



Commission for
Communications Regulation

Market Review: Wholesale High Quality Access at a Fixed Location

Consultation and Draft Decision

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1. Introduction

- 1.1 This consultation paper (**‘Consultation’**) presents the Commission for Communications Regulation’s (**‘ComReg’s’**) preliminary views on its analysis of the wholesale market(s) for high quality access (**‘WHQA’**) services provided at a fixed location¹. It should be read in conjunction with the Oxera Report.²
- 1.2 WHQA services, also commonly known as “wholesale leased line” services, play an important role in facilitating the provision of Information and Communications technology (**‘ICT’**) services to medium and large sized businesses, including multi-national businesses, as well as public sector institutions (e.g. hospitals, Government departments, educational facilities). In this respect, WHQA is a wholesale input into the provision of various retail data connectivity services for businesses, including for use in the provision of internet access, facilitating connectivity between a businesses’ site locations for the purpose of transferring information and/or communications, and data back-up/remote storage solutions such as cloud storage/computing (generically referred to throughout this Consultation as ‘retail business connectivity services’ or **‘RBCS’**).
- 1.3 Apart from supporting RBCS, WHQA services are also important network inputs for service providers themselves. In this respect, service providers (**‘SP(s)’**) can use WHQA services as network inputs in building out their networks, including for backhauling data and/or voice traffic. Such inputs enable them to provide a range of fixed and/or mobile communications services to consumers and business customers. SPs may also use WHQA as inputs to the provision of other wholesale services.
- 1.4 Consistent with ComReg’s statutory role to review certain electronic communications markets, the objective of this market review is to examine the extent of competition within the WHQA market(s). In circumstances where such markets are not found to be effectively competitive due to one or more SPs having Significant Market Power (**‘SMP’**), the imposition of appropriate regulatory obligations on that SP may be necessary in order to address identified competition problems that could arise in the WHQA market(s) or related markets. Similarly, if any such markets are found to be sufficiently competitive (or tending towards effective competition), then regulatory intervention may not be justified.
- 1.5 This introductory section of the Consultation describes the following:
 - (a) an overview of the WHQA market(s) (discussed in paragraphs 1.7 to 1.17 below);

¹ Corresponding to Market 4 listed in the Commission Recommendation 2014/710/EU of 09 October 2014 on relevant product and services markets within the electronic communications sector susceptible to ex ante regulation in accordance with Directive 2002/21/EC of the European Parliament and of the Council on a common regulatory framework for electronic communications networks and services (the **“2014 Recommendation”**), (OJ L 295, 11.10.2014, p. 79).

² The Oxera Report; Appendix 1.

- (b) background to the previous review of the leased line markets and why the current review is being undertaken (discussed in paragraphs 1.18 to 1.24 below)
 - (c) the legal basis and the regulatory framework under which this Consultation is being undertaken (discussed in paragraphs 1.25 to 1.39 below);
 - (d) reasons for undertaking the current market review and an outline of the information sources relied upon for the analysis set out in the Consultation (discussed in paragraphs 1.40 to 1.50 below);
 - (e) the procedure for the Consultation process including timeframes within which respondents should submit their views, and ComReg's liaison with the Competition and Consumer Protection Commission ('CCPC') (discussed in paragraphs 1.51 to 1.57 below); and
 - (f) an overview of the structure of the Consultation document (discussed in paragraph 1.58 below).
- 1.6 Section 2 of the Consultation contains an executive summary of the overall preliminary conclusions in this Consultation. A glossary of terms used frequently throughout this Consultation is also set out in Appendix: 10 of this Consultation.

What is WHQA?

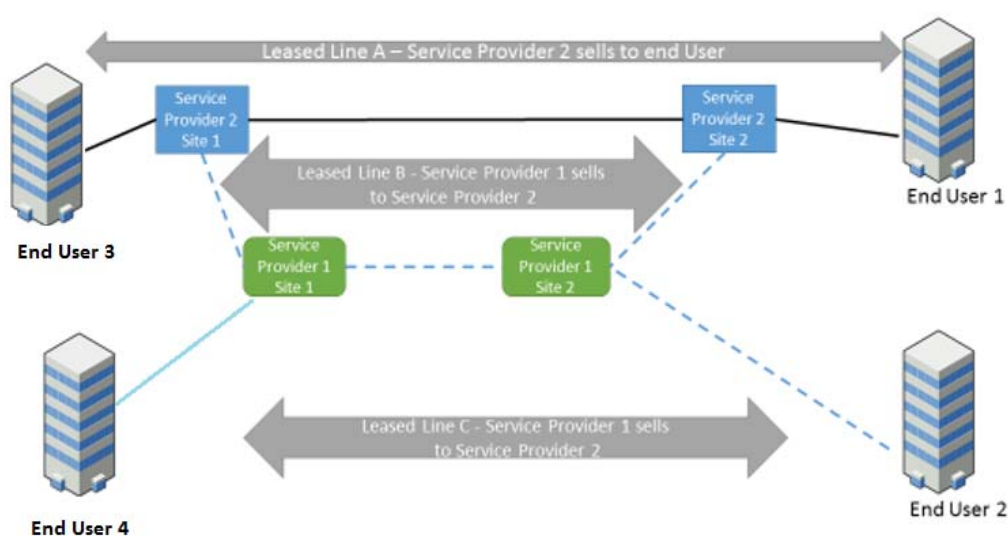
- 1.7 WHQA is a wholesale service that involves the supply of dedicated transmission capacity between fixed locations via fixed or wireless connections and is commonly referred to as leased line ('LL(s)') services.³ WHQA services typically include guaranteed high quality service levels, symmetric upload and download speeds, and guaranteed availability.⁴ Currently there are many SPs supplying wholesale leased line services in Ireland, including Eircom.
- 1.8 The purchase of wholesale LL services enables SPs to offer retail LL services that can be used for a variety of applications such as voice (fixed and/or mobile), video and data communications. Typically, retail LL services are demanded by organisations in both private and public sectors, in order to support a wide variety of ICT applications, such as (but not limited to) access to the internet, private voice and data networks, cloud based services, backup and disaster recovery, remote monitoring and telemetry applications. Retail LL services are also used to build Virtual Private Networks ('VPNs') that allow organisations to link business sites together, including data centres, so that offices can exchange data and access corporate applications. This also allows retail organisations to offer a multiplicity of services to business and retail consumers via the internet or data networks.

³ The Consultation refers to either Wholesale High Quality Access or Leased Lines interchangeably throughout this document.

⁴ Section 4.2.1; EU Explanatory Note accompanying the Commission Recommendation on relevant product and service markets within the electronic communications sector susceptible to ex ante regulation, dated 9.10.2014 (the '[Explanatory Note to the 2014 Recommendation](#)').

- 1.9 Wholesale LL services allow SPs to provide retail LL (and associated) services to customers that could not otherwise be capable of being served through the use of their own network. For example, a SP may wish to provide retail LL services to a customer's premises, but may not have a direct access connection to that customer's premises over which LL services can be provided. Such a SP can then, at the wholesale level, purchase wholesale LL services from another SP which it, in turn, uses in providing its downstream retail LL services.
- 1.10 These services also allows a SP to establish a new point of presence ('POP') in an area using 3rd party LLs to connect this POP to its closest pre-existing nodes or network. It may subsequently build out its own network to directly connect this POP when it has established sufficient concentrations of customers in this area to commercially justify this network expansion.
- 1.11 SPs are also purchasing wholesale LL services in order to build their own networks as well as to supply fixed or mobile backhaul services. For example, wholesale LL connections are used by Mobile Network Operators ('MNO') to convey traffic from a dispersed set of radio access nodes/base stations to a centralised location where calls and data can be routed over core networks to their eventual destination.
- 1.12 The relationship between wholesale LL services (and regulation) and the manner in which they are used in supplying retail LL services is illustrated in the stylised examples set out in Figure 1 to Figure 3 below.⁵

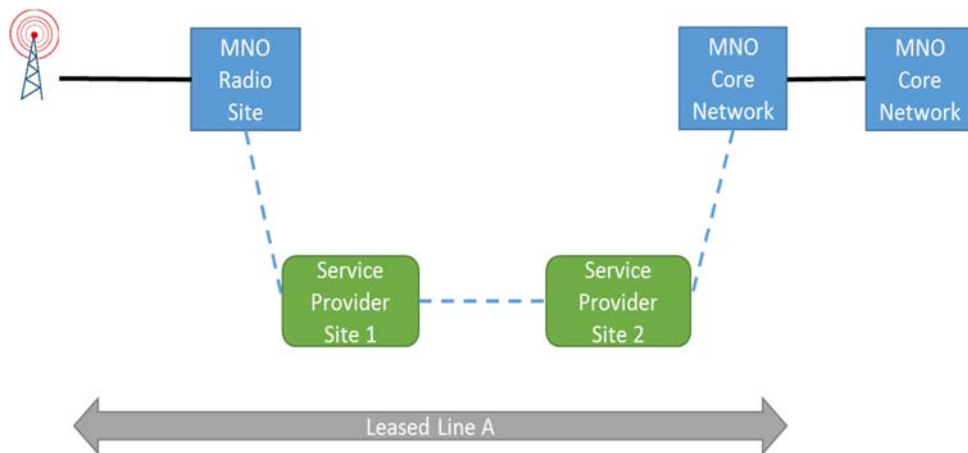
Figure 1: Typical use of WHQA Services when Supplying Retail Leased Lines



⁵ These examples are for illustration purposes only and do not detail all Leased Line configurations

1.13 In Figure 1 LL A illustrates various (but not exhaustive) uses of upstream WHQA inputs to provide a retail LL services. For Leased Line A, SP 2 provides a retail LL connecting End Users 1 and 3. It achieves this using its own local access from each of its nodes at either end. Crucially, it uses a wholesale LL (Leased Line B) purchased from SP1 to connect between both of its nodes. Another scenario is that of pure resale, Leased Line C. This is where SP 2 installs a line entirely on its own network connecting End Users 2 and 4, on behalf of SP1. SP2 purchases this LL in its entirety from SP 1 i.e. it does not connect to the network of the retail SP.

