDS competes with pay-TV satellite services, and in the pay-TV market UPC's main competitor is *BSkyB*. For viewers of multi-channel TV services in the State, other potential alternatives to MMDS services include free-to-air TV services provided by SAORVIEW[26] and free-to-view services on satellite such as Freesat[27]. ComReg provides further details of the pay-TV market in

[24] This was to take account of the European Common Regulatory Framework for Electronic Communications Networks and Services and the Communications Regulation Act, 2002, noting that the MMDS licences were first issued by the Office of Director of Telecommunications Regulation (ComReg's predecessor) pursuant to the 1999 Regulations as set out above. Further, in 2003 cable TV operators became unregulated entities and no cable licences were in force from the point onwards. To date there remains only a few small independent cable TV companies.

[25] See Decision Number 3 of 2012 ("D 03/12, Document 12/09") for a discussion of the issues presented.

[26] See www.saorview.ie for a list of free-to-air television services available in the State on Saorview.

[27] www.freesat.co.uk Services available in the State on Freesat include the UK free-to-air BBC, ITV and Channel 4 services

the State at Section 2.1.4 of Annex 2.0, where it considers impacts on competition under two options detailed therein.

2.38 The combined footprint of the existing 10 MMDS licenses covers most of the State (see figure 1.0), suggesting that MMDS services are available to in excess of 700,000 homes, should consumers wish to subscribe to them.

2.39 The number of paying MMDS subscribers, as at Q3 2012, is 47,900.[28] This is a significant decline from the peak number of 114,512 subscribers, which was reached in Q3 of 2006. The significant decline in MMDS subscribersis attributed to viewers switching to alternative multi-channel TV providers.

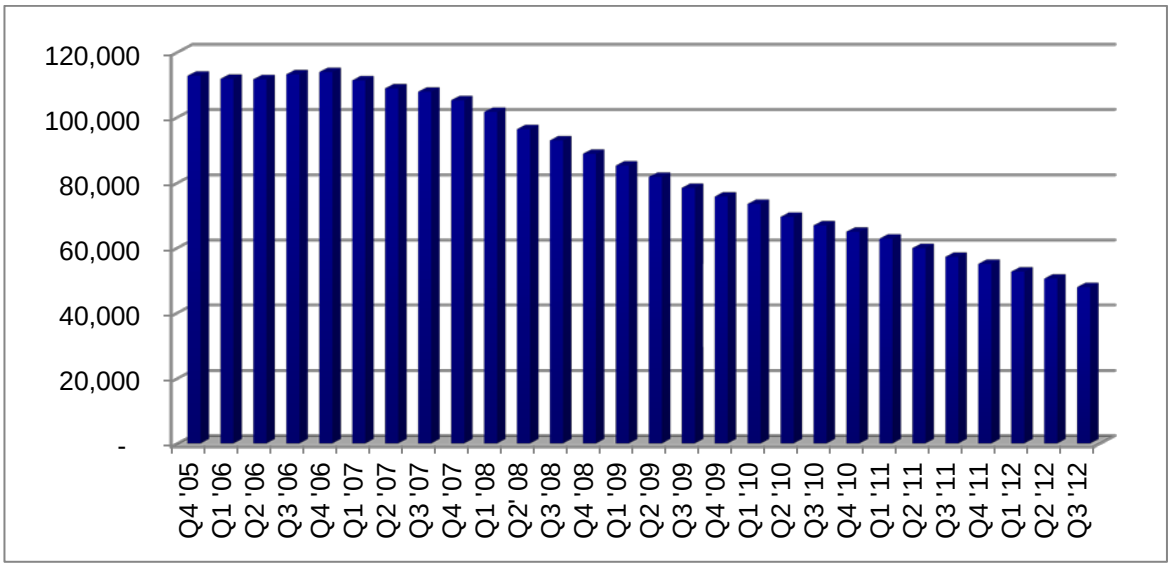

Figure 2.0 Number of MMDS Subscribers in Ireland

2.40 By way of further background, ComReg also notes the following features of the MMDS TV services. A comparison of these is set out in the draft RIA at Annex 2 (see also Figure 3.0 below). ComReg notes that due to legacy technology issues, whereby the MMDS services outside Dublin, Galway and Waterford do note operate using the cable technology, additional functionality (such as digital video recorder, etc) that is available from Sky, is not available to all existing MMDS customers.

[28] http://www.lgi.com/PDF/press-release/LGI-Press-Release-Q3-2012-Final.pdf

		UPC MMDS	Sky Satellite	SAORVIEW / Freesat
Basic Package	Description	38 Channels[29] Includes - Irish FTA, UK FTA, Setanta Ireland, Sky 1, Discovery Channel	50 Channels Includes – Irish FTA, UK FTA, Sky 1, Sky Atlantic, Sky Living, Sky Arts	Over 50 Channels including UK FTA via Freesat and Irish FTA channels on SAORVIEW
	Monthly Fee	€26.00	€25	N/A
Max Package	Description	Around 80 Channels Includes –Select Sky Sports channels, Select Sky Movie channels	Over 100 Channels Includes – Full HD Sky Sports Suite, Full HD Sky Movies Suite, ESPN,	No option to avail of premium channels but high definition channels available (no pay per view sports)
	Monthly Fee	€79.71	€111	N/A
HD Capable		✘	✓	✓
DVR Compatible		✓[30]	✓ Sky plus	✓[31]

Figure 3.0 Comparison of multi-channel TV product offerings available in the State.

2.41 Some of the claimed benefits associated with the MMDS service are set out in submissions to ComReg received over the course of this consultation (Documents 10/58s and 11/80s) [32]. In particular, it is claimed that MMDS has a positive impact on competition in the pay-TV market and acts as a source of direct business for some small and medium traders in TV services, such as businesses providing consumables/components for receiving MMDS services. These submissions are considered and addressed in the draft Regulatory Impact Assessment set out at Section 2.1.3 of Annex 2.0.

MMDS spectrum usage and efficiency

[29] Certain areas may have less

[30] Available in previously NTL licensed areas and not available in previously Chorus licensed areas due to legacy technology differences

[31] Only certain models of consumer set top boxes

[32] See also Section 2.1.3 at Annex 2.0 on Draft Regulatory Impact Assessment where ComReg addresses impacts on stakeholders.

2.42 To distribute its MMDS service, UPC utilises 18 individual channels in the 2.6 GHz band, each with a bandwidth of 8 MHz. UPC thereby is licensed to use 144 MHz of 190 MHz spectrum available in the 2.6 GHz band. In terms of efficient spectrum usage, the 2.6 GHz band could in theory be used to make MMDS services available to more than 700,000 homes throughout the State, should consumers wish to subscribe to such a service. However, the actual number of subscribing household is 47,900, and appears to be in steady decline.

3 Extent of new 2.6 GHz spectrum usage rights

3.1 Introduction

3.1 In Document 11/80, ComReg asked the following question based on Aegis and Plum's views on MMDS and NGMB services in the 2.6 GHz band, as set out in Document 11/80a:

Q. 1	Please provide your views on the possible approach of allocating 2.6 GHz spectrum using a technology and service neutral competitive process as outlined by Aegis and Plum?

3.2 A key consideration in responding this question is whether it would be possible to share the 2.6 GHz spectrum between the existing MMDS service and any possible new services and, if so, what type of sharing might apply.

3.3 Exploring these sharing issues provides information on the potential extent of new rights of use to 2.6 GHz spectrum. For example, if sharing is feasible then ComReg might consider licensing both MMDS and NGMB in the 2.6 GHz band. If sharing is not feasible, however, ComReg would have to decide whether, after April 2014 the band should continue to be licensed for MMDS for a period of up to five years, or should it be made available immediately on a service and technology neutral basis.

3.4 This chapter presents ComReg's assessment of, and response to, the views submitted by interested parties on these sharing related issues. ComReg's assessment of the feasibility of sharing the 2.6 GHz band forms one part of its overall review of the operation of the existing licences and its decision in

relation to the renewal of licences for a further period of up to 5 years from 19 April 2014 (see Section 2.4).

3.2 Assessment of technical responses to document 11/80a

3.2.1 Summary of Aegis and Plum's Technical evaluation as per 11/80a

3.5 In Section 3.2.1 of consultation document 11/80, an introduction to Aegis and Plum's modelling approach, technical analysis and conclusions in relation to potential sharing options in the 2.6 GHz band states:

"In considering the potential for sharing, Aegis and Plum performed a technical analysis to examine the implications of uplink and downlink interference paths in the following cases:

- *Interference from NGMB base station ("NGMB BS") transmitter into MMDS receiver;*
- *Interference from NGMB user terminal ("NGMB MS") transmitter into MMDS receiver;*
- *Interference from MMDS transmitter into NGMB BS receiver; and*
- *Interference from MMDS transmitter into NGMB MS receiver.*

The above modelling approach was used to derive minimum separation distance requirements from the edge of MMDS coverage area for co-channel and adjacent channel operating conditions in the following four scenarios:

1. *In the same geographic area co-channel operating conditions;*
2. *In the same geographic area adjacent channel operating conditions;*
3. *In different geographic area co-channel operating conditions; and*
4. *In different geographic area adjacent channel operating conditions.*

Taking the co-channel and adjacent scenarios in turn, Aegis and Plum are of the view that:

- *Scenarios of MMDS co-channel interference into NGMB BS receivers require the largest separation distances (between 45.6 and 67.5km)[33]. The requirement for such separation distances means that it would be unlikely to be feasible for the two services to share the band on a co-channel basis, as MMDS has virtually contiguous geographic coverage; and*
- *Adjacent channel sharing requirements are determined by the Net Filter Discrimination ("NFD") level, which depends on transmitter and receiver*

[33] For an MMDS effective radiated power ("EIRP") of 18dBW/8 MHz the minimum separation distance distances from the edge of the MMDS coverage area are between 45.6 and 67.5km when an MMDS effective transmitter height is assumed to be between 100 and 300m.

selectivity masks and require a separation distance of 14.5km.[34] Further in the adjacent channel case scenarios, Aegis and Plum conclude that it would be necessary for MMDS transmitters to be moved to radio frequency channels away from NGMB ones to provide adequate NFD levels or for additional filtering to be added to minimise the size of guard bands and / or to minimise the separation distances. In this regard, Aegis and Plum consider that the option of moving radio frequency channels away from potential NGMB ones would not be feasible as the current plan of radio frequency channels uses all the odd channels or all the even channels at a given MMDS transmitter site[35]. This means that sharing the band is most likely never going to prove to be an efficient use of spectrum.

Finally, the Report notes that the separation distances could possibly be reduced, and therefore the feasibility of sharing improved, if mitigation techniques were applied to reduce interference. The mitigation techniques outlined in the Report include the following:

- *Reducing the interfering transmitter effective isotropic radiated power ("EIRP"), as this could decrease the required separation distances, however, at the expense of a reduced coverage area. This could have implications for MMDS service depending on the geographic location of its users;*
- *Operating MMDS and NGMB on opposite polarisations, as this could reduce separation distances particularly for certain cases. It should however be noted that mobile systems generally operate at slant polarisation and this would provide only limited polarisation discrimination at MMDS receivers;*
- *Operating the receiver below the local clutter height, as an additional path loss could be applied resulting in a reduced separation requirement. However, this could not be applied to scenarios involving receiver antenna heights above the local clutter (for example MMDS interference into NGMB base stations)[36];*
- *Antenna radiation patterns with better off-axis signal suppression may improve the sharing feasibility for scenarios where requirements are not determined by on-beam interference entries; and*
- *Depending on the elevation radiation pattern, an antenna down tilting may also help to reduce required separations at the expense of a reduced coverage."*

[34] If it can be assumed that the NGMB BS receiver is the dominant factor and an NFD of 30 dB (decibel) is available, the distance from the edge of the MMDS coverage area is approximately 14.5km.

[35] A diagram of the existing plan of radio frequency channels is set out in Section 1.1 of Aegis and Plum's report

[36] Whilst NGMB base stations may be deployed at low levels to provide hot spot coverage there is no guarantee this will always be the normal case.

3.2.2 Overview of respondents' views

3.6 Comments were received from the following interested parties:

- Hutchison 3G Ireland Ltd ("H3GI");
- Telefónica O2 Ireland Ltd ("TO2");
- UPC Communications (Ireland) Ltd ("UPC"); and
- Vodafone Ireland Ltd ("Vodafone").

3.7 Of the four respondents who expressed a view on the technical analysis, two respondents (H3GI and TO2) expressed a view that they agreed with the findings of the report, one respondent (UPC) raised a number of specific concerns in relation to the technical analysis undertaken by Aegis and Plum, and one respondent (Vodafone) considered that some of the assumptions and calculations in the report may be overly conservative.