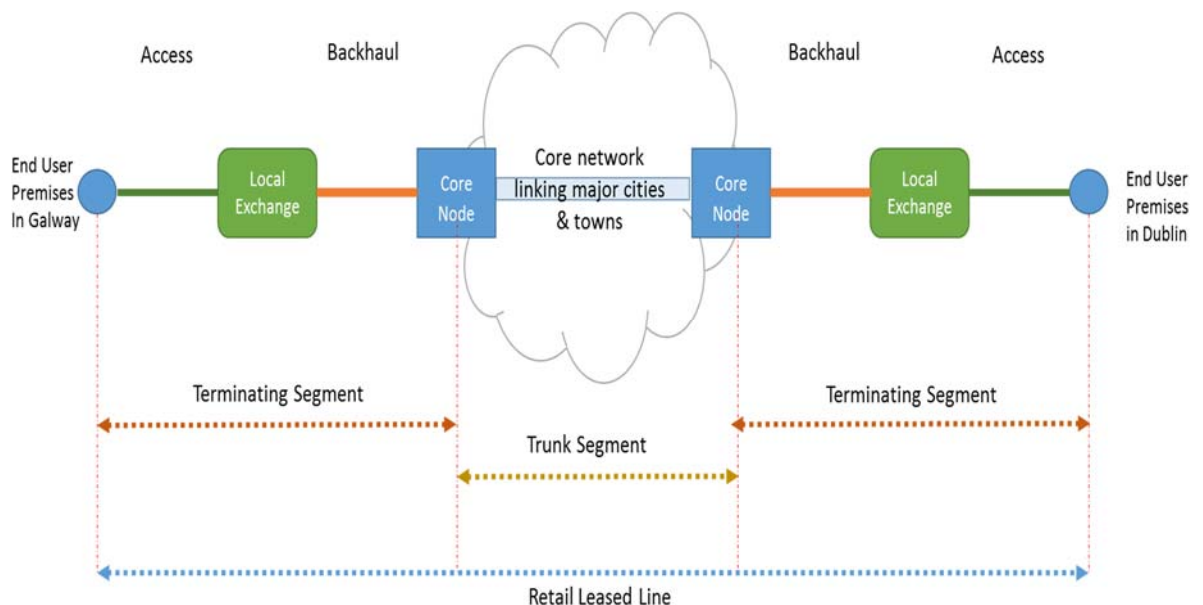
Figure 2: Typical use of WHQA services by MSPs



1.14 In Figure 2 the MNO purchases wholesale LLs from Service Provider 1 in order to convey traffic from its radio site to its core network.

1.15 In this Consultation, ComReg makes a distinction between different components of the LL connections. The distinction is between the trunk and terminating segments of LL as shown in Figure 3 below:

Figure 3: Wholesale LL by network segments



1.16 There are two broad types of wholesale LL services:

- (a) **End-to-end services:** these link two end-user sites, where either end could be a business consumer end-user or SP network site. These are comprised of local access connections either directly connected at the same local serving node or exchanges or two geographically separated local ends connected across the core network of a SP. These can also consist solely of core capacity in the instance where both ends are network nodes connected with high bandwidth services. Thus an end-to-end leased line can range in scale from an analogue line connecting two business premises to a multiple 100 Gb/s service connecting data centres or network nodes.
- (b) **Interconnection based or Partial Private Circuit⁶ ('PPC') type Terminating segments of Wholesale LL:** A detailed explanation of PPCs is set out in Section 5⁷. These segments most commonly link an end-user's premises to the network node of the SP purchasing the terminating segment, enabling the purchasing SP to assemble an end-to-end LL service using a combination of wholesale LL inputs and its own network. Terminating segments can also be used to link together network nodes in the purchasing SP's network. Terminating segments consist of access and any (necessary) backhaul segments (and associated facilities) as discussed below:
- (i) *Access segments:* these are typically the final network circuit connecting an end-user's premises to a local access node - for example - on Eircom's network this might be in a local exchange ('LE') or an equivalent point on another authorised operator's ('OAO') network.
 - (ii) *Backhaul segments:* these are connections running from a local access node back to the purchasing SP's own core network (or between exchanges). Backhaul segments often make greater use of shared infrastructure, including physical sharing.

1.17 SPs purchasing wholesale LL services typically pay a once-off connection/installation fee which typically depends on the location and length of the connection from the end-user location to serving network node of the purchasing SP. It may also depend on the amount of any civil engineering work required to achieve connectivity. Furthermore, SPs pay recurring wholesale charges which depend on a number of factors including the connection bandwidth, the class of service or priority queuing of the data carried on the LL and, in some instances, the location of the purchased connection.

⁶ PPC Partial Private Circuit is an interconnection based service where the Access Seeker provides a portion of the LL infrastructure. Typically, the incumbent operator provides a connection to a single customer premises (commonly referred to as a "half-circuit") while the other "end" of the circuit for connecting to the customer's other premises or service, will be provided on the Access Seekers network or achieved through some other means.

⁷ See paragraphs 5.27 to 5.28 below.

Previous Market Review and Subsequent Developments

Previous Market Review

- 1.18 The previous review of the WHQA market (then known as market for wholesale terminating segments of leased lines) was completed in 2008⁸ (the '**2008 Decision**'). The 2008 Decision defined the market for wholesale terminating segments of leased lines ('**2008 Leased Lines Wholesale Market**') as follows:
- (a) All products offering fixed permanent point-to-point symmetric termination belong in the same market irrespective of the technology used to deliver the product and/or product bandwidth.
 - (b) The geographic scope of the market for wholesale terminating segments of leased lines was considered to be national.
- 1.19 Having assessed competition in the 2008 Leased Lines Wholesale Market, ComReg designated Eircom as having SMP and imposed a range of remedies/obligations upon Eircom which, amongst other things, required it to offer Wholesale Leased Lines ('**WLLs**')⁹ and Partial Private Circuits ('**PPCs**')¹⁰, including handover¹¹ to **Access Seekers**¹² at regulated prices, in order to address the identified competition problems.
- 1.20 The 2008 Decision also examined the retail market for leased lines (in particular the minimum set of retail leased lines),¹³ as well as the market for trunk segments of wholesale leased lines. It found both of these markets to be effectively competitive (in the presence of regulation of wholesale terminating segments of LLs).

⁸ See "Market Analysis – Leased Lines Market Review, ComReg Document 08/103, Decision D06/08", dated 22 December 2008 ('**2008 Decision**').

⁹ Eircom's WLLs connect directly to the end-user A-end and B-end locations and does not require any OAO infrastructure.

¹⁰ A Partial private circuit is an Eircom wholesale product that connects only one end-user local end and thus, requires the OAO to interconnect with Eircom at PPC interconnect sites. See Section 5 for further description of PPCs.

¹¹ Handover refers to the point of interconnection between the two networks, simply the point at which the circuits are "handed over" from one SP to another.

¹² Access Seekers as referred to throughout this Consultation as those undertakings (or OAOs) that purchase, or could potentially purchase, WHQA LL services.

¹³ Analogue lines and leased lines up to a bandwidth of 2Mb/s.

- 1.21 The 2008 Decision specified that the competitive wholesale trunk segment¹⁴ of wholesale leased lines consisted of circuits between certain urban centres¹⁵ of capacity equal to or greater than STM-1 (155Mb/s). It also defined the regulated (uncompetitive) wholesale terminating segment of leased lines to be all of the remaining wholesale market i.e. that which was not specifically described as being part of the trunk segment was deemed to be part of the terminating segment market.

Subsequent Developments

- 1.22 In 2010, following a public consultation, ComReg decided¹⁶ to add an additional urban centre (Portlaoise) to the list of urban centres constituting the boundary of the wholesale trunk market as set out in the 2008 Decision. This followed a request from Eircom to expand the list to include seven additional centres¹⁷. Thus, in 2010 regulation was withdrawn from Eircom with respect to wholesale leased lines of STM-1 and greater capacity that connect Portlaoise to any of the other urban centres identified in the 2008 Decision.
- 1.23 In 2013, following a public consultation, ComReg¹⁸ further expanded the list of urban centres and included Athlone, Charleville, Mallow and Roscommon (following Eircom's request to expand the trunk segment of the 2008 Leased Lines Wholesale Market and include an additional six urban centres)¹⁹. Thus, in 2013 the scope of 2008 Leased Lines Wholesale Market was further extended (with these additional urban centres not being subject to *ex ante* regulation).
- 1.24 Subsequent to the 2008 Decision, ComReg has also made a number of other decisions related to the remedies/obligations imposed in the 2008 Leased Lines Wholesale Market including:

¹⁴ See Figure 3 above for the description of trunk and terminating segments of WHQA connections.

¹⁵ See Annex A of the 2008 Decision.

¹⁶ See "[Leased Line Markets: Review of Urban Centres, ComReg Document 10/12, Decision D02/10](#)", dated 15 February 2010; (**'The 2010 Urban Centres Decision'**)

¹⁷ Athlone, Bray, Carlow, Clonmel, Naas, Portlaoise and Swords.

¹⁸ See "[Leased Line Markets: Further review of Urban Centres, ComReg Document 13/75, Decision D12/13](#)", dated 29 July 2013. (**'The 2013 Urban Centres Decision'**).

¹⁹ Athlone, Charleville, Mallow, Roscommon and Tullamore.

- (a) 2009 Ethernet Determination²⁰ which explicitly noted that a request for uncontended wholesale Ethernet access falls within the market for wholesale terminating segments of leased lines and is subject to the obligations imposed on Eircom by ComReg Decision Notice D07/05²¹. These obligations include but are not limited to obligations of access and non-discrimination.
- (b) 2011 Access and Transparency Decision²² which amended transparency and access obligations²³; and
- (c) 2012 Price Control Decision²⁴ which further specified the price control obligations and in particular, methodologies used to derive regulated prices for Eircom's WLL, PPC and wholesale Ethernet services²⁵.