3.8 The two respondents (H3GI and TO2) who expressed a view that they agreed with the findings of the report did not provide reasons to support their view.One such respondent, H3GI, stated in its response:

- *"H3GI agrees with the approach of allocating 2.6 GHz spectrum using a technology and service neutral competitive process as outlined by Aegis and Plum. It shares ComReg's preliminary view that the potential case for sharing ultimately remains limited and that the benefits need to be balanced against the cost of conducting any necessary studies or implementing any practical interference mitigation techniques. H3GI agrees with ComReg's decision to refrain from conducting any further studies on sharing. "*

3.9 The principal concerns and observations expressed by UPC and Vodafone, the third and fourth respondents, in relation to the technical analysis carried out by Aegis and Plum, were as follows:

1. UPC raised a concern that the MMDS EIRP value of 32dBW/8MHz has been used for the coverage predictions which is the maximum level specified in the ComReg technical conditions for an analogue MMDS transmitter, when 22dBW/8MHz is the maximum permitted level for a digital MMDS transmitter.

2. UPC raised a concern over the use of the maximum permitted mobile station EIRP instead of the "more practical"[37] EIRP values.

3. UPC raised a concern over the "minimal"[38] analysis performed regarding micro and pico cells.

4. UPC raised a concern that the Aegis and Plum report did not state the assumed antenna heights in their micro and pico cell analysis.

5. UPC raised a concern that the Aegis and Plum's analysis appears to have assumed that the micro and pico antennas are pointing directly at the MMDS receiver when in reality micro cell antennas would have a large down tilt.

6. UPC raised a concern that the use of a net filter discrimination (NFD) value of 30dB was used without adequate explanation of its origin.

7. Vodafone noted that the Aegis and Plum study itself recognises that required separation distances for next generation mobile broadband with pico cell application will be much lower than those for base stations operating with an EIRP equal to the EC Decision limit.

8. Vodafone noted that the maximum allowed interference levels for base stations and user terminals used in the assessment, as detailed in Table 17 of section 5.1.2 of the Aegis and report (Document 11/80a), are very conservative, and while it may not be an ideal scenario, a mobile operator using these frequencies in urban areas would expect to tolerate interference levels considerably higher than the parameters used in the Aegis and Plum analysis.

3.2.3 Overview of Aegis and Plum's Response to its technical analysis and final position on same

3.10 Aegis and Plum was invited by ComReg to analyse and comment on the various submissions received in relation to its original report.

3.11 In this section, a summary of Aegis and Plum's main responses to respondents views (as summarised in 3.2.2 above) are set out. Interested parties should note that Aegis and Plum has prepared a separate response

[37] "more practical" is a quote from the Aegis and Plum report, published as 11/80a

[38] "minimal" is a quote from UPC's response document.

document which is being published alongside this response to consultation and further consultation (see Document 12/132b) and which sets out the views of Aegis and Plum in greater detail.

3.12 In summary, Aegis and Plum does not consider there to be any compelling reasons that would cause it to change either the content or move away from the approach it adopted in Document 11/80a and Aegis and Plum considers that the conclusions therein remain valid.

3.13 In response to the issue enumerated in point 1 above regarding the MMDS EIRP values used in the assessment, as raised by UPC, Aegis and Plum in table 16 on page 42 of document 11/80a sets out the range of values used for MMDS EIRP as 18-32dBW/8MHz. Further, Aegis and Plum in its response Document 12/132b points out that the analysis has used a typical MMDS transmitter EIRP of 18dBW/8MHz, as indicated in the following text from document 11/80a, page ES-1:

- *"For a typical MMDS transmitter (EIRP of 18 dBW/8 MHz and effective antenna height between 100 and 300 metres), the minimum required separation distances from the edge of MMDS coverage area into NGMB base station receivers are between 45.6 and 67.5 km (The UPC site data indicates that 17 out of 22 MMDS transmitters use EIRP of 18 & 19 dBW/8 MHz)."*

3.14 Aegis and Plum also refers to the following text from Section 2.2.3 of Document 11/80a:

- *"Scenarios of MMDS co-channel interference into NGMB BS receivers require the largest separation distances. The site data from the current MMDS licensee indicates that 17 out of 22 MMDS transmitters use an EIRP of 18 and 19 dBW/8 MHz. For an MMDS EIRP of 18 dBW/8 MHz, the minimum required separation distances from the edge of MMDS coverage area are between 45.6 and 67.5 km when an MMDS transmitter effective antenna height is assumed to be between 100 and 300 m",*

3.15 Aegis and Plum states in 12/132b that the above clearly shows that the study's conclusions are based on the most representative MMDS transmitter emission level.

3.16 In response to issues 2, 3 (raised by UPC) and issue 7(raised by Vodafone), Aegis and Plum states in Document 12/132b that the key determinant as to

whether sharing can be supported is the co-channel MMDS into NGMB base station receiver scenario. The main conclusion of the technical analysis in Document 11/80a as noted in the last paragraph on page ES-1 is repeated below:

- *"The technical analysis results indicate that co-channel sharing scenarios involving MMDS transmitters and NGMB base station receivers require larger separation distances than adjacent channel sharing scenarios. For a typical MMDS transmitter (EIRP of 18 dBW/8 MHz and effective antenna height between 100 and 300 metres), the minimum required separation distances from the edge of MMDS coverage area into NGMB base station receivers are between 45.6 and 67.5 km."*

3.17 Further in response to issues 3 and 7, relating to the assessment of micro and pico cell implementation, Aegis and Plum acknowledges that implementing micro and pico cells below the clutter will reduce the separation distances. Aegis and Plum states, however, that this option would place a significant constraint on any NGMB operator and may not be sufficient to avoid the need for detailed co-ordination with the MMDS operator.

3.18 Aegis and Plum also asserts that the analysis with terrain in the Dublin area shows that MMDS transmitters would still need to be turned off even when a 30dB mitigation factor is included in the calculations. This indicates that terrain and clutter effects would need to introduce in excess of 30dB additional loss for sharing to be feasible. Aegis and Plum states in its response document (page 7 of Document 12/132b):

- *"The analysis with terrain in the Dublin region as described in Document 11/80a, pages 15 -18 shows that MMDS transmitters need to be turned off even when considering the scenario where there is a 30 dB mitigation factor included which is indicated by the yellow contour in Figures 6, 7 and 8 at pages 16 and 17 in Document 11/80a. This indicates that terrain and clutter effects would need to introduce in excess of 30 dB additional loss for sharing to be feasible.*

- *Aegis and Plum affirm that sharing on a co-channel basis is not feasible in Dublin without detailed co-ordination between the NGMB and MMDS* operators."

3.19 In response to issue 4 raised by UPC in relation to the report not stating the assumed antenna heights in their micro and pico cell analysis, Aegis and Plum states in its response document (Document 12/132b):

- *"The UPC Communications (Ireland) Ltd. statement that the Document 11/80a does not specify the antenna heights used in the analysis is incorrect as the analysis takes account of antenna height differences. The MMDS receiver is assumed to be at 10 metres and the BS transmitter is assumed to be at 30 metres and these parameters are listed in Document 11/80a Table 16, page 42, and Table 17, page 44, respectively."*

3.20 In response to issue 5 raised by UPC in relation to Aegis and Plum's assumption that the micro and pico antennas are pointing directly at the MMDS receiver when in reality micro cell antennas would have a large down tilt, Aegis and Plum on page 8 of response document 12/132b clarifies this by stating that elevation patterns were used and were taken into the account:

- *"When calculating interference into the MMDS receiver, the implications of elevation patterns (given in Section 5.1.1 & 5.1.2) [of document 11/80a] are taken into consideration and accordingly antenna down-tilt is included in the calculations.*

3.21 Further, Aegis and Plum notes that the co-channel sharing scenario in Dublin completed with terrain data indicates that sharing is not possible with a relaxed interference criterion of up to 30dB:

- *"Most importantly, the analysis results with terrain data shown in Section 2.3 of Document 11/80a (Figures 6 - 10) indicate that the co-channel sharing in Dublin is not possible even when the interference criterion is relaxed by up to 30 dB (which may be attributed to various mitigation techniques including deployment constraints on NGMB networks).*

  From a practical deployment point of view this is not a surprising result given that the interference scenario involves a high power broadcasting transmitter (located well above the local terrain to maximise the potential coverage) operating co-channel with base stations of a cellular network which are to be deployed in the MMDS coverage area."

3.22 On issue 6, UPC seeks clarification regarding the origin of the net filter discrimination (NFD) value of 30dB being used in 11/80a. Aegis and Plum considers that the key issue is not the actual NFD levels that should be used but whether there is any potential for adjacent channel sharing. Aegis and Plum in response Document 12/132b, reference paragraph 3 on page ES-2 of document 11/80a:

- *"… if adjacent band operation is considered MMDS transmitters need to be moved to channels that are away from NGMB channels to provide adequate NFD levels . Under the current channel plans this is not feasible as all the channels are used [by MMDS] in the Dublin area."*

3.23 In relation to issue 6, Aegis and Plum in response Document 12/132b explains further the channel plans currently used in the 2.6GHz band and reaffirms its conclusions as follows:

- *"The actual channel plans for MMDS are shown in Figure 1 on page 2 of Document 11/80a and the channel plans for NGMB are shown in Figure 2 also on page 2 of Document 11/80a. It can be clearly seen that there is no potential for adjacent channel sharing based on these two channels plans as the MMDS channels utilise the majority of the 2.6 GHz band. Aegis and Plum still therefore affirm that adjacent channel sharing is not feasible as per the conclusions set out in Document 11/80a."*

3.24 In response to issue 8, raised by Vodafone, in relation to the maximum allowed interference levels for base stations and user terminals being very conservative, Aegis and Plum provides the following response:

- *"In Document 11/80a a value of -10 dB for I/N has been used as this is the approach widely used in sharing studies where there is no established criterion. It should be noted that the analysis of interference into the Dublin area, taking into account terrain, considers a 30 dB mitigation factor based on the interference threshold shown by the yellow contour in Figures 6-10 in Section 2.3 of Document 11/80a (pages 16 – 18). These figures demonstrate the impact of potential relaxation in the assumed criterion."*

3.2.3.1 Summary of Aegis and Plum's technical assessment

3.25 In summary, Aegis and Plum has addressed each of the concerns raised by interested parties in its response Document 12/132b published in tandem with this report and it does not consider there to be any compelling reasons that would cause it to change either the content or move away from the approach it adopted in document 11/80a. It considers that the conclusions in that document remain valid.

3.26 The three principal conclusions from document 11/80a, in evaluating the feasibility of sharing options specifically which relate to co-channel sharing, adjacent channel sharing and alternative channel plan options are as follows:

3.27 First, in relation to co-channel sharing, section 3.1.1 of document 11/80a states:

- *"The outcome of the sharing analysis demonstrates that co-channel sharing is mainly determined by interference from MMDS into NGMB base station receivers. Based on the typical MMDS transmitter EIRP, the minimum required separation distances from the edge of the MMDS coverage area into a NGMB base station receiver are calculated to be between 45.6 and 67.5 km. The requirement for such separation distances means that it is unlikely to be feasible for the two services to share on a co-channel basis as MMDS has virtually contiguous coverage across Ireland. Taking Dublin as a specific example, as discussed in section 2.3 above, these separation distances could potentially require five MMDS transmitters to be turned off if a NGMB network is to be deployed in Dublin. Further analysis with terrain data indicates that there would be significant interference from three MMDS transmitters (Mount Oriel, Naul and Dunmurry) into Dublin with limited impact from Ballyguile and no impact from Sleve Buoy. Whilst it might be possible to implement interference mitigation techniques (such as interfering transmitter EIRP reduction, use of opposite polarisations, improved antenna discrimination and antenna downtilting) each one would need to be assessed using practical deployment scenarios. Also to avoid the potential for interference it is likely there would be a need for detailed co-ordination between MMDS and NGMB. It is therefore concluded that co-channel sharing may not be a feasible option."*

3.28 Second, in relation to adjacent channel sharing pages section 3.1.2 of document 11/80a states:

- *"The technical analysis indicates that adjacent channel sharing is feasible with a separation distance of at least 15 km from the edge of the MMDS coverage area to the base station. However, the sharing potential of the two services is dependent on the NFD level which depends on the transmitter and receiver selectivity masks. It will be necessary for MMDS transmitters to be moved to channels away from NGMB channels to provide adequate NFD levels or for additional filtering to be added to minimise the size of guard bands and / or to minimise the separation distances. The option of moving to channels away from NGMB is not feasible as the current channel plan uses either all the odd channels or all the even channels at a given MMDS site. Therefore the only options for adjacent sharing will be to use a very limited number of TDD channels*

or for MMDS to deploy MPEG-4 to improve the compression and so reduce the spectrum required. This is discussed in the following section."