²⁰ See "[Determination in the dispute between BT Ireland and Eircom Limited in relation to alleged failure by Eircom to provide Leased Line termination segments based on uncontended Ethernet access, ComReg Document 09/58](#)", dated 14 July 2009.

²¹ See "[Market Analysis: Retail Leased Lines and Wholesale Terminating and Trunk Segments of Leased Lines \(National\), ComReg Document 05/29, Decision D7/05](#)", dated 30 March 2005 ('**2005 Decision**').

²² See "[Amendments to the transparency obligation and the access obligation in the market for wholesale terminating segments of leased lines, ComReg Document 11/22, Decision D02/11](#)", dated 22 March 2011. (**2011 Access and Transparency Decision**)

²³ The 2011 Transparency and Access obligations Decision set out that Eircom is no longer required to publish pricing information for WLL circuits of greater than 10Mb/s as it was accepted that the existing custom and practise of providing such pricing on application was sufficient for efficient operation of the market. The decision also obliged Eircom to amend frequency of billing offered by it to Access Seekers from a quarterly to a monthly basis, one month in advance of the provision of services in the 2008 Leased Lines Wholesale Market.

²⁴ See "[A final decision further specifying the price control obligation in the market for wholesale terminating segments of leased lines, ComReg Document 12/03, Decision D02/12](#)", dated 2 February 2012. (**2012 Price Control Decision**)

²⁵ Amongst other things ComReg specified that it will apply cost orientation to determine maximum PPC charges using bottom-up long-run average incremental costs plus ('**BU-LRAIC plus**') model while for WLLs the maximum charges will be based on the published prices (at the time) as well as a minimum price floor which is set on the basis of the appropriate margins squeeze test ('**MST**') between WLLs and PPCs on a similarly efficient operator ('**SEO**') basis.

Legal Basis and Regulatory Framework

- 1.25 This market review is being undertaken by ComReg in accordance with the obligation under the **Framework Directive**²⁶ (transposed into Irish law as the **Framework Regulations**²⁷) that National Regulatory Authorities ('NRAs') should analyse and define relevant market(s) taking the utmost account of the 2014 Recommendation²⁸ (including the Explanatory Note to the 2014 Recommendation)²⁹ and the SMP Guidelines³⁰.
- 1.26 Regulation 26 of the Framework Regulations requires that ComReg, taking the utmost account of the 2014 Recommendation and of the SMP Guidelines, defines relevant markets appropriate to national circumstances, in accordance with the principles of competition law.
- 1.27 The European Commission ('EC') refers in the 2014 Recommendation to the WHQA market as follows:
- "Wholesale high-quality access provided at a fixed location"*³¹
- 1.28 The Explanatory Note to the 2014 Recommendation provides further information about the nature of WHQA market and in this respect notes that:

²⁶ Articles 15 and 16 of Directive 2002/21/EC of the European Parliament and of the Council on a common regulatory framework for electronic communications networks and services, as amended by Directive 2009/140/EC (the '**Framework Directive**').

²⁷ European Communities (Electronic Communications Networks and Services) (Framework) Regulations 2011 (S.I. No. 333 of 2011) (the '**Framework Regulations**'). The Framework Regulations transpose the Framework Directive.

²⁸ European Commission Recommendation 2014/710/EU of 09 October 2014 on relevant product and services markets within the electronic communications sector susceptible to ex ante regulation in accordance with Directive 2002/21/EC of the European Parliament and of the Council on a common regulatory framework for electronic communications networks and services (the '[2014 Recommendation](#)'), (OJ L 295, 11.10.2014, p. 79).

²⁹ Explanatory Note accompanying the Commission Recommendation on relevant product and service markets within the electronic communications sector susceptible to ex ante regulation, dated 9.10.2014 (the '[Explanatory Note to the 2014 Recommendation](#)').

³⁰ European Commission guidelines on market analysis and the assessment of significant market power under the Community regulatory framework for electronic networks and services, OJ 2002 C 165/3 (the '[SMP Guidelines](#)').

³¹ Market 4 in the annex to the 2014 Recommendation.

“... a wholesale market for high-quality access includes a wider range of access products necessary to fulfil the needs of business services providers (and ultimately large retail business customers) and which displays the service characteristics..... such as: (i) guaranteed availability and high quality of service in all circumstances including SLAs, 24/7 customer support, short repair times and redundancy, typically found in a services environment geared to the needs of business customers; (ii) high-quality network management, including of backhaul, resulting in upload speeds appropriate for business use and very low contention; (iii) the possibility to access the network at points which have been defined according to the geographic density and distribution of business rather than mass-market users; (iv) the possibility to offer separate Ethernet continuity (e.g. through an additional header allowing for several layers of virtual LANs).”³².

- 1.29 It should also be noted that prior to the adoption of the 2014 Recommendation WHQA market was broadly identified in the 2007 Recommendation³³ as the market for wholesale terminating segments of leased lines (**‘2007 Wholesale Leased Lines Recommended Market’**)³⁴. As noted in paragraph 1.18, the 2007 Wholesale Leased Lines Recommended Market has been identified by ComReg as being susceptible to *ex ante* regulation and was thus regulated by ComReg pursuant to the 2008 Decision. Given the 2007 Recommendation has been replaced by the 2014 Recommendation, it is the latter which is now applicable for this current market review.
- 1.30 Having regard to Regulation 25 of the Framework Regulations, where ComReg determines, as a result of a market analysis carried out by it in accordance with Regulation 27 of the Framework Regulations, that a given market identified in accordance with Regulation 26 of the Framework Regulations is not effectively competitive, ComReg is obliged under Regulation 27(4) of the Framework Regulations to designate an undertaking(s) with SMP in that market and impose on such undertaking(s) such specific obligations as it considers appropriate, or maintain or amend such obligations where they already exist.

³² See page 50 of Explanatory Note to the 2014 Recommendation.

³³ European Commission Recommendation of 17 December 2007 on relevant product and service markets within the electronic communications sector susceptible to *ex ante* regulation in accordance with Directive 2002/21/EC of the European Parliament and of the Council on a common regulatory framework for electronic communications networks and services OJ L 344 (the [‘2007 Recommendation’](#))

³⁴ The WHQA market broadly corresponds to the 2007 Wholesale Leased Lines Recommended Market. However, the scope of WHQA market was broadened to include contended and asymmetric wholesale access products offered by a network owner to a wholesale access seeker over copper or hybrid infrastructures if these products display certain advanced quality characteristics at the wholesale level as described in paragraph 1.28 above.

- 1.31 In line with the with the “Modified Greenfield Approach” (**MGF**) set out in the Explanatory Note to the 2014 Recommendation³⁵, ComReg’s assessment starts from the assumption that SMP regulation is not present in the market(s) under consideration, i.e. no *ex ante* regulation in the specific WHQA market under consideration. However, regulation present in other related markets³⁶ or through the general regulatory framework is considered. This approach is used in order to avoid drawing conclusions regarding the competitive structure of a particular market which may be influenced by, or indeed premised on, existing regulation on that market. Considering how a market may function absent regulation, helps to ensure that SMP based regulation is only applied (or withdrawn) in those circumstances where it is truly justified and proportionate.
- 1.32 Where an operator is ultimately designated as having SMP in a market, ComReg is obliged, under Regulation 8(1) of the **Access Regulations**³⁷, to impose on such an operator (or maintain where they already exist) such of the obligations set out in Regulations 9 to 13 of the Access Regulations as it considers appropriate. Obligations imposed must:
- (a) be based on the nature of the problem identified;
 - (b) be proportionate and justified in the light of the objectives laid down in section 12 of the **Communications Regulation Act 2002** (as amended)³⁸, and Regulation 16 of the Framework Regulations; and
 - (c) only be imposed following consultation in accordance with Regulations 12 and 13 of the Framework Regulations.
- 1.33 Section 12(1)(a) of the Act sets out ComReg’s objectives³⁹ in exercising its functions in relation to the provision of electronic communications networks, electronic communications services and associated facilities, namely:
- (a) to promote competition;
 - (b) to contribute to the development of the internal market; and
 - (c) to promote the interests of users within the European Union.

³⁵ See page 8 of Explanatory Note to the 2014 Recommendation

³⁶ For example, regulation for the market Wholesale central access for mass-market products provided at a fixed location (**WLA**).

³⁷ European Communities (Electronic Communications Networks and Services) (Access) Regulations 2011 (S.I. No. 334 of 2011) (the **Access Regulations**). The SMP Guidelines also state at paragraph 17 that “NRAs must impose at least one regulatory obligation on an undertaking that has been designated as having SMP”.

³⁸ Communications Regulation Act 2002 (No. 20 of 2002), as amended.

³⁹ Article 8 of the Framework Directive sets out similar objectives for NRAs and notes that in pursuing these policy objectives NRAs shall apply objective, transparent, non-discriminatory and proportionate regulatory principles.

- 1.34 Apart from conducting a public consultation in accordance with Regulation 12 of the Framework Regulations, ComReg is also obliged to make its draft measures accessible to the EC, **BEREC**⁴⁰ and the NRAs in other Member States pursuant to Regulation 13(3) of the Framework Regulations.
- 1.35 Pursuant to Regulation 27(1) of the Framework Regulations, ComReg is required to carry out an analysis of the Relevant Markets in accordance, where appropriate, with an agreement with the CCPC under section 34 or 47G of the Competition Act 2002 (as amended).
- 1.36 Overall, in preparing this Consultation, ComReg has taken account of its functions and objectives under the Communications Regulation Acts 2002 (as amended), in addition to requirements under the Framework Regulations and the Access Regulations.
- 1.37 The analysis undertaken in this Consultation also takes the utmost account of the following documents (along with other documents as noted elsewhere throughout this Consultation):
- (a) the 2014 Recommendation and the Explanatory Note to the 2014 Recommendation on relevant product and service markets susceptible to *ex ante* regulation within the electronic communications sector;
 - (b) the SMP Guidelines on market analysis and the assessment of significant market power; and
 - (c) the 2005 Accounting Separation and Cost Accounting Recommendation⁴¹.
- 1.38 ComReg also takes account of:
- (a) the **Notice on Market Definition**⁴² for the purposes of community competition law
 - (b) any relevant common positions adopted by BEREC⁴³; and
 - (c) any relevant EC comments made, pursuant to Article 7 and 7a of the Framework Directive, with respect to NRAs' market analyses.