3.29 Third and in addition to the above views on alternative channel plan options, on pages 20 and 21 Aegis and Plum states:

- *"It might be feasible to move the radio frequency channels allocated to MMDS and release TDD spectrum as shown in Figure 13."*

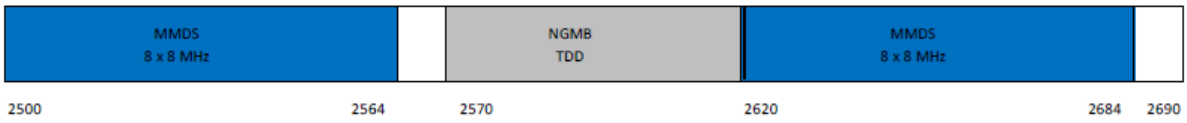

Figure 13: Example 2.6 GHz TDD Channel Plan with MMDS (MPEG-2)

- *There will, however, be a need for guard bands between MMDS and NGMB which will reduce the number of channels available for MMDS if the full 1 x 50 MHz of un-paired spectrum is to be released. Also to date in Europe there has been less interest in 2.6GHz TDD spectrum (footnote 7) and the release of FDD spectrum with 120 MHz duplex separation appears to be the most attractive option.*

  It is therefore concluded that adjacent channel sharing is probably not attractive without migrating MMDS to MPEG-4, as there would be a very limited amount of spectrum available for NGMB and it would only be suitable for TDD."

- *"Although deploying MPEG-4 will reduce the amount of spectrum needed by MMDS by about 50% while supporting the same programme material channels the investment in new set top boxes will not provide any, or only very limited, opportunities to provide high definition or further standard definition channels. It is therefore concluded that adjacent channel sharing based on migration to MPEG-4 may not be an attractive option."*

3.30 Aegis and Plum concludes in section 3.3 as follows:

- *"Based on the results of interference modelling and considerations of feasible channel plans, we conclude that the various sharing options may not be attractive. The economic analysis in the following section*

therefore focuses its attention on reallocation options as opposed to the co- or adjacent channel sharing options.

This is not to rule out co- or adjacent channel sharing, rather it points to the need for more detailed modelling of these options taking account of interference probabilities and realistic commercial deployment options in order to provide a basis for economic evaluation. However, such further technical and economic analysis might only be justified if there is real interest amongst stakeholders compared to the status quo or 2.6 GHz reallocation options."

3.3 ComReg's analysis and position

3.3.1 ComReg's view as per Document 11/80

3.31 ComReg set out its preliminary view on the feasibility of sharing the 2.6 GHz band between MMDS and NGMB services in the timeframe up to 2019 in section 3.2.1 of document 11/80, in particular as follows:

- *"Given the findings in relation to the feasibility of sharing the 2.6 GHz band outlined in the Report and summarised above, ComReg is of the preliminary view that the potential case for sharing ultimately remains limited. It is also of the preliminary view that the benefits, which could in principle arise, need to be balanced against the cost of conducting any necessary studies or implementing any practical interference mitigation techniques. Further, with the relatively short timeframe up until licence expiry in 2014 and possible extension to 2019, the window of opportunity for sharing would be small. ComReg therefore does not propose to conduct further studies on sharing."*

3.32 ComReg has since considered all of the submissions from interested parties in relation to the Aegis and Plum report and Aegis and Plum's response to same as set out in Document 12/132b. ComReg's assessment is set out in the following section.

3.3.2 ComReg's assessment and response

3.33 ComReg does not propose to repeat Aegis and Plum's assessment of respondents' views except to highlight the key points in assessing whether sharing of the 2.6 GHz band is a feasible option. ComReg considers that Aegis and Plum has carefully considered respondents' views and made a reasonable and comprehensive response, as set out in Document 12/132b.

Co-channel sharing

3.34 ComReg agrees with Aegis and Plum that the determining factor for co-channel sharing is the MMDS into NGMB Base station receiver scenario which requires the largest separation distances between the NGMB base station and the MMDS coverage edge (between 45.6 and 67.5km).39 The requirement for such separation distances means it would be unlikely to be feasible for the two services to share the band on a co-channel basis, as MMDS has virtually contiguous geographic coverage.[40] (Aegis and Plum's words).

3.35 UPC and Vodafone noted that micro and pico cells could be looked at in more detail. Aegis and Plum acknowledged that implementing micro and pico cells would reduce the separation distances but also noted that this would place a significant constraint on future NGMB operators and might still not be sufficient to avoid the need for detailed coordination with MMDS operators.

3.36 Further, Aegis and Plum highlights that the analysis with terrain in the Dublin area shows that MMDS transmitters would still need to be turned off even when a 30dB mitigation factor is included in the calculations. This indicates that clutter effects plus any other mitigation measures, such as implementing micro or pico cells, requires in excess of 30dB additional loss for sharing to be feasible.

3.37 Having considered the technical analysis set out in document 11/80a, the response Document 12/132b and in particular the above points, ComReg has formed the opinion that co-channel sharing in the 2.6 GHz band is unlikely to be feasible.

Adjacent channel sharing

3.38 Aegis and Plum in document 11/80a and Document 12/132b considers that the key issue in determining whether there is any potential for adjacent channel sharing is linked to the current channel plan for the 2.6GHz band (as shown in Figure 4.0 below) rather than the net filter discrimination (NFD) level chosen in the assessment.

[39] For an MMDS effective radiated power ("EIRP") of 18dBW/8 MHz the minimum separation distance distances from the edge of the MMDS coverage area are between 45.6 and 67.5km when an MMDS effective transmitter height is assumed to be between 100 and 300m.

[40] The phrase contiguous coverage is the nomenclature used by Aegis and Plum.

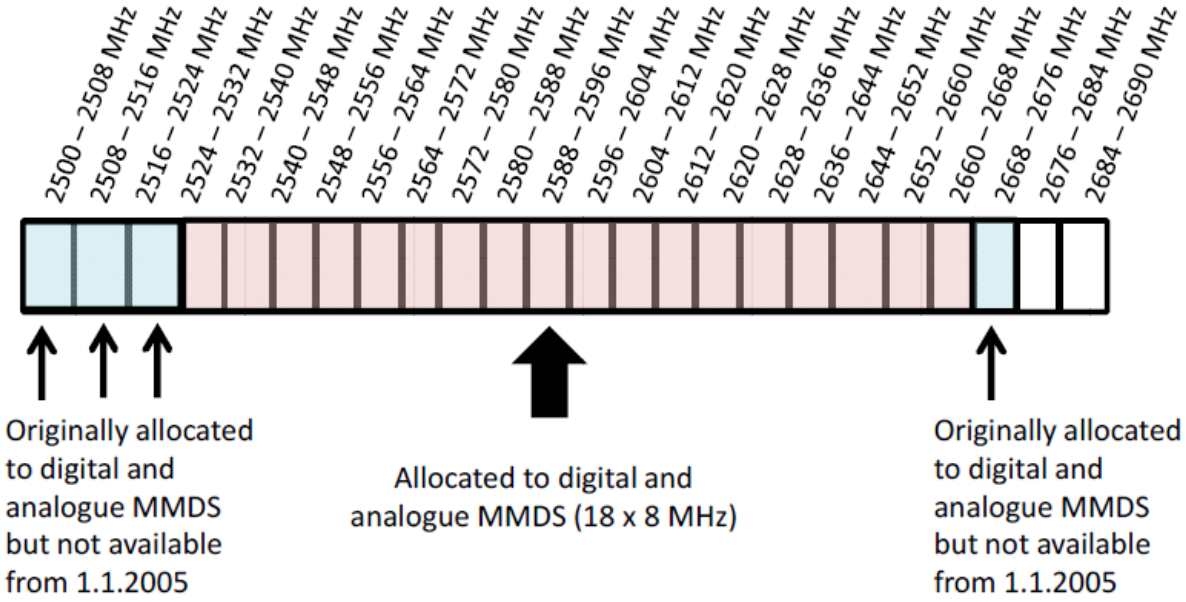

Figure 4.0 Channel plan considerations for deployment of MMDS and NGMB.

3.39 ComReg shares Aegis and Plum's views that it would be necessary for a frequency separation between the radio frequency channels used by MMDS transmitters and NGMB base stations to provide adequate NFD levels or for additional filtering to be added to minimise the size of guard bands and/or to minimise the separation distances. In this regard, the option of a frequency separation between the radio frequency channels used by MMDS transmitters and NGMB base stations would not be feasible as the current use of the band plan of radio frequency channels by the MMDS service uses all the odd channels or all the even channels at a given MMDS transmitter site. Therefore given the current channel plan, adjacent channel sharing is not a feasible option.

Alternative channel plans

3.40 In Annex B of document 11/80a, Aegis and Plum considered a variety of different channel plan options to investigate the potential for sharing between MMDS and NGMB. Having considered the feasibility of these channel plans, Aegis and Plum did not identify an alternative channel plan for sharing which would be attractive for both MMDS and NGMB operators. In considering the alternative channel plans as per document 11/80a, ComReg shares the Aegis and Plum view that it is unlikely that such plans would be either feasible or attractive for MMDS and NGMB operators

3.41 A summary of the results of the Aegis and Plum interference modelling scenarios, in respect of co-channel sharing, adjacent channel sharing and alternative channel plans are set out in paragraphs 3.27 to 3.30 above.

3.42 ComReg, in considering the responses from interested parties, notes that none of the respondents expressed a real interest in developing alternative 2.6GHz allocation options to facilitate MMDS and NGMB operation.

3.43 Further, it is noted that two respondents (H3GI and T02) expressed their view that they agreed with the findings of the Aegis and Plum report. One such respondent (Vodafone) noted that some of the parameters used by Aegis and Plum in its assessment may be overly conservative and that there may be some scope for limited shared use of the band. Aegis and Plum, however, in Document 12/132b, rationalised the use of these parameters and noted that further analysis in the Dublin area which introduced a 30dB mitigation factor, or relaxation of these parameters, still required MMDS transmitters to be turned off. Vodafone also expressed a view that it does not believe that facilitating shared use of the 2.6 GHz band between MMDS and mobile broadband, to the extent feasible, is a priority in current circumstances. Another respondent (UPC) raised a number of concerns with the content of the report, however, these concerns have been addressed by Aegis and Plumin its supplementary (Document 12/132b).

3.3.3 ComRegs final position

3.44 ComReg, has taken account of the following in generating its final position;

- Aegis and Plum's analysis of the future of the 2.6GHz band as per document 11/80a;
- The views expressed by the four respondents to documents 11/80 and 11/80a; and
- Aegis and Plum's responses to the views expressed by the four respondents to documents 11/80 and 11/80a, as set out in Document 12/132b.

3.45 ComReg, having considered the report of its consultants Aegis and Plum, and all of the submissions received, remains of the view that the case for co-channel or adjacent channel sharing in the 2.6GHz band, as between MMDS and other electronic communications services, is so limited for technical reasons as to not be feasible. This is particularly the case in light of the

relatively short timeframe remaining for the MMDS licences, as those licences will expire in April 2019 at the very latest while it is proposed herein that they be renewed for two years, meaning they would expire in April 2016. The potential benefits of channel sharing which could accrue in that narrow timeframe needs to be balanced against the cost and time taken to conduct necessary studies in order to implement sharing, and the practicalities of introducing methods to mitigate interference between different services in a shared 2.6GHz band. ComReg therefore, does not propose to implement a framework which will allow for sharing in the 2.6GHz band.

4 Timing of new 2.6 GHz spectrum usage rights

4.1 Introduction

4.1 In view of the conclusion in the previous chapter that the potential for sharing the 2.6GHz band between MMDS and NGMB is for technical reasons so limited as to not be feasible, ComReg believes that the possibility of renewing the current MMDS licences for a period of up to 5 years from April 2014 must be considered in the context of possible alternative uses of the 2.6GHz band.

4.2 In considering whether to renew the current MMDS licences, the crucial issue is the duration of any such renewal. In considering this issue, ComReg assesses and weighs the likely economic benefits of releasing 2.6GHz spectrum on a service and technology neutral basis with effect from April 2014, against delaying its release until some later date (for example up until April 2019).

4.3 In its analysis ComReg notes Aegis and Plum's study and its conclusion that the greatest economic benefits would be realised from releasing the band earlier as compared to delaying its release to 2019 (details of its study are set out in Document 11/80a).

4.4 In Document 11/80, ComReg asked the following question in relation to the Aegis and Plum recommendation, set out in Document 11/80a, that the 2.6 GHz band should be released on a service and technology neutral basis:

Q. 1	Please provide your views on the possible approach of allocating 2.6 GHz spectrum using a technology and service neutral competitive process as outlined by Aegis and Plum?

4.5 This chapter presents ComReg's assessment of, and response to, the views provided by interested parties to this question insofar as they relate to the non-technical aspects, which are addressed in Chapter 3.

4.2 Aegis and Plum's view on the future of the 2.6 GHz band

4.6 In Document 11/80a, Aegis and Plum assessed the incremental changes to the costs and benefits of different scenarios relative to a base case involving renewal of all ten MMDS licences from 2014 to 2019, followed by a competitive award process for the band on a service and technology neutral basis with effect from 2019.[41]

4.7 Two scenarios and a base case are identified in the Document 11/80a as follows:

- Base Case: Renew all MMDS licences up to 2019[42];
- Scenario 1: End all MMDS licences in 2014[43]; and
- Scenario 2: Renew all MMDS licences from 2014 to the midpoint between 2014 and 2019[44].