⁴⁰ Body of European Regulators for Electronic Communications ('**BEREC**') as established by Regulation (EC) No 1211/2009 of the European Parliament and of the Council of 25 November 2009 the Body of European Regulators for Electronic Communications (BEREC) and the Office.

⁴¹ European Commission Recommendation of 19 September 2005 on accounting separation and cost accounting systems under the regulatory framework for electronic communications (2005/698/EC) (the '[2005 Accounting Separation and Cost Accounting Recommendation](#)').

⁴² Commission notice on the definition of relevant market for the purposes of Community competition law, (the '[Notice on Market Definition](#)'), Official Journal C 372, 09/12/1997 P. 0005 – 0013.

⁴³ See BEREC Common Position on geographic aspects of market analysis (definition and remedies) of 5 June 2014, BEREC Document number BoR (14)73, (the '[2014 BEREC Common Position on geographic aspects of market analysis](#)') and Revised BEREC Common Position on best practices in remedies as a consequence of a SMP position in the relevant markets for wholesale leased lines of 26 November 2012, BEREC Document number BoR (12) 126, (the '[2012 BEREC Common position on remedies in wholesale leased lines markets](#)').

- 1.39 ComReg is assessing the WHQA market(s) in the context of the market analysis framework and documents explained above.

Current Review

- 1.40 Given the time that has elapsed since ComReg's previous analysis of the 2008 Leased Line Wholesale Market and, having regard to market developments, including the publication of the 2014 Recommendation, it is now considered appropriate to carry out a further market review.
- 1.41 As part of this market review, ComReg has obtained qualitative and quantitative information from providers of retail and wholesale LL services through a series of formal⁴⁴ and informal information requests in relation to the retail LL and wholesale LL markets. This information is also supplemented with information which is provided to ComReg in the performance of its regular operations (e.g. for the Irish Communications Market Quarterly Key Data Report ('**QKDR**'). ComReg has also reviewed, in detail, the experience of regulating relevant wholesale LL markets in other European jurisdictions and has carefully analysed guidance available from the EC, BEREC and other relevant commentators before arriving at its preliminary views in this Consultation.
- 1.42 ComReg has also carried out market research to inform its understanding of business attitudes/behaviours in the retail broadband market and the retail LL market. Two separate business surveys were undertaken, a survey of small and medium enterprises along with corporate businesses. This survey is published by ComReg alongside this Consultation (referred to as the '**2014 Market Research**') and is set out in Appendix: 2⁴⁵.
- 1.43 ComReg is mindful that surveys, while a useful practical means of gathering information on consumer and business preferences/behaviours, need to be interpreted with care and that stated preferences of survey respondents can differ from what how they behave in practice. Therefore, ComReg does not solely or overly rely on the 2014 Market Research in forming its preliminary conclusions as set out in this Consultation. ComReg considers all the information available to it at the time of publishing this Consultation.

Information Sources Relied Upon

- 1.44 In conducting its analysis, as noted in paragraphs 1.41 and 1.42 above, ComReg has drawn on data from a number of sources, including:
- (a) The 2014 Market Research. This included attitudinal surveys of business users of retail broadband, retail HQA and other services. This research is being published alongside this Consultation.

⁴⁴ Information provided by operators in response to detailed statutory information requests ('**Statutory Information Requests**') issued by ComReg.

⁴⁵ See 'SME and Corporates Surveys' (the '**2014 Market Research**'),

- (b) Information provided by Service Providers in response to detailed statutory information requests issued by ComReg in which both quantitative and factual information on the retail leased lines market and the WHQA market was sought. This included statutory information requests issued in 11 February 2014⁴⁶, 05 December 2014⁴⁷ and in 15 January 2016⁴⁸, (together referred to as the '**Statutory Information Requests**' or '**SIRs**');
 - (c) Information provided to ComReg in subsequent follow-up correspondence and discussions in relation to (b) above;
 - (d) Information provided to ComReg by SPs for the purpose of the QKDR;
 - (e) Information provided by SPs to ComReg through a non-statutory based qualitative questionnaire ('**Qualitative Questionnaire**');
 - (f) Meetings with major consumers of retail leased line services⁴⁹; and
 - (g) Other information in the public domain.
- 1.45 ComReg notes that it has encountered substantial difficulties in gathering complete and accurate information from SPs via Statutory Information Requests which impeded ComReg's ability to assess in a timely manner whether *ex ante* regulation is required in the WHQA market and delayed the publication of this Consultation. The examples of such difficulties include non-provision of requested information⁵⁰ or provision of incomplete information, provision of information in format different from that requested by ComReg as well as substantial inaccuracies in the information provided. The detailed list of issues encountered by ComReg, along with our process to mitigate and ameliorate these issues is outlined in Appendix: 3 of this Consultation. ComReg believes that the remedial actions it has taken has rendered the data sets used to calculate market shares (amongst other purposes) for the years 2013, 2014 and 2015 fit for purpose. It specifically engaged consultants Tera to review its data collection and treatment processes and its report is published in Appendix: 6 of this Consultation ('**Tera Report**') and ComReg's response to this report is contained in Appendix: 7.
- 1.46 Consultants Oxera were also engaged to assist ComReg with *inter alia* market definition and it inspected data as part of this remit required it to calculate markets shares (national and geographic) using an alternate method to that used by ComReg from operator data and ComReg aggregate data and its results are published within it the Oxera Report in Appendix: 1.

⁴⁶ The 'February 2014 Statutory Information Requests'.

⁴⁷ The 'December 2014 Statutory Information Requests'.

⁴⁸ The '2015 Statutory Information Requests'.

⁴⁹ Such as [HEA net](#), [Government Services](#) and [Dublin City Council](#).

⁵⁰ See "[ComReg v Vodafone: District Court Hearing on Failure to Provide Information to ComReg, ComReg Document 15/101](#)", dated 08 September 2015.

- 1.47 The 2014 Market Research referred to in paragraph 1.42 above was undertaken by ComReg to inform its WHQA market review and examined business attitudes to various issues related to the provision of retail LL, broadband and other services. The field work supporting the 2014 Market Research took place in the period 10 November 2014 to 5 December 2014 with the results finalised and provided to ComReg in February 2015. As part of the 2014 Market Research, 1,000 SME's and 100 Corporates among a nationally representative sample of businesses operating in Ireland were surveyed via a computer aided telephone interview ('CATI'), with the person interviewed being the individual responsible for selecting the relevant business's telecommunications providers. The survey examined, amongst other things:
- importance placed by businesses on ownership and usage of particular technologies used to provide retail LL and broadband services including importance of various LL characteristics such as speed and service quality;
 - willingness of businesses to switch between SPs of retail LL services and technologies used to provide these services and the main factors that are driving switching behaviour;
 - businesses' views on substitutability between retail LL and broadband services;
 - attitudes and reactions to notional changes in the price of telecommunications services; and
 - the importance of bundled services offers for business customers and the value that different services may hold within a bundle and in the purchasing decision of business customers (e.g. IT or cloud services).
- 1.48 ComReg refers to the findings from the 2014 Market Research, along with the other data sources referred to above, throughout the remainder of the analysis in this Consultation.
- 1.49 It should be noted that, rather than being definitive, the 2014 Market Research informs the analysis throughout this Consultation, and its outputs are considered alongside empirical data/evidence, where available, in particular, alongside information gathered in response to Statutory Information Requests and data presented in the QKDRs.
- 1.50 However, it should also be noted that ComReg intends to re-fresh some of the data sources identified above in parallel with this Consultation process, and will take such updated data, including respondents' views, into account when issuing its final decision.

Liaison with the Competition and Consumer Protection Commission

- 1.51 In accordance with Regulation 27(1) of the Framework Regulations, ComReg will consult with the CCPC on its preliminary views on the relevant WHQA market(s). ComReg will continue to keep the CCPC informed throughout the conduct of this market analysis process.

Consultation Process

- 1.52 As noted above, the purpose of this Consultation is to set out ComReg's preliminary views on its analysis of the relevant WHQA market(s) (i.e. product and geographic definition, competition analysis and assessment of SMP and any proposed remedies where they are considered appropriate).
- 1.53 ComReg invites all interested parties to respond to the questions set out in this Consultation, and/or to comment on any other aspect of the Consultation. In so doing, respondents are requested to clearly explain the reasoning for their response, indicating the relevant paragraph numbers within the Consultation to which their response refers, along with all relevant factual evidence supporting views presented.
- 1.54 Respondents should submit views in accordance with the instructions set out below. Respondents should also be aware that all non-confidential responses to this Consultation will be published, subject to the provisions of ComReg's guidelines on the treatment of confidential information.⁵¹ **Respondents should ensure that a non-confidential version of their response is provided by the closing date set out below. Confidential elements of responses must be clearly marked as such and be set out in a separate document which must also be provided to ComReg by the closing date set out below.**
- 1.55 All responses should be clearly marked with "**Response to ComReg Document 16/69**" and sent by post, facsimile or email to the address below to arrive on or before **17:00 on 14 October 2016**.

Mr. Arvydas Vidziunas
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- 1.56 In submitting comments, Respondents are requested to provide a copy of their submissions in an unprotected electronic format in order to facilitate their subsequent publication by ComReg.

⁵¹ See "[Guidelines on the treatment of confidential information, ComReg document 05/24](#)" ComReg Document 05/24, "Guidelines on the treatment of confidential information", dated 22 March 2005.