4.8 The net economic benefits of each scenario are evaluated against the base case of extending involving ending the MMDS licences in April 2019.

4.9 Aegis and Plum considers that there would be two key benefits (both private and public) associated with the 2.6 GHz band being put to alternative uses (i.e. used other than for MMDS):

[41] In its study, Aegis and Plum assumed that a competition could be held for the spectrum rights of use on a service and technology neutral basis. Merely for the purpose of analysis, it was assumed that the winner of the competition used the spectrum for mobile broadband or NGMB. Note also, Aegis and Plum did not conduct an economic analysis of sharing the band given the technical results of its sharing analysis (see also Chapter 3).

[42] This base case assumed that MMDS licences would not be renewed in their current form after 2019.

[43] This analysis scenario assumed that MMDS licences would not be renewed in their current form from 2014.

[44] This analysis scenario assumed that MMDS licences would remain in the band until the mid-point between 2014 and 2019. These results were compared to the results of scenario 1 relative to the base case. While the economic benefits of renewing the MMDS licences to midpoint between 2014 and 2019 are greater than those in renewing the MMDS licences to 2019, those benefits are less than if the licences were not renewed from 2014 at all.

- The avoidance of the costs of operating MMDS over the period 2014 to 2019; and

- The value of the 2.6 GHz spectrum band if it is used for NGMB to provide mobile broadband services rather than MMDS over the period 2014 to 2019[45].

4.10 Aegis and Plum also considers that the main costs (both private and public) associated with the 2.6 GHz band being used for alternative uses would be the costs of MMDS customers switching from MMDS to an alternative pay TV platform, and that the switching costs would depend on three factors, set out at page 34 of Document 11/80a:

- *"The volume of customers at the date of the switch (see Table 10);*

- *The cost of equipment (new set top boxes, satellite dish receiver and installation); and*

- *The value of customer time involved in making and implementing the switching decision."*

4.11 Aegis and Plum concludes that if MMDS licences end in 2014, this would offer significant net benefits relative to scenarios where MMDS licences were extended up to 2019.[46] In particular, Aegis and Plum estimates the net benefits of release of the band in 2014 to range from between €16.5 to €41.4m (figures quoted relative to delaying the release of the band until 2019). Similarly it notes the net benefits of delayed release of the band until the midpoint date of 2017 range from between €4.8 to €13.5m (relative to delaying the release of the band to 2019). In this connection, the earlier the band is released relative to 2019 the greater the likely net economic benefits.

4.12 At page ES-4 of the Executive Summary in Document 11/80a, Aegis and Plum highlights uncertainties involved in its assessment such as the future demand for mobile broadband and spectrum demand and for future prospects of MMDS. In relation to these uncertainties it highlights that one approach open to ComReg would be to consider allocating the 2.6 GHz

[45] ComReg notes that NGMB is taken as a proxy for any service capable of using the 2.6 GHz spectrum band. Aegis and Plum considers that in relation to NGMB, the relevant consideration is the cost of the service with and without 2.6 GHz spectrum and the benefits of this potential cost reduction are reflected via the value attributed to 2.6 GHz spectrum for NGMB use.

[46] Aegis and Plum also considered the benefits of realising the band in 2017 which

spectrum using a technology and service neutral competitive process. In the view of Aegis and Plum, such an approach would enable the market rather than ComReg to determine the most economically attractive use of the 2.6GHz spectrum band.

4.2.1 Overview of respondents' views

4.13 Comments were received from the following interested parties in response to the economic analysis set out in Document 11/80a.[47]:

- Eircom and Meteor Communications Ltd (the "eircom Group");
- Hutchison 3G Ireland Ltd ("H3GI");
- L.A. Services;
- Telefónica O2 Ireland Ltd ("TO2");
- UPC Communications (Ireland) Ltd ("UPC"); and
- Vodafone Ireland Ltd ("Vodafone").

4.14 Of the six respondents who express a view on the economic analysis, four (eircom Group, Vodafone, TO2 and H3GI) agree with the methodology and approach taken by Aegis and Plum and two (UPC and L.A. Services) do not. The respondents who agree with Aegis and Plum's analysis give the following main reasons:

4.15 eircom Group supports the methodology used by Aegis and Plum and agrees with Aegis and Plum's assertion that the two principal benefits associated with alternative uses of the band are (i) the avoidance of the costs of operating MMDS over the relevant period, and (ii) the value of 2.6 GHz spectrum if it is used to provide mobile broadband service rather than MMDS for the relevant period. eircom Group also supports the view that switching costs are the primary cost to be considered in the cost benefit analysis;

4.16 eircom Group also states: *"However, in reaching this conclusion Aegis and Plum appear not to consider in their calculation the consumer benefit created by the use of 2.6 GHz spectrum for NGMB, instead relying on the auction*

[47] Where a review or summary is provided, whether of previous ComReg Documents, respondents' submissions or expert reports reference should be made to the original documents for the definitive version thereof.

fees paid in recent auctions as a measure of the benefit generated by 2.6 GHz. eircom Group believes that if the consumer benefit of faster and cheaper mobile broadband is considered, the case to make 2.6 GHz available for NGMB beyond 2014 is even more compelling." ;

In addition, eircom Group claims that Aegis and Plum's analysis is likely to yield a conservative estimate of the benefits of using 2.6 GHz spectrum for NGMB because the analysis does not consider the benefit of faster and cheaper broadband services likely to arise.

4.17 Vodafone considers the cost-benefit analysis to be correct and to be comprehensive in its assessment of all the relevant impacts of the options considered.

4.18 Two of the other respondents, TO2 and H3GI, who agree with the economic analysis set out by Aegis and Plum do not provide reasons to support their views. H3GI claims that allocating 2.6 GHz spectrum using a service and technology neutral competitive approach as outlined by Aegis and Plum would be an acceptable approach given the findings of the Report.

4.19 The two respondents who disagree with Aegis and Plum's economic analysis provide the following principal reasons:

1. L.A. Services claims that Aegis and Plum does not take into account what the Irish consumer needs or wants and takes no account of qualitative issues. It claims that Aegis and Plum does not deal with the fact that if MMDS ceases there would be only one pay-TV provider for consumers;

2. Further, L.A. Services claims that while the Aegis and Plum report deals with the cost of changeover, it does not deal with the ongoing higher costs to customers associated with having the alternative pay TV service from BSksyB. It notes that at present call out costs and replacement parts for consumer equipment would be higher with satellite pay-TV than would be with the current MMDS operator;

3. UPC asserts that Aegis and Plum overstates the economic benefits of using 2.6 GHz spectrum for NGMB in the period between 2014 and 2019, because the assessment simply utilises a benchmark of auction prices achieved in 2.6 GHz auctions in other European countries, and significantly underestimates the cost to the Irish economy of the closure of UPC's MMDS service. UPC supports its assertion with the

findings of a separate analysis conducted for it by its consultants, which were set out in a document submitted in response to Documents 10/38 and 11/80.[48]

4.20 Some of the main arguments set out by UPC in its submission include:

4. The economic analysis conducted on behalf of UPC shows that the benefits of retaining the 2.6GHz radio spectrum band for MMDS far outweigh those that would accrue if it were re-assigned to NGMB, and it is claimed, this contrasts with the conclusions of the Document 11/80a;

5. Aegis and Plum's approach overestimates the value of the 2.6 GHz spectrum for NGMB in the period, as it based on using a benchmark of auction prices;

6. The costs to the Irish economy of ending the MMDS licences prior to 2019 are considerably underestimated. In particular, it is claimed that the Aegis and Plum study does not take into account the impact on MMDS subscriber numbers of the potential upgrade of UPC's network if licences are extended; and

7. There is considerable uncertainty over future demand for spectrum for the provision of mobile services and there are other spectrum bands which could deliver the economic benefits of mobile broadband.

4.2.2 Overview of Aegis and Plum's response and final position

4.21 Aegis and Plum analysed and commented on the respondents' views as summarised above and prepared a separate response document which is released alongside this Document (Document 12/132b). This Section sets out a summary of Aegis and Plum's views which are set out in detail in that separate document.

4.22 Aegis and Plum does not consider that any of the respondents presented information or an argument which would cause Aegis and Plum to move away from, or amend, any of its conclusions as set out in Document 11/80a and it considers that those conclusions remain valid.

[48] See Document 11/58s, in particular the report for UPC by Analysys Mason on "Maximising the benefits to Ireland of the 2500 – 2690 MHz spectrum band" May 2010

4.23 In relation to the view express by eircom Group that Aegis and Plum rely on the auction fees generated from recent auctions as a measure of the benefit generated by the 2.6 GHz band, and appear not to consider the consumer benefit created by the use of 2.6 GHz spectrum for NGMB, Aegis and Plum state as follows:

> *One would expect some of the benefit of 2.6 GHz spectrum in terms of faster and cheaper mobile broadband to be reflected in auction proceeds. However, eircom Group are correct in pointing out that an estimate based on auction receipts is likely to be a conservative estimate of the use of 2.6 GHz spectrum for NGMB. However, a conservative estimate of the value of spectrum for mobile broadband was sufficient, alongside other costs and benefits, to support a conclusion that reallocation would be efficient. Aegis and Plum did not therefore quantity the full value of additional benefits to consumers of faster and cheaper mobile broadband.*
>
> *In conclusion, as stated in Document 11/80a, the assessment based on auction proceeds is conservative:"We are of the view that none of the above three methods is likely to capture the full value associated with mobile broadband. Consumer benefits in terms of capacity and speed which are in addition to cost reduction benefits are not valued in our analysis. Therefore our approach to valuing the benefits of mobile broadband is conservative."*

4.24 Aegis and Plum notes Vodafone's comments (which support its approach to the economic cost benefit analysis) set out in point 3 above but provides no additional comment.

4.25 In relation to L.A. Services' claim that Aegis and Plum does not take into account what the Irish consumer needs or wants, and does not deal with the fact that if MMDS ceases there would be only one pay-TV provider for consumers (set out at point 4 above), Aegis and Plum states:

> *The Aegis and Plum report does not focus on the best technical use of the 2.6 GHz band, but on the value of alternative uses of the band to the Irish consumer (which reflect their wants and needs) taking into account technical constraints in relation to spectrum sharing. The report also discusses a number of issues in qualitative terms including the impact on competition in relation to TV and NGMB, the benefits of higher speed mobile broadband and possible external social benefits from improved mobile broadband.*

Aegis and Plum conclude in Document 11/80a that overall economic value, reflecting consumer needs, would be increased by reallocating spectrum from MMDS to NGMB. We also note that provided the spectrum allocation mechanism is a technology neutral auction the option of continued use of 2.6 GHz spectrum for MMDS would remain open as UPC would be able to bid for the spectrum.

At paragraph 3 on the page after page 30 (unnumbered) LA Services says: "It does not deal with the fact that if MMDS goes there is only one pay TV provider…"

The potential impact on competition in the TV market is highlighted and a comparison with concern about competition in other sectors, including the mobile sector, is also made. Aegis/Plum assessed the potential impact on competition in the TV markets and concluded that it would be likely to be negligible in the TV market given the small share of customers served by MMDS and national marketing and pricing of TV services.

However, in relation to the mobile data market the impact on competition is potentially greater as existing and anticipated spectrum excluding 2.6 GHz spectrum is insufficient to provide all operators with 2x20 MHz contiguous channels which would allow them to exploit the potential of LTE and all act as strong players in the market.

4.26 In relation to the claim by L.A. services, that the Report does not deal with the higher costs to customers associated with subscribing to an alternative satellite pay-TV service (from BSkyB) (out at point 5 above), Aegis and Plum states:

> *"On-going service costs <u>apply to both</u> MMDS and alternative platforms, irrespective of the contractual relationship which determines the incidence of costs between producers and consumers. Explicit consideration of services costs would not therefore be expected to alter the conclusions of the analysis in terms of overall producer and consumers surplus"* [emphasis added].

4.27 In relation to the claims by UPC that (1) Aegis and Plum overstates the economic benefits of using 2.6 GHz spectrum in the period and significantly underestimates the cost to the Irish economy of the early closure of UPC's MMDS service (set out at point 6 above), and (2) that the benefits of retaining the 2.6 GHz band for MMDS up to 2019 far outweighed those that would accrue if it were re-assigned for use to support the provision of NGMB

services (as set out at point 7 above), Aegis and Plum rejects these claims. Aegis and Plum contends, at page 20 of Document 12/132b, that UPC adopts *"…an incorrect approach to cost-benefit analysis…"* Aegis and Plum provides reasons to support its contention and these are also set out at page 20 therein (see also the next paragraph below).