1.57 This is a non-confidential version of the Consultation. Certain information within the Consultation has been redacted for reasons of confidentiality, with such redactions indicated by the symbol X . Should an individual SP wish to review its own redacted information⁵², it should make a request for such in writing to ComReg (to the person identified in paragraph 1.55 above) and indicate the specific paragraph numbers within which the redacted information being requested is contained. ComReg will consider requests for redacted information and would, subject to the protection of confidential information, respond accordingly.

Structure of this Consultation

1.58 The remainder of this Consultation is structured as follows:

- Section 2 contains the executive summary of the issues and proposals for regulation/de-regulation of the relevant WHQA market(s);
- Section 3 provides an overview of key retail trends that have occurred in the retail LL market(s) since the 2008 Decision;
- Section 4 sets out ComReg's assessment of the retail leased line market(s) in terms of both their product and geographic scope;
- Section 5 defines the proposed scope of the WHQA LL markets;
- Section 6 assesses competition within each of the defined WHQA LL market(s) alongside the assessment as to whether any undertaking operating within such markets holds a position of SMP;
- Section 7 sets out the main competition problems that could, absent regulation, occur within WHQA market(s) where ComReg has identified SMP;
- Section 8 proposed regulatory remedies to address competition problems in markets where ComReg has identified SMP, namely, in the form of obligations that would be imposed on an undertaking having SMP;
- Section 9 sets out ComReg's proposed approach to the withdrawal of obligations in markets where ComReg has identified that no SP has SMP;
- Section 10 sets out ComReg's Regulatory Impact Assessment ('**RIA**') of the proposed approaches to regulation and de-regulation in the WHQA LL market(s);
- Section 11 sets out the next steps that will follow the publication of this Consultation;
- Appendix: 1 sets out the Oxera Report;
- Appendix: 2 sets out the 2014 Market Research;

⁵² Information may not be made available where its provision would lead to a reasonable expectation that it could undermine the confidentiality of another SP's information.

- Appendix: 3 sets out issues experienced in the collection of data from SPs and how ComReg dealt with such issues;
- Appendix: 4 sets out various graphical representations of market share calculations.
- Appendix: 5 sets out a list of business parks identified by ComReg as being served by multiple LL SPs;
- Appendix: 6 sets out the Tera Report;
- Appendix: 7 sets out ComReg's response to the Tera Report;
- Appendix: 8 sets out the Draft Decision Instrument giving effect to the preliminary positions set out in this Consultation;
- Appendix: 9 sets out the various questions set out throughout this Consultation;
- Appendix: 10 sets out a glossary of frequently used terms within this Consultation;
- Appendix: 11 sets out maps used by ComReg in its WHQA analysis; and
- Appendix: 12 sets out information on broadband services used by ComReg in the analysis.

2. Executive Summary

- 2.1 In this Consultation ComReg presents its preliminary views on its analysis of the market for wholesale high quality access ('**WHQA**') services provided at a fixed location.
- 2.2 WHQA services, also commonly known as "wholesale leased line" services, play an important role in facilitating the provision of downstream retail leased lines services, as well as being used by Service Providers ('**SP(s)**') as network inputs to extend the coverage of their networks.
- 2.3 Leased line ('**LL**') services provide dedicated high quality and reliable data connectivity between physical locations and support the provision of retail Information and Communications technology ('**ICT**'). LL services, whether retail or wholesale, and typically include guaranteed high quality service levels, symmetric upload and download speeds, and guaranteed service availability.
- 2.4 Typically, retail LL services are demanded by organisations in both the private and public sectors, to support a wide variety of ICT applications, such as (but not limited to) access to the internet, private voice and data networks, cloud based services, backup and disaster recovery, remote monitoring and telemetry applications. Retail LL services are also used to build Virtual Private Networks ('**VPNs**') that allow organisations to link business sites together, including data centres, so that offices can exchange data and access corporate applications. This also allows retail organisations to offer a multiplicity of services to business and retail consumers via the internet or data networks.
- 2.5 Apart from supporting the provision of various retail services, WHQA services can also be important network inputs for SPs themselves. In this respect, SPs can use WHQA services to extend the physical reach of their networks, including for backhauling data and/or voice traffic. This, in turn, enables them to provide a range of fixed and/or mobile communications services to consumers and business customers. Some SPs may also use WHQA as inputs to the provision of other wholesale services.
- 2.6 Currently, there are a number of SPs supplying wholesale (and retail) leased line services in Ireland, including Airspeed, BT Ireland, Colt, Eircom, enet, Verizon, Viatel (Digiweb) and Virgin Media, amongst others.
- 2.7 Arising from the analysis, ComReg has prospectively identified the following three, separate, WHQA markets (together the '**Relevant WHQA Markets**'):
 - (a) A Low Bandwidth Traditional Interface ('**TI**') WHQA Market consisting of all wholesale leased lines carried over analogue, digital and TDM⁵³ technology interfaces with bandwidths $\leq 2\text{Mb/s}$, with this market being national in its geographic scope (the '**Low Bandwidth ('LB') TI WHQA Market**');

⁵³ Time Division Multiplexing.

- (b) A High Bandwidth TI WHQA Market which consists of all wholesale leased lines provided over a TDM interface with bandwidths >2Mb/s, with this market being national in its geographic scope (the '**High Bandwidth ('HB') TI WHQA Market**'); and a
 - (c) Modern Interface ('**MI**') WHQA Market consisting of all wholesale leased lines of any bandwidth carried over modern technology interfaces such as Ethernet, xWDM⁵⁴ and other high bandwidth interfaces, with this market being national in its geographic scope (the '**MI WHQA Market**').
- 2.8 The above Relevant WHQA Markets do not distinguish between the different types of transmission media (wireless, fibre, copper) used to provide these wholesale LLs, i.e. they are transmission media neutral.
- 2.9 Having defined the Relevant WHQA Markets, ComReg then assesses the extent of competition within each of these markets in order to identify whether any SP has Significant Market Power ('**SMP**'). Where SMP is found in a Relevant WHQA Market, ComReg proposes the imposition of regulatory obligations on an SMP SP in order to address competition problems that would be likely to arise absent regulatory invention. Where regulatory intervention is warranted, it is ultimately designed to promote the development of effective competition in the provision of retail and/or wholesale services. The ultimate beneficiaries of competition, supported by regulation, are retail consumers who can then benefit in terms of the increased choice of SPs and higher quality retail services at more competitive prices.
- 2.10 In terms of the SMP assessment in the Relevant WHQA Markets, ComReg's preliminary findings are as follows:
- (a) Eircom is likely to have SMP in the Low Bandwidth TI WHQA Market;
 - (b) No undertaking is likely to have SMP in the High Bandwidth TI WHQA Market; and
 - (c) No undertaking is likely to have SMP in the MI WHQA Market.
- 2.11 Having identified, on a preliminary basis that Eircom, has SMP in the Low Bandwidth TI WHQA Market, ComReg proposed to impose a range of obligations upon Eircom designed to address an identified set of competition problems that could occur, absent regulation. Such obligations largely maintain obligations that have been in place to date arising from the previous review of wholesale lease line markets in the 2008 Decision⁵⁵ (and subsequent Decisions).

⁵⁴ Wavelength Division Multiplexing is a technology which multiplexes a number of optical carrier signals onto a single optical fibre by using different wavelengths.

⁵⁵ See "[Market Analysis – Leased Lines Market Review, ComReg Document 08/103, Decision D06/08](#)", dated 22 December 2008 ('**2008 Decision**').

- 2.12 With respect to the High Bandwidth TI WHQA Market and MI WHQA Market, ComReg proposes to withdraw existing regulatory obligations given its preliminary finding that no SP has SMP. In this respect, ComReg has proposed that certain existing obligations would be withdrawn once ComReg makes its final decision, while for others a sunset period of between 6 to 9 months is considered appropriate in order to facilitate a smooth transition to full de-regulation.

Background to the Review

- 2.13 The WHQA market has been identified by the European Commission ('EC') in its 2014 Recommendation⁵⁶ as one of a number of markets which are deemed susceptible to *ex ante* regulation at an EU level.
- 2.14 The WHQA market has, to date, been subject to regulation in Ireland, with the most recent analysis having been completed in 2008 (although there have been amendments to certain obligations since then). Under the 2008 Decision, one single national wholesale terminating segment leased line market, covering a range of technology interfaces, was identified and Eircom was designated with SMP. Eircom has, to date, been subject to a range of regulatory obligations given ComReg identified that it had the ability and incentive to behave in an anti-competitive manner.
- 2.15 Given the time that has elapsed since ComReg's previous analysis of the 2008 Wholesale Leased Line Market and, having regard to market developments, including the publication by the European Commission of the 2014 Recommendation, it is now considered appropriate to carry out a further market review.

Retail Market Assessment

- 2.16 In section 3 and 4 of this Consultation ComReg considers the main retail trends and developments and assesses the retail LL markets insofar as it informs ComReg's subsequent assessment of the Relevant WHQA Markets.

Main Retail Trends and Developments

- 2.17 In this respect ComReg has identified the following notable trends since the 2008 Decision which are of potential relevance to the review of the WHQA market(s):
- (a) At the time of the 2008 Decision, the significant majority of retail LLs were provided over legacy analogue and TDM technology interfaces. However, since then there has been a significant shift towards more modern interfaces such as Ethernet and xWDM technologies. However, there remains a significant cohort of end-users who remain on analogue and TDM based LLs.

⁵⁶ Corresponding to Market 4 in the European Commission's 2014 Recommendation.

- (b) The demand for retail LLs from the non-commercial sector, in particular, the public sector, has also grown since the 2008 Decision.
- (c) There has been a significant increase in the use of wireless point-to-point ('P2P') radio links to deliver retail LL services. Wireless retail LL circuits accounted for 17.3% of all retail LL in 2015, up from 12.4% in 2013;
- (d) Retail LLs are now being used to support an increased range of ICT services including cloud storage/computing, data, voice and other services; and
- (e) There is evidence of increased availability of fibre infrastructure, not only from Eircom, but also a number of other SPs, with a large proportion of retail LLs being delivered by SPs on their own networks (rather than via wholesale LLs purchased from other SPs).