> *The Aegis/Plum economic assessment is based on an assessment of the incremental benefits and costs of retaining 2.6 GHz spectrum for MMDS versus reallocation for NGMB. This is the correct approach to economic impact assessment. In contrast, in their response UPC*
>
> - *Counts the costs of running MMDS as a benefit of MMDS. This is not a valid approach to cost benefit analysis since costs are a cost rather than a benefit.*
>
> - *Does not consider the incremental costs and benefits of customers both alternatives, MMDS and NGMB, instead focussing on the incremental benefits of 2.6 GHz NGMB (in contrast to other frequencies such as 1800 MHz) and the full benefits of MMDS TV services (rather than the difference in benefits compared to alternative TV services). The correct approach is to compare incremental benefits of 2.6 GHz spectrum in relation to both MMDS and NGMB.*
>
> *In conclusion, the framework for analysis set out Sections 4.3 and 4.4 of Document 11/80a is sound. In contrast, the UPC opinion, supported by analysis by Analysys-Mason, adopts a different incorrect approach to economic cost-benefit assessment.*

4.28 In addition to the above assessment - which Aegis and Plum describes as the fundamental difference between the UPC opinion and the Aegis and Plum economic assessment - Aegis and Plum also addresses other comments by UPC on its economic analysis.

4.29 In relation to UPC's assertion (set out at point number 6 above) that the assessment by Aegis and Plum of the economic benefits of the 2.6 GHz spectrum if used for the provision of NGMB between 2014 and 2019 considerably overstates the economic value that would arise in practice, because the assessment simply utilises a benchmark of auction prices achieved in 2.6 GHz auctions in other European countries, Aegis and Plum states that there are three points to consider in relation to this argument:

1. Whether estimates based on auction proceeds overestimate or underestimate benefits of spectrum use for NGMB;

2. Whether there are clear differences between Ireland and other countries from which auction values are drawn that suggest values would be lower or higher in Ireland; and

3. There are likely to be competition benefits in the mobile broadband market from availability of additional contiguous spectrum to support multiple operators offering higher speed lower cost services that are not reflected in auction proceeds.

Aegis and Plum further states, in relation to the above points:

> ***"****In principle … we conclude that realised spectrum auction values provide a conservative estimate of the economic benefits of spectrum use for NGMB, as stated in the original Aegis and Plum analysis. In relation to the second point it is not obvious on a priori grounds that the value of NGMB will be lower in Ireland than in other countries. The Aegis and Plum analysis also considered more than one estimate of spectrum value, with the lower estimates based on econometric analysis by Dotecon of possible explanatory factors influencing spectrum value, with relevant variable values for Ireland substituted into the Dotecon equation."*
>
> *In relation to the third point, the benefits in terms of greater competition in the mobile broadband market (and the broadband market more generally) from having sufficient spectrum to support multiple operators with 2x20 MHz contiguous channels may be significant and will not be reflected in auction proceeds. We note that realistic expectations in terms of the availability of other spectrum including the 1800 MHz spectrum discussed by UPC would not offer substitute contiguous 20 MHz channels for all of the operators currently in the Irish market. We also note that in a number of other countries where LTE has been deployed at 1800 MHz it has also been deployed at 2.6 GHz, for example Finland.*
>
> *The conclusion of the Aegis and Plum analysis was robust to a low value for spectrum as a lower bound estimate of the value of NGMB. The conclusion in the Executive Summary of Document 11/80a stands, namely that "Overall we conclude that the benefits of early release of 2.6 GHz spectrum outweigh the costs under the range of assumptions (see section 4.9) we considered – some of which are judged to be conservative such as the benefits of mobile broadband."*

4.30 In relation to UPC's claims set out at point 8 above that Aegis and Plum's analysis overestimates the value of the 2.6 GHz spectrum for NGMB in the period as it based on using a benchmark of auction prices, Aegis and Plum responds as follows:

- *" …there are grounds for considering that auction proceeds may underestimate the economic value of NGMB. There are two reasons for this view.*

    - *Bidders know that they will not capture fully the benefits of faster services (due to the availability of wider contiguous spectrum channels with 2.6GHz spectrum) and lower costs (as spectrum can substitute for additional base stations and in-building solutions as point out by UPC on pages 9 and 10) as higher revenues since some of these benefits will ultimately accrue to consumers as lower prices and/or improved service at a given price…*

    - *Bidding may not be fully competitive and will not therefore reflect the full benefits that bidders do expect to capture." (see page 21 of Document 12/132b)*

- Realised spectrum auction values provide a conservative estimate of the economic benefits of spectrum use for NGMB. In particular, Aegis and Plum states that *"Bidders would not therefore be expected to bid for the full economic value of spectrum…"* (see page 21 of Document 12/132b); and

- More than one estimate of spectrum value was considered by Aegis and Plum hence it concludes that its analysis is robust to a low value for spectrum as a lower bound estimate of the value of NGMB.

4.31 In relation to UPC's assertion at point 9 above that the costs to the Irish economy of ending the MMDS licences prior to 2019 are considerably underestimated in the Report, is assessed by Aegis and Plum as follows (see pages 21, 22 and 23 of Document 12/132b):

UPC note that with investment in DVR boxes and with a more substantial investment in HDTV UPC could stabilise or grow the customer base respectively. We note that, whilst improving service quality would be expected to reduce the decline in customer numbers, doing so would involve a cost – investment – that may have a limited life assuming 2.6

GHz spectrum is reallocated in 2019 rather than 2014. There would also be time costs for customers in making the transition to a new UPC service, as there would for transition to an alternative service provider. We also note that customers can achieve higher service quality including HDTV by switching provider.

Taking the above factors into account, we would not expect consideration of a scenario in which customer numbers are higher to 2019 due to greater investment in enhancing MMDS service quality to make a material difference to the overall estimation of costs and benefits of reallocating 2.6 GHz spectrum for NGMB.

In relation to the argument regarding competition in the Irish TV market we reiterate the finding of the original Aegis/Plum study that given the small and declining number of customers on MMDS and national pricing of services (which face competition from cable outside MMDS areas), we would not expect the absence of MMDS services to have a material impact on competition in the TV market in Ireland. Further, as noted earlier, additional spectrum for NGMB would promote competition in the mobile broadband market and wider broadband access market.

In relation to jobs, both TV services and NGMB support jobs. In terms of both the quantity and quality of jobs in Ireland the option in terms of spectrum use that maximises overall economic benefit is likely to be the one that offers the greatest benefit in terms of economic welfare for people in Ireland – including employment prospects.[49]

In relation to the expenditure incurred by UPC Aegis/Plum correctly consider a reduction in such expenditure to be a benefit if spectrum were reallocated. It is wrong to argue, as UPC does, that expenditure is a benefit rather than a cost for the purposes of impact assessment.

UPC also notes that no account is taken of wider societal benefits of MMDS service. The Aegis/Plum study noted that "we make the simplifying and conservative assumption that the incremental external

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"[49] *Illustrative of the economic and employment potential of mobile devices and applications is the April 2012 announcement by Apple (predominantly a mobile device and service company) to employ an additional 500 people in Cork. We note that this expansion does not relate to the development of mobile services in Ireland per se, but to the expansion of a support base for the wider European market. Nevertheless it illustrates the opportunities been created in relation to mobile. http://www.irishtimes.com/newspaper/finance/2012/0421/1224315008559.html" (Aegis and Plum Document)*

social value from additional spectrum for mobile broadband is zero, relative MMDS."

Given the diverse and growing applications of mobile broadband we expect that relative to MMDS it will over time offer greater external benefits. However, given the uncertainty involved in assessing such benefits, for MMDS or NGMB, we felt a qualitative conclusion in relation to the relative magnitude of such benefits was appropriate.

Finally, we note that the number of MMDS customers has continued to decline. At the time of the Aegis/Plum study the latest available estimate was 66,900 for Q3 2010. A more recent estimate for 31 December 2011 from UPC puts the number at 55,100[50] out of a total of 1,584,000 TV homes in Ireland.[51] As the number of MMDS customers declines the costs of switching the remaining customers to alternative platforms declines and any net benefits that might be attributed to continued MMDS provision decline.

UPC also make additional comments in relation to the price of alternative services, the number of hours required to migrate to a new platform and services costs.

In relation to the price of alternative services we note that migration is on-going with falling customer numbers on MMDS. Therefore those who are migrating consider that the benefits of migrating – net of any price difference - exceed the costs of migrating. We take this into account in our modelling by assuming that the average cost net of differences in net benefits of migrating is half way between zero and the cost of migrating i.e. the average forced migration would involve a cost greater than zero but less than the switching cost since they would derive a net benefit from switching.

In relation to the number of hours required to migrate UPC propose that at least 5 hours is more realistic than our assumption of 2 hours. The Aegis/Plum study included sensitivity analysis, including sensitivity analysis of assuming that migration involves 5 hours of consumer time (which we consider to be on the high side). It was found that this had very little impact on estimated net benefits. We note that if migration times are higher they may also be higher for consumers adopting an upgraded

[50] http://www.lgi.com/pdf/UPC-Holding-BV-2011-RESULTS.pdf

[51] http://www.comreg.ie/_fileupload/publications/ComReg1220.pdf

MMDS service which would reduce the net benefits of a service upgrade, for example, to HDTV.

In relation to services costs we note that these apply to both MMDS and alternative platforms, irrespective of the contractual relationship which determines the incidence of costs between producers and consumers. Explicit consideration of services costs would not therefore be expected to alter the conclusions of the analysis in terms of overall producer and consumer surplus.

- The above analysis by Aegis and Plum, which ComReg considers to be correct, can be summarised as follows: First, Aegis and Plum does not consider a scenario where customer numbers would be higher in 2019 due to greater investment in enhancing MMDS service quality to make a material difference to the overall estimation of costs and benefits of reallocating 2.6 GHz spectrum for NGMB;

- Second, in relation to jobs, both TV services and NGMB support jobs. Aegis and Plum considers that the spectrum use that maximises the overall economic benefit is *"…likely to be the one that offers the greatest benefit in terms of economic welfare for people in Ireland – including employment prospects…"*; and

- Third, given the uncertainty in assessing the wider societal benefits of MMDS (or NGMB) services, Aegis and Plum takes a qualitative approach to consider this matter (see Section 4.11 of the Document 11/80a) but notes, however, that the number of MMDS customers continues to decline. As a result, it notes that with this continuing decline, the costs of switching the remaining customers to alternative platforms declines and any (net) benefits that might be attributed to continued MMDS provision also declines.

4.32 In relation to UPC's assertion at point 10 above that there is considerable uncertainty over future demand for spectrum for the provision of mobile services and that there are other spectrum bands which could deliver the economic benefits of mobile broadband in the period, Aegis and Plum states:

There is considerable uncertainty over demand, however, LTE tends to be deployed at 2.6 GHz where 2.6 GHz spectrum is available, so whilst there is uncertainty over the level of spectrum demand there is strong evidence of demand. In addition, future demand uncertainty is likely to increase rather than decrease the value of 2.6 GHz spectrum for NGMB today.

> *The reason for this is that demand may turn out lower or higher than anticipated, and the option of utilising additional spectrum should demand turn out to be high is valuable. If 2.6 GHz were not made available in 2014 then the option of utilising it for NGMB between 2014 and 2019 would not be available i.e. there is a foregone option value that is greater if there is considerable uncertainty.*

And later, in Section 6.4.5, Aegis and Plum states:

> *In relation to demand between 2014 and 2019 we first reiterate that where available deployment at 2.6 GHz tends to occur quickly – in other words there is demand in the near term. Further, far from having most value closer to 2019, constraints on re-farming of other mobile spectrum in the near term may imply a higher value early in the period than later (if mobile data demand continues to grow post 2019 then demand would ultimately increase again). We do not therefore accept the argument that the value of 2.6 GHz in Ireland will be greatest post 2019 rather than in the nearer term.*
>
> *In relation to mobile data growth we note that the most recent Cisco mobile data forecast published in February 2012 showed that growth over the previous year had exceeded the previous forecast marginally at 133% versus 130% respectively.[52] To 2016 Cisco forecast a compound average growth rate of 56%, above the upper end of the range of forecasts mentioned by UPC. LTE, given the higher level of service quality and lower cost per GB of data carried, is expected to stimulate demand.*
>
> *Whilst a precise forecast is impossible very high levels of data growth are plausible,[53] and more spectrum will lower the costs of meeting such demand.*
>
> *Finally, in relation to demand for 2.6 GHz spectrum for NGMB, we note that if it turns out that mobile operators do not value the spectrum sufficiently highly UPC could retain the spectrum by bidding for it at auction.*

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52 http://www.cisco.com/en/US/solutions/collateral/ns341/ns525/ns537/ns705/ns827/white_paper_c11-520862.html

53 http://www.plumconsulting.co.uk/pdfs/Plum_Insight_Jan2011_Mobile_data_growth_-_too_much_of_a_good_thing.pdf

4.3 ComReg's assessment and response

4.33 ComReg does not propose to further repeat Aegis and Plum's assessment of respondents' views save to the extent that it wishes to highlight key points made by it. ComReg has fully considered all of the respondents' views and Aegis and Plum's assessment of same as set out in Document 12/132b. ComReg considers Aegis and Plum's assessment of the submitted views to be reasonable and ComReg agrees with that assessment, including the overall conclusion

'Overall we conclude that the benefits of early release of 2.6 GHz spectrum outweigh the costs under the range of assumptions (see section 4.9) we considered – some of which are judged to be conservative such as the benefits of mobile broadband' (at page 28 of Document 12/132b).