Retail Market Definition

- 2.18 Section 4 of the Consultation ComReg defines retail LL markets for the purpose of informing the upstream analysis of the WHQA markets. In this context ComReg proposes to define retail LL markets as follows (these market definitions largely mirror the Relevant WHQA Markets identified in paragraphs 2.7 given wholesale demand is typically derived from retail demand):
- (a) Low Bandwidth Traditional Interface ('TI') Retail Market consisting of all retail leased lines carried over analogue, digital and TDM interfaces with bandwidths of ≤ 2 Mb/s, with this market being national in its geographic scope (the '**Low Bandwidth ('LB') TI Retail Market**'); and
 - (b) High Bandwidth TI Retail Market which consists of all wholesale leased lines provided over a TDM interface with bandwidths > 2 Mb/s, with this market being national in its geographic scope (the '**High Bandwidth ('HB') TI Retail Market**').
 - (c) Modern Interface ('MI') Retail Market consisting of all retail leased lines of any bandwidth carried over modern technology interfaces such as Ethernet, EFM xWDM⁵⁷ and other high bandwidth interfaces, with this market being national in its geographic scope (the '**MI Retail Market**');
- 2.19 The above product markets (together referred to as the '**Relevant Retail Markets**') do not distinguish between the different types of media (wireless, fibre, copper) used to provide retail LLs. i.e., they are transmission media neutral.
- 2.20 The rationale and analysis to support the above definitions of the Relevant Retail Markets is discussed throughout section 4 of the Consultation.

⁵⁷ Wavelength Division Multiplexing is a technology which multiplexes a number of optical carrier signals onto a single optical fibre by using different wavelengths.

WHQA Market Definition and SMP Assessment

Definition of the WHQA Markets

- 2.21 In Section 5 of the Consultation ComReg considers the definition of the relevant WHQA market(s) from a product and geographic perspective. This wholesale analysis is also informed by ComReg's assessment of the retail trends and the retail market in Sections 3 and 4.
- 2.22 As noted in paragraph 2.6 above, ComReg proposes to define three separate WHQA markets having regard to an assessment of demand-side and supply-side constraints in the WHQA markets, as well as the effectiveness of indirect constraints emanating from the Relevant Retail Markets. These markets are summarised below.
- (a) a national **Low Bandwidth TI WHQA Market** consisting of analogue and TDM wholesale LLs with bandwidths $\leq 2\text{Mb/s}$;
 - (b) a national **High Bandwidth TI WHQA Market** consisting of TDM wholesale LLs with bandwidths $> 2\text{Mbs}$, and
 - (c) a national **MI WHQA Market** consisting of all Ethernet, xWDM (and other high bandwidth interfaces) LLs of any bandwidth.
- 2.23 The above Relevant WHQA Markets do not distinguish between the different types of transmission media (wireless, fibre, copper) used to provide these wholesale LLs, i.e. they are transmission media neutral.
- 2.24 With respect to the MI WHQA Market, ComReg notes that it carried out a an in-depth analysis to assess whether or not there were sufficient differences in competitive conditions between Business Parks on the one hand (where there is the greater potential for aggregation opportunities given business density economies) and the rest of the country on the other. ComReg's preliminary view is that, while there are some differences in competitive conditions, these are insufficient to warrant the delineation of separate geographic markets.
- 2.25 The rationale and analysis to support the above definitions of the Relevant WHQA Markets is discussed throughout section 5 of the Consultation.

SMP Assessment in the Relevant WHQA Markets

- 2.26 In Section 6 of the Consultation, ComReg assesses whether, absent regulation, any undertaking has SMP in any of the Relevant WHQA Markets, that is, the ability to act, to an appreciable extent, independently of its competitors, customers and consumers.
- 2.27 In this respect, ComReg has examined a number of factors relating to existing competition, potential competition and the strength of any strong buyers. ComReg's preliminary view is that:
- (a) **Low Bandwidth TI WHQA Market:** Eircom is likely to have SMP;
 - (b) **High Bandwidth TI WHQA Market:** No SP is likely to have SMP; and

- (c) **MI WHQA Market:** No SP is likely to have SMP.

Low Bandwidth TI WHQA Market SMP Assessment

- 2.28 Low Bandwidth TI WHQA demand is in slow decline with the number of circuits declining from approximately 9,300 in 2013 to approximately 5,800 in 2015. The demand for these circuits is likely to gradually decline further over the lifetime of this market review as retail (and consequently) wholesale demand is ultimately migrated to the MI LLs.
- 2.29 ComReg is of the preliminary view that Eircom is likely to have SMP in the Low Band TI WHQA Market. This is due to factors such as its high (and increasing) market share, its control of infrastructure not easily duplicated, the lack of potential competition and the absence of effective CBP.
- 2.30 Eircom had a MGF market share at the end of 2015 well in excess of 50%. There is only one other main SP active in the Low Bandwidth TI WHQA Market, namely BT, with a market share less than 15%.
- 2.31 Furthermore, as these TI LLs are of a legacy technology nature it is unlikely that any SP will invest in providing such services in the future, with negligible anticipated new demand.
- 2.32 Eircom's ubiquitous copper network which it uses to provide these services is unlikely to be replicated by other SPs. As such, potential competition is not likely contribute towards effective competition for the duration of this review.

High Bandwidth TI WHQA Market SMP Assessment

- 2.33 In 2015 there were less than 250 High Bandwidth TI WHQA LL circuits in-situ with minimal new demand for such LLs.
- 2.34 Given the low and declining volumes in this market, market shares in and of themselves are not a reliable indicator of competition. In the context of a small and declining market, ComReg is of the preliminary view that no SP has SMP and that continued regulation of this market is not proportionate or justified.

MI WHQA Market SMP Assessment

- 2.35 The MI WHQA market continues to grow with over 12,600 such LLs in place at the end of 2015 having grown from circa 9,500 LLs in 2013 (using circuit counting Method 2⁵⁸).
- 2.36 ComReg notes that no SP has an overall market share above 35%, with 3 SPs other than Eircom having market shares in excess of 10%. The significant majority of LLs are now provided by SPs on their own networks ('**on-net**'), with approximately 3%⁵⁹ of retail LLs reliant on the purchase of MI WHQA LLs from Eircom.

⁵⁸ See Appendix: 3 for a description of ComReg's approach to circuit count methods.

⁵⁹ Less than 15%.

- 2.37 Furthermore, ComReg has observed evidence of increased infrastructure based competition via enet's managed Metro Area Networks ('**MANs**') on which other SPs have interconnected and taken duct and dark fibre access. Furthermore, many other SPs including for example, BT, Colt, Vodafone, Virgin Media have built infrastructure to service businesses in the Greater Dublin area and other areas of high demand for LLs such as in Business Parks and data centres around the country.
- 2.38 ComReg undertook an analysis of connectivity to business parks and 3rd level campuses throughout the State and identified parks where 3 or more fixed network SPs were present (wireless LL SPs were also present at a number of such sites). We identified 209 such locations and it was found that no SP had a market share greater than 25%⁶⁰, collectively, in these 209 areas.
- 2.39 Furthermore, outside of these 209 business park and data centre areas of high concentrated demand, ComReg notes that SPs have achieved wholesale physical access to many of the enet operated MANs in 94 urban centres and used as well as using P2P radio links to provide LLs.
- 2.40 Given the number of competing SPs, the scale and scope of infrastructure based competition (suggesting entry barriers have lowered and appear to have been overcome) in this market, along with the market shares of the competing SPs, it is considered unlikely that any SP has SMP in the MI WHQA Market.
- 2.41 The rationale and analysis to support the above definitions and assessment of the Relevant WHQA Markets is discussed throughout Section 5 and 6 of the Consultation.

Competition Problems and Remedies

Competition Problems in the LB TI WHQA

- 2.42 In Section 7 of the Consultation ComReg identifies potential competition problems that could arise, absent regulation, from Eircom's ability and incentive to exercise market power in the LB TI WHQA Market (and related markets). In the absence of regulation in this market, we consider that Eircom would have the ability and incentive to engage in a range of anti-competitive behaviours including: excessive pricing (including with respect to charges for SPs); vertical leveraging behaviours into downstream markets; and horizontal leveraging behaviours with a view to negatively impacting the position of its competitors in adjacent markets within which Eircom also competes.

⁶⁰ Using counting method 3 (all physical ends counted) as explained in Appendix: 3. This figure applied to Retail, Wholesale and Modified Greenfield calculations.

Remedies in the LB TI WHQA Market

- 2.43 In order to address these competition problems, in Section 8 of the Consultation ComReg proposed to impose upon Eircom a range of access, non-discrimination, transparency, price control/cost accounting and accounting separation obligations in the LB TI WHQA Market. Such obligations largely mirror the obligations already in place.
- 2.44 However, ComReg proposes to impose remedies for TDM based wholesale Partial Private Circuits ('PPCs') only. This is because in relation to the two other LB TI WHQA LL products (analogue and end-to-end WLLs):
- (a) retail digital LLs can be replicated by an Access Seeker having access to a PPC; and
 - (b) There are currently 4 Analogue wholesale LLs in-situ from Eircom, the most recent of these installed in 2002.
- 2.45 As such, ComReg is of the view that it is reasonable and proportionate to impose the suite of obligations identified in Section 8 and to impose them only in respect of TDM based WHQA PPCs.
- 2.46 The detail of these obligations, which are ultimately designed to ensure effective competition in retail and adjacent wholesale markets, is set out in Section 8 of the Consultation.

Next Steps

- 2.47 ComReg invites views from interested parties on the issues analysed in this Consultation, with the procedure and deadline for the submission of responses set out in paragraph 1.55 above.
- 2.48 To facilitate a smooth transitional period to de-regulation, in Section 9 of this Consultation, ComReg has proposed that a 6 to 9 month sunset period for the withdrawal of the majority of existing remedies relating to LLs provided in the High Bandwidth TI WHQA Market and the MI WHQA Market might be reasonable and proportionate. ComReg has also proposed that, during this sunset period, no new requests for access to such LLs would have to be met by Eircom in an SMP regulatory context.

3. Retail Market Trends and Developments

Introduction

- 3.1 Before defining the precise boundary of the WHQA LL market(s) in terms of both the product and geographic scope, and then assessing the strength of any competitive constraints in such market(s), ComReg first reviews recent retail trends in the supply of retail LL in Ireland. ComReg notes that demand for wholesale LL services is ultimately derived from consumer demand for retail LL services although as noted in paragraph 1.11 above, SPs are also purchasing wholesale LL services in order to build their own networks as well as to supply fixed or mobile backhaul. The trends discussed in this section are, therefore, potentially relevant when analysing the wholesale LL market(s). The key trends and developments are examined under the following headings:
- (a) Providers of retail LL services (discussed in paragraphs 3.3 to 3.26 below);
 - (b) Move from analogue and TDM based retail LL to Ethernet based retail LL (discussed in paragraphs 3.27 to 3.34)
 - (c) Demand for LL services from non-commercial (State) sector (discussed in paragraphs 3.35 to 3.37);
 - (d) Increasing take-up of wireless Ethernet retail LLs (discussed in paragraphs 3.38 to 3.43);
 - (e) Growth in the take-up of higher bandwidth LLs (discussed in paragraphs 3.44 to 3.47);
 - (f) Tendency for RLL to be purchased in a bundle with other services (discussed in paragraphs 3.48 to 3.50);
 - (g) Increasing availability of fibre infrastructure (discussed in paragraph 3.51); and
 - (h) Fibre Network deployment by SPs (discussed in paragraphs 3.52 to 3.67).
- 3.2 ComReg's overall preliminary conclusions on the main retail trends and developments since the 2008 Decision is set out in paragraph 3.68.

Providers of Retail Leased Line services

3.3 Table 1 below lists operators that currently provide retail LL services in Ireland⁶¹. These SPs provide services using own-network ('on-net') infrastructure (i.e. own local access infrastructure and/or upstream 3rd party physical infrastructure)⁶² and/or services based on other SPs' managed inputs ('off-net') (i.e. where SPs use a leased line provided by a third party LL supplier to connect between the customer premises and the SPs network). SPs can rent wholesale leased lines from both Eircom and other SPs.

Table 1: Providers of retail LL services

SP	Technology	Infrastructure	Presence at wholesale market	Geographic coverage
Airspeed	Ethernet	Wireless	Yes	National
AT&T	Ethernet	None (re-seller only)	No	NA
BT	Ethernet & xWDM /TDM & Analogue	Fixed	Yes	National
COLT	Ethernet & xWDM /TDM	Fixed	Yes	Dublin area
Digiweb / Viatel	Ethernet & xWDM	Fixed and Wireless	Yes	National
Eircom ⁶³	Ethernet & xWDM /TDM & Analogue	Fixed	Yes	National
enet	Ethernet & xWDM	Fixed	Yes	National
EU Networks	Ethernet & xWDM	Fixed	Yes	Mainly Dublin area
Fulnett/Strencom	Ethernet	None (re-seller only)	No	NA
Host Ireland	Ethernet	Fixed and Wireless	Yes	Dublin area
Magnet	Ethernet	Fixed	Yes	Quasi-national
Three	Ethernet	Wireless	Yes	National
Virgin Media	Ethernet & xWDM /TDM	Fixed and wireless	Yes	Quasi-national
Verizon	Ethernet & xWDM TDM	Fixed	Yes	Quasi-national
Vodafone	Ethernet & xWDM /TDM	Fixed and Wireless	Yes	National

3.4 As can be seen from Table 1, many (although not all) SPs active in the retail LL market(s) in Ireland are also active in a relevant WHQA market(s).

⁶¹ ComReg notes that this is not an exhaustive list of all authorised operators providing LL services in Ireland.

⁶² On-net means that the access portion of the line was either delivered entirely and exclusively based on the SP's own local access infrastructure (e.g. SP fixed wire or wireless media to connect the customer premises to its network) or SP's use of upstream physical infrastructure inputs such as dark fibre or LLU connected between a SP's active equipment.

⁶³ Eircom's network is assumed to be ubiquitous for the purposes of this review given the national footprint of its under and over-ground infrastructure. Other networks are assumed to be national where they have established POPs and presence in all provinces and many regional centres e.g. BT Ireland and eNet etc.

- 3.5 For the purposes of the analysis in this Consultation, LL SPs can be broadly categorised into three types having regard to the extent of the coverage of their own networks and the extent to which they depend on the use of wholesale services provided by other SPs to provide their retail and/or wholesale LL services⁶⁴:
- (a) **Own network SPs**⁶⁵: these SPs provide retail and/or WHQA predominantly using their own network and associated infrastructure and, hence, are not heavily reliant on the use of wholesale inputs provided by other SPs when offering retail and/or wholesale LL services. Examples of such operators currently include Eircom Ltd. (**'Eircom'**)⁶⁶, e-Nasc Eireann Teoranta (**'enet'**)⁶⁷, Virgin Media Ireland Ltd. (**'Virgin Media'**)⁶⁸, Airspeed Communications (**'Airspeed'**)⁶⁹, and Digiweb Ltd. (**'Digiweb'**)⁷⁰.
 - (b) **Wholesale LL purchasers**: these are partially independent operators who purchase wholesale inputs in the wholesale LL market (from wholesale LL providers including Eircom) and use them in conjunction with their own network inputs to provide LL services in the retail and/or wholesale markets. Examples of such operators currently include BT Ireland Ltd. (**'BT'**)⁷¹, Verizon Ireland Ltd. (**'Verizon'**), Vodafone Ireland Ltd. (**'Vodafone'**)⁷² and Colt Technology Services Ltd. (**'Colt'**)⁷³.
 - (c) **Resale retail LL SPs**: these are SPs whose supply of retail LL services does not involve the use of their own physical network. These SPs purchase wholesale access from a third party provider (usually Eircom) and either resell LL under their own brand or re-sell it to another SP who in turn then re-sells that service in the retail market under their own brand. Such operators include AT&T Global Network Services Ltd.⁷⁴ (**'AT&T'**) and Fulnett Ltd.⁷⁵ (**'Fulnett'**).

⁶⁴ Please note that retail LL SPs listed in this Section are not intended as an exhaustive list of all active suppliers of LL services in Ireland at present, but are rather included as the principal suppliers.

⁶⁵ It should be noted that there is no truly independent retail LL SP as all SPs purchase wholesale circuits from other SPs. As such, this list includes those SPs whose retail circuits are predominantly on-net.

⁶⁶ Further information is available at <https://www.eir.ie/>.

⁶⁷ Further information is available at <http://www.enet.ie/>.

⁶⁸ Further information is available at <https://www.virginmedia.ie/>.

⁶⁹ Further information is available at <http://airspeed.ie/>.

⁷⁰ Further information is available at <http://www.digiweb.ie/>. Note that Digiweb is now part of Viatel.

⁷¹ Further information is available at <http://www.btireland.com/>.

⁷² Further information is available at <http://www.vodafone.ie/>.

⁷³ Further information is available at <http://www.colt.net/>.

⁷⁴ Further information is available at <http://www.corp.att.com/emea/where/ireland.html>.

⁷⁵ Further information is available at <http://www.strencom.net/>.

- 3.6 Figure 4 and Figure 5 below provide SPs' market shares⁷⁶ as calculated based on overall retail LL circuit volumes and revenues.⁷⁷ SPs with more than a 2% market share are individually highlighted in the chart below. All those operators with market shares below 2% are grouped together under the heading 'OAOs'.
- 3.7 As noted in Table 2, these market shares indicate a change in the HHI⁷⁸ for the retail LL markets as follows:

Table 2: HHI by circuit volumes and revenues

	2008	2013	2014	2015
Market Share Circuit Volumes	0.6620	0.2464	0.2127	0.1840
Market Share Revenues⁷⁹	0.3122	0.4468	0.1596	0.1476

- 3.8 As such, the HHIs illustrate that the retail markets are increasingly less concentrated, which suggests that they are becoming increasingly competitive.

⁷⁶ ComReg notes that due to the nature of the retail LL market (relatively few large customers purchasing high number of connections), a significant market share variation is possible where a small number of large customers switch SP.

⁷⁷ Please note that market shares throughout this Consultation are, unless otherwise stated, measured in terms of single ended physical circuits with the exception of the bandwidth analysis where logical bandwidths are measured. For completeness we also measured market shares in terms of physical double ended and logical circuits. These market shares are included in Appendix: 4.