4.34 ComReg agrees with eircom Group and Vodafone that the methodology and approach taken by Aegis and Plum is correct (see the claims enumerated at points 1,2 and 3 above).

4.35 ComReg also notes that Aegis and Plum's conservative assumptions are likely to yield a lower range estimate of the benefits of using 2.6 GHz spectrum for NGMB. In summary, ComReg believes that:

- The bandwidth of the 2.6 GHz band, which is 190 MHz in total, could support multiple operators having access to large allocations of spectrum. For example, one of the key features of the 2.6 GHz spectrum band is that it can support a 2 x 70 MHz frequency division duplex ("FDD2) allocation and a 50 MHz time division duplex ("TDD") allocation. Therefore there is considerable scope for multiple operators to obtain large spectrum bandwidths. Making available large spectrum bandwidths is considered to be strategically important as such releases can support substantial capacities (e.g. up to +150MBps) for data transmission.

- In light of these potential large spectrum bandwidth allocations, there are likely to be additional benefits in terms of range/type and quality of services for consumers. Such allocations support greater data transfer capacities and as a result the number of active users per coverage cell may be increased and/or latency in the data networks may be decreased. There are clear economies of scale benefits in terms of the availability of equipment for mobile broadband in the harmonised 2.6 GHz band as is evident by the number of mobile broadband deployments in this band throughout Europe (see paragraph 4.43 below).

4.36 ComReg addresses L.A. Services' claims set out at points 4 and 5 above, in relation to impacts on consumers, in its draft Regulatory Impact Assessment ("RIA") in Annex 2.

4.37 In relation to UPC's claims set out at points 7 to 10 above ComReg agrees with Aegis and Plum's assessment and response to same. ComReg believes that releasing the spectrum by means of a service and technology neutral competitive process will mean that it should be acquired by those operators who value it most. This would provide an opportunity for all operators to bid for rights of use of spectrum in the 2.6 GHz band and for the successful bidders to distribute television services, if they so wished or any other service consistent with rights of use to spectrum on a service and technology neutral basis.

4.4 ComReg's position on timing of new 2.6 GHz spectrum usage rights

4.38 Having considered interested parties' views and Aegis and Plum's assessment and response in relation its assessment of the incremental changes to the costs and benefits of different scenarios relative to a base case involving renewal of all ten MMDS licences from 2014 to 2019, followed by a competitive award process for the band on a service and technology neutral basis with effect from 2019, ComReg considers there is a case for making new rights of use to 2.6 GHz spectrum available soonest.

4.39 In particular, ComReg notes Aegis and Plum's assessment of scenarios (set out in section 4.1 above) that the better option, from a national economic perspective, would be to release the 2.6 GHz band on a service and technology neutral basis as early as possible. In particular it notes Aegis and Plum estimates the net economic benefits to the Irish economy ranging between €16.8 to €41.5 million for a release of the band in 2014 as compared to scenarios where that release were delayed (financial figures are quoted relative to delaying the release of the band until 2019 i.e. the base case.) [54] There are, however, practical considerations in relation to the timing of releasing the band which are set out section 5.4 below.

[54] Aegis and Plum estimates that the net economic benefits to the Irish economy ranging between €5.1 to €13.8 million for a release of the band in 2017 (figure quoted relative to the base case of release in 2019), which is less than if that release could occur earlier but more than if the release was delayed to 2019. This suggests to ComReg that the earlier the band is released the likely the greater the net economic benefits from a national perspective.

4.40 ComReg does not support UPC's main arguments and claims against holding a competitive process for new rights of use to 2.6 GHz spectrum in 2014 for a number of reasons:

- A decision to renew the MMDS licences for two years, as proposed herein, would inconvenience some MMDS subscribers to some extent in that those subscribers who might have remained on the MMDS platform until 18 April 2019 (the outermost limit of the licences) would instead have to switch to an alternative service provider three years earlier (i.e. by 18 April 2016 where the reasons for this particular date are set out in section 5.4). However, this moderate impact upon a relatively small number of users must be weighed against other considerations, including the fact that the properties of the 2.6 GHz spectrum band are such that it can be used to provide a range of electronic communications services for the benefit of Irish consumers, beyond MMDS.

- ComReg does not consider that that the number of MMDS subscribers who would be affected by a two year licence renewal (currently less than 5% of the overall number of pay TV viewers in the State and about 3% of TV households overall, and falling) is of sufficient magnitude to affect the competitive dynamic in the pay TV market to the extent UPC claims (see also Annex 2.0 ComReg's Regulatory Impact Assessment, which considers *inter alia* impacts on consumers);

- Consumers of multi-channel TV services are moving away from MMDS services demonstrating consumer preference for 'other' TV viewing options. This could be considered characteristic of an underlying consumer trend. Currently there are 47,900 subscribers and this represents an annual decline of 17% between the periods Q3 2011 and Q3 2012. If licences were renewed ComReg has no reason to believe that a decline in the number of MMDS subscribers would not continue. However, ComReg notes that renewing the licences serves to defer the necessity for current MMDS consumers to find a new TV source;

- UPC's arguments appear to be based on the expectation that mobile network operators would participate and 'win' new rights of use to 2.6 GHz spectrum in the proposed competitive process. It is not clear how UPC could hold this view with any certainty, particularly as it seems to run contrary to points made elsewhere in its submission. For example, one of the main arguments used by UPC is based on the following premise, which is set out page 8 of UPC's non-confidential submission

"…without availing of the 2.6 GHz band mobile phone operators have a number of means to meet increasing capacity demands…". In particular, UPC claims that mobile operators could employ new technology such as HSPA+ in their existing broadband spectrum at 2100 MHz, acquire more base stations, deploy more in-building solutions where capacity is required (e.g. femto-cells) and deploy spectrally efficient technologies in those frequency bands. In those circumstances, UPC seems to suggest mobile operators have sufficient alternatives to cope with future capacity constraints and therefore, would not need additional new rights to 2.6 GHz spectrum. It seems to ComReg that if this were the case, and assuming the award process enables those bidders who value using the spectrum the most to win, then UPC stands no less chance of winning those rights in 2014 than at a later date;

4.41 ComReg considers that it should make new rights of use to 2.6 GHz spectrum available as soon as practicable, subject to the identified constraints as set out in section 5.4. Reasons informing ComReg's view include:

- Information currently available to ComReg does not lead it to believe that the future of this spectrum band is one that should be confined to the existing spectrum usage rights. Instead ComReg believes that broadening the usage rights is more appropriate and that the sooner this can be achieved the greater the national economic benefits will be. ComReg also considers that it would be appropriate to enable the market to determine the uses of the band sooner rather than later;

- Awards of the 2.6 GHz band internationally demonstrate a strong leaning towards allocating spectrum usage rights on a service and technology neutral basis; and

- Recent evidence suggests potential demand for additional capacity spectrum bands in the State (e.g. demand in the recently completed Multi-band Spectrum Award ("MBSA").

4.42 Whilst the first point is dealt with extensively throughout this paper, additional detail in relation to the latter two points is set out below.

Awards and uses of 2.6GHz spectrum rights in a selection of countries

4.43 MMDS services using 2.6GHz spectrum rights is becoming less and less prevalent, particularly following the global harmonisation of the 2.6 GHz

spectrum band for International Mobile Telecommunications ("IMT") services such as Long Term Evolution ("LTE").[55] Lithuania and Ireland are the only two European countries which still have MMDS allocations in the 2.6 GHz band. In Lithuania, MMDS licences in the 2.6 GHz band expire on the 1st January 2015 and ComReg understands that the 2.6 GHz spectrum will not be used for MMDS in the future. ComReg understands that rights of use to 2.3 GHz spectrum may be made available in Lithuania for MMDS from 2015. ComReg notes however, that the Lithuanian MMDS services are currently accommodated (including the necessary guard bands) in a 50 MHz bandwidth in the centre of the 2.6 Hz band of spectrum and that unlike in Ireland, sharing is not a constraining issue.

4.44 ComReg considers that there is a trend internationally towards reallocating the 2.6GHz spectrum band so that it can be used for IMT. In particular ComReg notes:

- Norway was the first European country to auction rights of use to 2.6 GHz spectrum in 2007, followed by Sweden in 2008, Finland in November 2009, Denmark, Netherlands and Germany in 2010. [56] ComReg understands these awards were based on a service and technology neutrality principles in line with the European Commission Decision 2008/447/EC; and

- Of particular interest in the context of LTE use of the 2.6 GHz spectrum band is Ofcom's plan to award rights of use to spectrum jointly between the 2.6GHz and 800 MHz spectrum bands has been brought forward.[57]

4.45 Outside of Europe there is a similar trend toward the use of the 2.6GHz spectrum band for IMT services.[58] In relation to other possible uses for this band of frequencies, ComReg notes the following:

[55] Brazil, Slovak Republic, Latvia, Colombia, Mexico have all recently released or are in the process of releasing 2.6GHz spectrum previously allocated for MMDS use for the provision of IMT. At this time there are several MMDS service providers in the Czech Republic in the 2.3 GHz band. The period of validity of an individual authorization for MMDS is 5 years.

[56] Many other EC countries have now also followed suit and awarded rights of use to 2.6 GHz spectrum including: Austria, Belgium, Estonia, Finland, France, Italy, Latvia, Portugal, Spain, Latvia, Switzerland. ComReg notes the Czech Republic, Poland, Slovak Republic are currently preparing awards.

[57] http://stakeholders.ofcom.org.uk/consultations/award-800mhz-2.6ghz/statement/

[58] Hong Kong, Brazil, Chile Sinapore. ComReg notes that Australia, Canada, Coloumbia are currently preparing awards.

- The 2.6 GHz band in Australia is currently allocated for electronic news gathering ("ENG") but there are plans to re-farm the band and auction the remaining spectrum for the provision of IMT services;[59]

- In the USA the band is in use for Broadband Radio Service ("BRS") and Educational Broadband Service ("EBS"). This band was previously used for the broadcasting of data and video services but has since evolved to include availability of broadband services including portable and mobile services; and

- The Canadian communications authority, Industry Canada, has initiated an auction process of the "2500MHz band" (2500-2690MHz) to transition the band to Broadband Radio Service (BRS) licenses with a band plan based on the ITU option 1 plan. [60]

4.46 In summary by the end of July 2012, the majority of launches of LTE networks had been in the 2.6GHz band with more than 40 deployments worldwide.[61]

Evidence of demand for capacity bands in the State

4.47 At Section 5.3 in its non-confidential submission to Document 10/38, UPC sets out its views in relation to demand for spectrum in various frequency bands. In particular UPC states that:

- *"… In short, therefore, UPC considers that there are many spectrum opportunities which will present themselves well before 2014 for the enhancement of mobile networks…"* (page 30 of its non-confidential submission)

4.48 ComReg notes that there was demand during its Multi Band Spectrum Award ("MBSA") for rights of use to spectrum in the 1800 MHz spectrum band, which, similar to the 2.6 GHz spectrum band, is primarily a capacity band.[62]

[59] http://www.acma.gov.au/webwr/_assets/main/lib410252/ifc26-2012-review_of_2.5ghz_band_and_eng.pdf

[60] http://www.ic.gc.ca/eic/site/smt-gst.nsf/vwapj/700MHz-e.pdf/$file/700MHz-e.pdf

[61] Consolidation around core bands although many in use for LTE, by Michael Newlands, Policy Tracker, August 01, 2012

[62] While the 1800 MHz and 2.6GHz spectrum bands share capacity like characteristics, the bands differ in terms of coverage capabilities with the 1800 MHz spectrum band having superior coverage.

4.49 In that particular award 15 blocks of 2 x 5 MHz spectrum rights of use to 1800 MHz spectrum were made available up to mid 2030, all of which were awarded in the process.

4.50 In light of the above, it seems to ComReg it would be appropriate to offer new rights soon as it would also ensure an efficient spectrum use by allocating the rights to the operators that would value them the most.

5 Consultation Issue

5.1 Introduction

5.1 This chapter considers the timing of when ComReg should make new rights of use to 2.6 GHz spectrum available. In doing this, ComReg conducts and prepares a draft RIA (at Annex 2) based on the analytical framework set out in ComReg's RIA Guidelines.[63]

5.2 In addition, to the extent not already considered in the draft RIA, ComReg assesses its preferred option against other statutory objectives, criteria and/or relevant Policy Directions issued to ComReg by the Minister for Communications, Energy and Natural Resources under Section 13 of the 2002 Act (as amended) (the "Policy Directions").

5.3 On balance, ComReg believes that it would be technically and economically preferable to release the band on a service and technology basis as early as possible but that, as the process is likely to take some time, it would be appropriate to renew the existing MMDS licences under the 2003 Regulations for a period of 2 years, after which the licences and the corresponding spectrum rights of use would expire altogether and new rights of use to 2.6 GHz spectrum would be made available on a service and technology neutral basis. The reasons and objective justification for this proposal are set out below.

5.4 In summary, ComReg's proposal includes a Draft Decision to **renew the existing ten MMDS licences from 19 April 2014 to 18 April 2016** after which they would expire altogether. ComReg believes this will facilitate sufficient time for it to conduct an open, transparent and non-discriminatory

[63] Guidelines on ComReg's approach to Regulatory Impact Assessment, August 2007, ComReg Document 07/56a.

process associated with making new rights of use to 2.6 GHz spectrum available in line its preferred option.

5.5 ComReg seeks views from interested parties on the consultation issue set out in this chapter.

5.2 ComReg's proposal on timing of new rights of use to 2.6 GHz spectrum: April 2016

5.6 For the reasons set out in the preceding Chapters, and including the analysis set out in Document 11/80a and considering all other relevant material before it, ComReg believes that there is merit in holding a service and technology neutral competitive process for new rights of use to 2.6 GHz spectrum as soon as practicable.

5.7 In particular, ComReg notes that the better option, from a national economic perspective, would be to release the 2.6 GHz band on a service and technology neutral basis as early as possible. In particular it notes Aegis and Plum estimates the net economic benefits to the Irish economy ranging between €16.8 to €41.5 million for a release of the band in 2014 as compared to scenarios where that release were delayed (financial figures are quoted relative to delaying the release of the band until 2019 i.e. the base case.) [64] The supporting documentation in relation to the calculation of the estimated net benefits is set out in Document 11/80a.

5.8 Further documentation supporting ComReg's current position on holding a service and technology neutral competitive process soonest is set out in the draft RIA provided at Annex 2, which should be read in conjunction with this Chapter. Given the substantial volume of material assessed in the draft RIA, covering voluminous material submitted by respondents to both Document 10/38 and 11/80, ComReg sets out a summary of its detailed draft RIA assessments in the following subsection of this Chapter. In short, ComReg

[64] Aegis and Plum estimates that the net economic benefits to the Irish economy ranging between €5.1 to €13.8 million for a release of the band in 2017 (figure quoted relative to the base case and on spectrum used for NGMB), which is less than if that release could occur earlier but more than if the release was delayed to 2019. This suggests to ComReg that the earlier the band is released the likely the greater the net economic benefits from a national perspective. Given uncertainties Aegis and Plum note that one option available to ComReg would be to consider allocating 2.6 GHz spectrum using a technology neutral competitive process, allowing bids for both NGMB and MMDS use as this option would enable the market rather than ComReg to determine the use of the 2.6 GHz spectrum.

finds that the draft RIA supports the principle of making new rights of use to the 2.6 GHz spectrum available soonest.

5.9 While ComReg sees merit in this principle, an issue for it to consider is whether new rights of use to 2.6 GHz spectrum could in practice commence at the expiry of the existing licences in 2014, and if so, how ComReg could issue such rights in accordance with its statutory functions, objectives and duties.

5.10 In this regard, ComReg identifies several procedural matters that would, in practice, affect the earliest possible timing of the commencement of new rights of use to 2.6 GHz spectrum.[65] ComReg considers that it would not be possible for new rights to commence directly at the expiry of the existing licences in 2014. It believes, however, that it would be possible for new spectrum rights to commence in **April 2016,** and a discussion of the issues presented is set out at Section 5.4 below.

5.3 Summary of Draft regulatory impact assessment ("RIA")

5.11 ComReg publishes a draft RIA at Annex 2. The options under consideration in this draft RIA differ purely on the principle of renewing or not the existing MMDS licences and are as follows:

- Option 1: All MMDS licences **terminate in April 2014**, with no renewal granted (i.e. the band would be available on a service and technology neutral basis from 2014 onwards); and

- Option 2: All MMDS licences **are renewed**. It should be noted that ComReg has discretion to renew licences for any period from 19 April 2014 up to 2019. If licences were to be renewed (i.e. if Option 2 were found to be the preferred option), the crucial issue would be the duration of any such renewal.

5.12 In order to assess the options relative to each other, ComReg takes account of the conclusions reached by Aegis and Plum in its scenario assessment of the incremental changes to the costs and benefits of different scenarios

[65] In summary ComReg identifies the following main matters affecting the earliest possible commencement of new rights of use to 2.6 GHz spectrum:

- Achieving a practical timetable for awarding new rights of use to 2.6GHz spectrum, consulting and settling on same; and
- Conducting the competitive award process itself.

relative to a base case involving renewal of all ten MMDS licences from 2014 to 2019. In this regard ComReg compares a potential renewal of the MMDS licences from 2014 to a later termination date such as the mid-point between 2014 and 2019 as it mirrors Aegis and Plum's timeframes set out in its scenario assessment. ComReg notes that if Option 2 were to be the preferred option that further consideration of the potential duration of any renewal may be required as what is now essentially considered is the case for renewal from 2014 or not.

5.3.1 Overview of assessment of stakeholder impacts

5.13 ComReg's decision in relation to the above options will impact on the following stakeholders (noting that impacts on consumers are dealt with in a separate section 5.3.3 below based on the logic that impacts on stakeholders and competition flow into the impacts on consumers):

a) The current incumbent in the 2.6GHz spectrum band (i.e. UPC, which is the only licensee in the band and the sole provider of pay-TV services using the MMDS licences);

b) Organisations claiming to rely directly or indirectly on the ongoing provision of MMDS (for example, TV broadcasters and ancillary / supporting services);

c) Other existing and / or new entrants to the pay-TV market (for example, BSkyB is currently UPC's main competitor); and

d) Other potential alternative users of the band (for example, providers of mobile broadband (NGMB) services).

5.14 ComReg's detailed assessment of these impacts (and other impacts on competition and consumers) is set out in detail at Annex 2 and summarised in this chapter.

5.15 Some of the principal issues considered include whether there would be a negative impact on the Irish economy[66] and whether significant portions of the 2.6 GHz spectrum band might remain unused were new rights of use to 2.6 GHz spectrum made available given certain repsondents' claims that

[66] In particular two respondents', UPC and the Limerick Chamber of Commerce, claim that the Irish economy would be negatively impacted by at least €129 million and that there would be a reduction in VAT receipts generated by the MMDS service. See also the enumerated points 1,2,3,4 and 5 at paragraph A2.27 in Annex 2

MMDS services *"relies entirely on the ability to retain access to existing spectrum…[and] the rollout of mobile broadband services is in no way contingent on the availability of spectrum within this band…"*[67].

5.16 On balance, ComReg believes that Option 1 is more favourable than Option 2 and the reasons informing this view include Aegis and Plum's conclusions on same, the level of the ongoing migration of customers away from the MMDS platform, the availability of alternative pay and free TV services, and the potential demand for access to spectrum to support the growth in demand for data from mobile broadband services[68]. In making this assessment, ComReg is mindful of the need to balance the overall requirements of the electronic communications sector.

5.3.2 Overview of assessment of competition impacts

5.17 In summary, ComReg considers the impact on competition to be similar for both options except that these impacts are deferred in the case of Option 2.

5.18 The likely impacts on the following two markets are set out at Annex2:

a) The pay-TV market; and

b) Markets for potential alternative uses for the 2.6GHz band.

5.19 In relation to the pay-TV market, ComReg makes several observations summarised as follows:

- The number of MMDS subscribers is not of sufficient magnitude to have any significant affect on the competitive dynamic in the pay-TV market, as competition is mainly driven by the cable and satellite interactions (i.e. via UPC's cable network competing against BSkyB's pay-TV satellite network).[69]

- Added to this mix is the growing impact of DTT and free-to-view satellite TV which dampens the argument that the existence of MMDS acts as a competitive constraint in the multi-channel pay-TV market;

[67] For a discussion of the issues presented, see the enumerated points 6, 7 and 8 at paragraph A2.30 in Annex 2.

[68] ComReg notes significant increases in non-business user uploads/downloads (in both post and pre-paid) in GB per month per customer between Q4 2011 (when it first started collecting this data) and Q2 2012 of 3 GB to 3.7 GB. Source ComReg quarterly report questionnaire.

[69] MMDS represents only 3 % of the total number of TV households in the State.

- The number of customers receiving pay-TV services over the MMDS platform accounts for 4.3% of all pay-TV services, and has been declining for several years. Since 2011, the number of MMDS subscribers declined 17% to today.

- There is no evidence that current re-investment levels have curtailed the rate of decline of MMDS customers.

5.20 In relation to the market for potential alternative uses for the 2.6 GHz band, ComReg has regard to indicators that suggest there is growing demand for mobile internet and broadband, such as the increase in non-business user uploads/downloads (in both post and pre-paid) per month per customer.[70]

5.21 On balance of the material before it, in relation to competition impacts, ComReg finds Option 1 to be more favourable than Option 2, as the expiry of the existing licences is unlikely to have a significant negative impact on competition in the pay-TV market, and will have a positive impact on for potential alternative uses for the 2.6 GHz band.

5.3.3 Overview of consumer impacts

5.22 The detailed assessment of consumer impacts is set out at Annex 2, part of which includes an assessment of the views submitted by some MMDS consumers (which would not, in ComReg's view, be representative of all consumers, noting that MMDS subscribers makes up only 3% of total TV households in the State).

5.23 In summary ComReg considers that the vast majority of pay-TV customers (95%) are unlikely to be impacted under either Option 1 or Option 2, as MMDS subscribers make up only 4.3% of the total market. Further, with the availability of television programming content over multiple existing and new platforms (e.g existing pay-tv suppliers (BSkyB), free-to-view satellite and DTT options, IPTV) existing MMDS subscribers have several options to continue to receive TV services on the expiry of the MMDS licences.

5.24 With the trend towards the use of bundles to sell services such as television, broadband and phone services, competition in the market for pay-TV, even

[70] ComReg notes significant increases in non-business user uploads/downloads (in both post and pre-paid) in GB per month per customer between Q4 2011 (when it first started collecting this data) and Q2 2012 of 3 GB to 3.7 GB. Source ComReg quarterly report questionnaire.

absent the MMDS platform, is likely to increase in the future (see Section A 2.1.4 of the draft RIA).

5.25 On balance of the assessment of the impact on consumers, ComReg finds that Option 1 is not materially worse for consumers than Option2.

5.3.4 ComReg's preferred option: Option 1

5.26 For the summary reasons set out above, ComReg considers, on balance, Option 1 to be its preferred option.

5.3.5 Other statutory objectives assessment: Option 1

5.27 This Section considers whether, and to what extent not already dealt with as part of the draft RIA, Option 1 meets ComReg's other statutory objectives, criteria and/or relevant Policy Directions.

5.28 In particular the statutory objectives, criteria and Policy Directions now considered include:

1. Contributing to the development of the internal market (by having due regard to international developments) (see Section 12(1)(a)(ii) of the 2002 Act);

2. Promoting efficient investment and innovation in new and enhanced infrastructures (see Regulation 16(2) of the Framework Regulations);

3. Promoting regulatory predictability (by ensuring a consistent regulatory approach over appropriate review periods) (see Regulation 16(2) of the Framework Regulations); and

4. Member states shall not grant exclusive or special rights of use of radio frequencies for the provision of electronic communications services (see Article 4 of Directive 2002/77/EC on Competition Directive)[71];

5. Making regulatory decisions in relation to the electronic communications market (by taking account of the state of the industry and in particular the industry's position in the business cycle and the impact of such decisions on the sustainability of the business of undertakings affected) (See Ministerial Policy Direction No. 4 of 2003).

[71] Article 4 of Directive 2002/77/EC (Competition Directive)

1. Contributing to the development of the internal market

5.29 In the present circumstances, ComReg is of the view that the following aspects are particularly relevant to the application of this statutory objective:

i. The extent to which Option 1 would **promote the establishment and development of trans-European networks** and the interoperability of pan-European services (see Section 12(2)(b) of the 2002 Act);

ii. Taking the utmost account of the desirability that the exercise of its functions aimed at achieving its radio frequency management objectives **does not result in discrimination in favour of or against particular types of technology for the provision of ECS** (see Section 12(6) of the 2002 Act); and

iii. The extent to which ComReg has had due regard to international developments, including **consideration of activities of other Member States in relevant matters** (see Section 12(5) of the 2002 Act).

5.30 In relation to the first aspect set out at (i) above, ComReg highlights that at a European level two EC Decisions specifically identify (and designate) the 2.6 GHz radio spectrum band for European wide harmonisation for terrestrial systems capable of providing electronic communications services in the Community. These include the following European Commission Decisions:

- 2012/243/EC (the Radio Spectrum Policy Programme Decision (the "RSPP")) [72]; and

- 2008/477/EC (the harmonisation of the 2500 to 2690 MHz frequency band for terrestrial systems capable of providing electronic communications services in the Community[73].

5.31 ComReg notes that Article 6.2 of the RSPP requires Member States to carry out an authorisation process to make the band available under the terms and conditions described in 2008/477/EC by 31 December 2012, and that the

[72] European Commission Decision on *"establishing a multiannual radio spectrum policy programme".* http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2012:081:0007:0017:EN:PDF.

[73] Commission Decision 2008/477/EC of 13 June 2008 on the harmonisation of the 2 500-2 690 MHz frequency band for terrestrial systems capable of providing electronic communications services in the Community

authorisation process for it should be carried out in accordance with the Framework Directive *"…without prejudice to the existing deployment of services"*.[74]

5.32 In addition, ComReg recalls that the Radio Spectrum Committee ("RSC") considered the specific issue of the existing use of the 2.6 GHz spectrum band for MMDS services. In particular it notes that the RSC issued working document RSCOM08-39 on "Explanatory Memorandum on MMDS in the 2500 to 2690 MHz band".[75]

5.33 In brief the Explanatory Memorandum concludes that MMDS can be handled within the scope of the 2.6 GHz harmonisation Decision. The Explanatory Memorandum notes that in countries where MMDS has substantial total use of the frequency band with a long expiration deadline (as is the case in Ireland currently), that the availability of new licences in accordance with the objectives of the 2.6 GHz spectrum band harmonisation Decision is likely to be hampered. Consequently, Member States with this level of MMDS deployment are called upon to investigate the extent to which the MMDS operator is using the frequencies efficiently and whether the occupation of the entire 2.6 GHz band is justified.

5.34 ComReg considers that the availability of new licences in accordance with the objectives of the Decision 2008/477/EC happens soonest under Option 1.

5.35 In relation to the second element set out at (ii) above, ComReg notes that a service and technology neutral competitive process for the 2.6 GHz spectrum band provides an opportunity for the market rather than ComReg to determine the future use of the band. With appropriate incentives, and award design, this should lead to the most efficient use of spectrum. In ComReg's view this approach ensures that it does not discriminate in favour of or against particular types of technology for the provision of ECS.

[74] Article 6.2 of the RSPP states the following: *"In order to promote wider availability of wireless broadband services for the benefit of citizens and consumers in the Union, Member States shall make the bands covered by Decisions 2008/411/EC (3,4-3,8 GHz), 2008/477/EC (2,5- 2,69 GHz), and 2009/766/EC (900-1 800 MHz) available under terms and conditions described in those decisions. Subject to market demand, Member States shall carry out the authorisation process by 31 December 2012 without prejudice to the existing deployment of services, and under conditions that allow consumers easy access to wireless broadband services.*

[75] Radio Spectrum Committee Working Document RCSOM08-39 on "Explanatory Memorandum on MMDS in the 2500 to 2690 MHz band".

5.36 For example, if the value of the 2.6 GHz spectrum band for mobile broadband is less than the value of it for continued use to distribute television programming services, then this should be borne out in the competitive process. In this regard, ComReg notes that Option 1 provides the earlier opportunity to transition and broaden the range of uses of the 2.6 GHz spectrum in the State. This is likely to lead to knock on benefits to consumers in terms of competition in products and services.

5.37 In relation to the third and final element set out at (iii) above, ComReg refers interested parties to Chapter 4.4. ComReg notes that the position taken by other Member States can be influenced by existing licences and their remaining terms, competition in the market place, and domestic legislation and policies. ComReg has had regard to the international experience in relation to the distribution of television services using MMDS and finds that there are far fewer countries maintaining MMDS services in the 2.6 GHz band than there were in 2008 when the RSC issued its Explanatory Memorandum on MMDS in the 2500 to 2690MHz band[76].

5.38 ComReg is satisfied that Option 1 fulfils this aspect of its statutory obligations and finds no compelling reasons that contradict this view.

2. Promoting efficient investment and innovation in new enhanced infrastructures

5.39 ComReg considers that making the band available in a service and technology neutral competitive process provides more scope for new enhanced infrastructures than would a continuation of the status quo. ComReg has considered in its RIA the argument from the incumbent that if its MMDS licences are renewed it would invest in its network (infrastructure), but is not convinced by those arguments particularly in view of the continuing decline of subscribers quarter on quarter since mid 2006, such that the number of remaining subscribers stands at as little as 47,900.

5.40 On balance, ComReg believes that holding a service and technology neutral competitive process sooner promotes efficient investment and innovation in new enhanced infrastructures, as any new licensees would be able to select a range of potential services (including the continued provision of television services if it wished to do so). Prolonging the status quo unnecessarily delays the prospect of finding the most valuable use of the spectrum and implementing any appropriate incentives to promote efficient investment.

[76] RSCOM08-39

5.41 Ultimately gains in efficiency of use of spectrum will translate to gains for consumers in terms of range/quality of services and competition.

5.42 ComReg considers that after any new service and technology neutral rights of use to 2.6 GHz spectrum were made available under Option 1, with appropriate incentives in place (such incentives, might be linked to coverage and rollout conditions and ongoing spectrum usage fees reflecting the market price of spectrum), new (or existing) networks and equipment would be deployed / adapted to improve services for consumers.[77]

3. Member states shall not grant exclusive or special rights of use of radio frequencies for the provision of electronic communications services

5.43 ComReg is cognisant of its obligations to not grant exclusive or special rights of use of radio frequencies for the provision of electronic communications services.

5.44 ComReg considers that any mechanisms employed under Option 1 to make new rights of use to 2.6 GHz spectrum available need to be open, transparent and non-discriminatory. Although these mechanisms do not form part of the considerations of this paper, ComReg confirms that it will factor in this consideration when designing the authorisation process to be adopted in line with Option 1.

4. Promoting regulatory predictability

5.45 In the present context, ComReg considers that to achieve regulatory predictability it should continue to apply open, transparent and non-discriminatory approaches to facilitating the market to determine the future uses of the 2.6 GHz spectrum.

5.46 By carefully considering the practical implications associated with aiming to achieve Option 1, ComReg is satisfied that all of its statutory objectives have been met by Option 1.

[77] It should be noted, however, ComReg has not finalised its views in respect of the terms and conditions of the rights of use to 2.6 GHz spectrum. In this connection, ComReg notes that in its non-confidential submission to Document 10/38 Imagine claims that in awarding the spectrum consideration needs to be given to ensuring sufficient competition is maintained in the mobile broadband market. ComReg believes it can appropriately incentivise winners of new spectrum rights to make the most efficient use of the spectrum and deploy the most efficient technologies.

5. ***Making regulatory decisions in relation to the electronic communications market (Policy Direction No. 4 of 2003 on Industry Sustainability)***

5.47 ComReg notes that UPC considered that the review should have regard to this particular Ministerial Policy Direction. ComReg notes that this policy direction is clearly relevant and considers that the draft RIA comprehensively considers the impact to the pay-TV market (in particular). ComReg notes that this policy direction concerns the industry as a whole rather than the position of individual competitors and therefore remains of the view that Option 1 is favourable to Option 2.

5.4 Practical implications

5.48 There are a number of practical implications arising from making new rights of use to any spectrum band available.

5.49 As set out in Document 11/89 on "Strategy for Managing the Radio Spectrum: 2011 – 2013" ComReg states that:

- *"ComReg does not favour any specific approach for awarding spectrum rights, but prefers to consider each award on its merits. In all cases the selection criteria must be objective, transparent, non-discriminatory, proportionate and consistent with ComReg's statutory objectives and duties. In making such an assessment ComReg balances, amongst other things, the size and scale of the Irish market, public policy considerations, social considerations, economic and market considerations, legal factors and, where relevant expected demand and use in order to determine the most appropriate allocation method to deliver an efficient allocation outcome".*

5.50 In the present circumstances, ComReg intends to have regard to the following factors prior to issuing any consultation on the nature of such an award:

- The possibility of jointly making rights of use to spectrum in other bands available with any new rights of use to 2.6 GHz spectrum. For example, ComReg is currently looking at the potential of including rights of use to 2.3 GHz spectrum, however, there may be other appropriate spectrum bands which should be considered, and ComReg intends to seek views on same prior to finalisation;

- Potential spectrum efficiency measures including any functional/technical and economic considerations that might need to form part of a service and technology neutral competitive process for rights of use to 2.6 GHz spectrum; and

- Types of conditions attaching to the rights of use to 2.6 GHz spectrum, or on other potential spectrum rights in the future award.

5.51 In ComReg's experience, and without wishing to fetter its discretion to consult extensively and properly on all relevant matters for any potential future award of new rights of use to 2.6 GHz spectrum, and/or potential joint award including rights of use to spectrum in other bands, the most likely timeframe for new licences to commence would be in early 2016 or more specifically **April 2016**. In particular, based on ComReg's recent experience of the time spent carefully developing its Multi-Band Spectrum Auction (MBSA), where its process has been ongoing since July 2009 and has involved six main consultations and responses, including careful analysis of over 2900 pages of respondents' views and independent reports on all of its proposals, ComReg currently believes that it could only likely make new rights of use to 2.6 GHz spectrum available by April 2016 at the earliest. [78]

5.52 As a result, ComReg intends to consider ways to facilitate an ongoing efficient use of spectrum in the short period between expiry of the existing ten MMDS licences in 2014 and the commencement of any new rights of use to 2.6 GHz spectrum at 2016, and whether, and if so how, this can be achieved in a proportionate manner. This is discussed below.

5.4.1 Efficient use of 2.6 GHz spectrum up to April 2016

5.53 ComReg notes that if the ten MMDS licences expire in April 2014, and if new rights of use to 2.6 GHz spectrum cannot be made available until April 2016, the band would lie fallow for that interim period.

5.54 In the present circumstances, one approach open to ComReg would be to consider renewing the existing ten MMDS licences under Regulation 8 of the 2003 Regulations, until April 2016. Further, this course of action is provided for by Regulation 8 as follows:

[78] See also http://www.comreg.ie/radio_spectrum/consultations_and_associated_documents.713.1096.html

- *8 (1) "The Commission will, after 18 April 2010, and subject to such conditions and restrictions as are prescribed in regard thereto by these Regulations, and after such public consultation (if any) as the Commission considers appropriate, review the operation of all such licences so granted and continuing in force and may, subject to such terms and conditions as may be specified by the Commission, renew any such licences which are in force on that date for a further period of* ***up to 5 years*** *from 19 April 2014.* ***[emphasis added]***

- *(2)"Where the Commission makes a determination under paragraph (1), not to renew a licence, it may by notice in writing served on the licensee, require him or her, from the date of receipt of the notice, until the expiration of the licence term to comply with such measures relating to the upkeep of the system as may be specified in the notice"*

5.55 ComReg notes that the 2003 Regulations do not provide an automatic right of renewal.

5.56 ComReg also believes, however, that while the number of MMDS subscribers is in relative terms low (and falling), these remaining subscribers should be afforded a reasonable time to move to another platform, if as a result of the proposed competitive process that MMDS does not continue in the band. It also believes that the current service should be facilitated until the result of a competitive process was known and any potential alternative use of the band was imminent.

5.57 In the present circumstances, ComReg believes there to be an objective justification for renewing the existing MMDS licences up to April 2016

5.5 Consultation issue: MMDS licence renewal up to April 2016

5.58 Having carefully considered all of the relevant material before it, and including that ComReg considers that it is a more efficient use of spectrum to have the existing spectrum utilised in the period up to 2016 so that it can formulate and finalise the necessary procedures to conduct a service and technology neutral competitive process, ComReg sets out its draft decision to renew the exiting licences up to April 2016.

5.59 Accordingly ComReg confirms its intention for new rights of use to the 2.6 GHz spectrum band to commence at expiry of the renewed licences (being April 2016).

Q.1	Do you agree with the analysis set out in this chapter? Please provide reasons, evidence and other relevant material in support of your view.

6 Next Steps

6.1 The consultation period will run commencing 6 December 2012 and closing **Friday 31 January 2013**.

6.2 ComReg will endeavour to issue a consultation response and Draft Decision (set out at Annex 4) in advance of April 2013.

6.3 Responses must be submitted in written form to the following recipient:

Ms. Sinead Devey
Commission for Communication Regulation
Irish Life Centre
Abbey Street
Freepost
Dublin 1
Ireland
email: **marketframeworkconsult@comreg.ie**

6.4 If responses are submitted electronically, they must also be unprotected so as to facilitate online publication. In submitting any response, please also set out your reasoning and all supporting information for any views expressed.

6.5 Finally, it is sometimes necessary for respondents to provide confidential information in their submissions. Confidential information must be clearly identified as such. ComReg will publish all of the responses it receives to this consultation, subject to its guidelines on the treatment of confidential information.[79]

[79] See Document 05/24 at http://www.comreg.ie/_fileupload/publications/ComReg0524.pdf

Annexes

Annexes attaching to this Consultation and Draft Decision document (Document 12/132) are set out separately at Documents 12/132a and 12/132b.