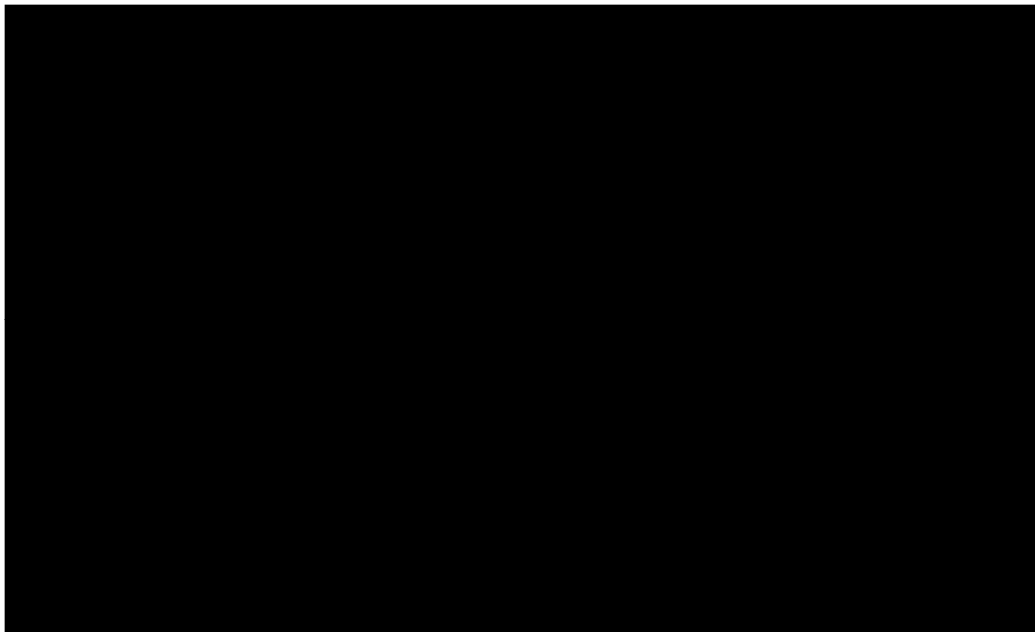
⁷⁸ The Herfindahl Herchshmann Index ('HHI') takes into account the relative size distribution of the firms in a market. It approaches zero when a market is occupied by a large number of firms of relatively equal size and reaches its maximum of 10,000 points when a market is controlled by a single firm. The HHI increases both as the number of firms in the market decreases and as the disparity in size between those firms increases. Market concentrations based on HHIs are classified as follows: (a) unconcentrated Markets: HHI below 0.15; (b) Moderately Concentrated Markets: HHI between 0.15 and 0.25; and (c) Highly Concentrated Markets: HHI above 0.25

⁷⁹ ComReg does not consider revenues to be a reliable indicator of market share. The reasoning for this is set out in Appendix: 3.

Figure 4: SP market share of active retail LL circuits ✕[REDACTED]



Figure 5: SP market share of revenue from the provision of retail LL services (€'000s) ✕[REDACTED]



Eircom

- 3.9 Eircom⁸⁰ is currently the largest provider of retail LL services in Ireland. It owns and operates a ubiquitous Public Switched Telephone Network ('PSTN') and an Integrated Services Digital Network ('ISDN') (together called a 'narrowband network'). Eircom also operates and continues to deploy a Next Generation Access ('NGA') network which ultimately will likely replace Eircom's narrowband network in areas where it is economically viable for it to do so⁸¹. These narrowband and NGA networks are used by Eircom to provide a range of services, including retail LLs, fixed phone and broadband services, to business and residential customers.
- 3.10 In addition to historically providing traditional analogue and TDM⁸² technology based LL services, in 2010 Eircom launched retail and wholesale NGN Ethernet based LL services. More recently, Eircom launched LL services based on a DWDM technology.⁸³
- 3.11 Eircom's retail LL market shares measured in terms of retail LL circuits and revenues respectively has declined steadily since the 2008 Decision. In Q4 2015 Eircom had \times [REDACTED]⁸⁴ of all retail LL circuits, down from \times [REDACTED]⁸⁵ in Q4 2014 and down from \times [REDACTED]⁸⁶ in Q3 2008. Eircom's retail LL revenue market share was equal to \times [REDACTED]⁸⁷ in Q4 2015 down from \times [REDACTED]⁸⁸ in Q4 2014 and \times [REDACTED]⁸⁹ in Q3 2008⁹⁰. In this respect, ComReg notes that there were a total of 15,953 Retail LL circuits in Q4 2015, up from 9,380 circuits in Q3 2008.⁹¹

⁸⁰ Note that Eircom's retail arm trades under the brand 'Eir', while its wholesale arm trades under the brand 'openeir'.

⁸¹ See <http://fiberrollout.ie/where-and-when/> for further details on Eircom's NGA network roll-out plans.

⁸² TDM refers to both PDH and SDH (Plesiochronous and Synchronous Digital Hierarchies). See http://www.openeir.ie/Products/Data/Leased_Lines/ for more details

⁸³ See http://www.openeir.ie/Products/Data/Leased_Lines/ for details.

⁸⁴ Less than 35%.

⁸⁵ Less than 40%.

⁸⁶ Greater than 75%.

⁸⁷ Less than 30%.

⁸⁸ Less than 30%.

⁸⁹ Less than 40%.

⁹⁰ These figures are based on information obtained by ComReg from authorised operators via Statutory Information Requests.

⁹¹ ComReg Analysis of Market Data.

- 3.12 In addition to its national TDM network, Eircom owns and operates a national Next Generation fibre based ('**NGN**') and Wave Division Multiplexed ('**xWDM**')⁹² core and access LL network and to date it has been the largest single supplier of Wholesale LL services.

BT

- 3.13 BT is the second largest provider of retail and wholesale services in Ireland. It owns and operates a national core DWDM network overlaid on fibre which it uses to connect-up its national Ethernet and TDM platforms. Its core network is based on a national duct network leased from Córas Iompair Éireann ('**CIÉ**') with fibre laid along the railway lines with transmission access points at towns located along the routes. It also owns and operates a metro access fibre network which covers business parks and data centres in major cities and some of the smaller towns.
- 3.14 As such, BT can access customer sites by either break out from the metro fibre network or directly from the core fibre network depending on the location of the customer site. In 2014 BT launched Ethernet in the First Mile ('**EFM**')⁹³ services from locations where it has unbundled Eircom's exchanges.⁹⁴
- 3.15 At the same time, BT is also a major purchaser of wholesale LL services. As of Q4 2015, BT had a ✂ [REDACTED]⁹⁵ market share in terms of retail LL circuit volumes and ✂ [REDACTED]⁹⁶ market share in terms of retail LL revenue.

⁹² Dense and Coarse Wave Division Multiplexed ('**CWDM & DWDM**').

⁹³ See <http://bizblog.btireland.ie/bt-launches-enhanced-networking-solutions-business> for details.

⁹⁴ This service allows a range of speeds by the bonding of copper lines.

⁹⁵ Less than 20%.

⁹⁶ Less than 20%.

Vodafone

3.16 Vodafone offers retail LL and wholesale LL services as well as a range of other managed data services (e.g. managed Wide Area Network ('WAN'), Internet Protocol ('IP') and Cloud telephone systems). Vodafone's entry into the LL market was initially facilitated through its acquisition of Interfusion in 2011 as well as the subsequent acquisition of Cable & Wireless and Complete Telecom in 2012⁹⁷. Vodafone is also a major purchaser of Wholesale LL services. These services enable Vodafone to offer retail LL services outside of its own network coverage footprint. ComReg notes that it is also feasible for Vodafone to leverage elements of its substantial fixed backhaul network used to service its national mobile network, in order to satisfy business demand for retail LL services. In the future it is also possible that it could also leverage many of its mobile high site to service its retail LL business. As of Q4 2015, Vodafone had a \times [REDACTED]⁹⁸ market share in terms of retail LL circuits and \times [REDACTED]⁹⁹ market share in terms of retail LL revenue.¹⁰⁰

Verizon

3.17 Verizon operates TDM and Ethernet access networks as well as a Multiprotocol Label Switching ('MPLS') and a fibre network in Dublin.¹⁰¹ In addition it provides retail LL and/or wholesale LL services via leased dark fibre networks in various locations throughout Ireland.¹⁰² Verizon is also a major purchaser of wholesale LL services. In Q4 2015 Verizon had a \times [REDACTED]¹⁰³ market share in terms of retail LL circuit volumes and \times [REDACTED]¹⁰⁴ market share in terms of retail LL revenue.

⁹⁷ See brief overview of services provided by acquired companies SPs - <http://www.vodafone.ie/medium-large-business/why-vodafone/acquisitions/>.

⁹⁸ Less than 15%.

⁹⁹ Less than 15%.

¹⁰⁰ Source: ComReg Data based on SP submissions to Statutory Information Requests.

¹⁰¹ \times [REDACTED]

¹⁰² Such as from enet, Aurora, ESBT, etc.

¹⁰³ Less than 15%.

¹⁰⁴ Less than 20%.

Digiweb/Viatel and Airspeed

- 3.18 Digiweb¹⁰⁵ and Airspeed are the two largest suppliers of wireless Ethernet technology based retail LL services. Digiweb provides retail LL services via its own national network of radio high sites and uses ESB's¹⁰⁶ fibre core network as its national backhaul solution. Digiweb also utilises its fibre infrastructure in Dublin and a significant number of other major cities and towns where the Metropolitan Area Networks ('MAN's') are present. In addition, Digiweb provides EFM services from locations where it has unbundled Eircom exchanges. Digiweb also purchases wholesale LL and dark fibre services from multiple SPs in various locations.
- 3.19 Airspeed provides nationwide retail LL services by utilising fixed point-to-point microwave links ("P2P Radio Links") and Fixed Wireless Access Local Area ('FWALA') radio links. It also owns and operates DWDM fibre core network between connected data centres within Dublin. Airspeed and Digiweb purchase wholesale LL services from multiple SPs to provide network backhaul from its regional points of presence ('PoPs') in addition to using their own P2P wireless links for this purpose. In 2014 Airspeed was acquired by one of enet's owners¹⁰⁷, but it continues to provide retail LL services under the Airspeed brand¹⁰⁸.
- 3.20 Digiweb's and Airspeed's presence has grown significantly since the 2008 Decision. Digiweb and Airspeed supply wholesale and retail LLs predominantly using wireless infrastructure and are the main suppliers of retail LLs using such technology. As of Q4 2015, Digiweb and Airspeed had \times [REDACTED]¹⁰⁹ and \times [REDACTED]¹¹⁰ in terms of retail LL circuits respectively. When measured in terms of retail LL revenue Digiweb's and Airspeed's respective market shares stood at \times [REDACTED]¹¹¹ and \times [REDACTED]¹¹² at the end of 2015.

¹⁰⁵ Also known as Viatel.

¹⁰⁶ Further information is available at <https://www.esb.ie/our-businesses/telecoms/telecoms-overview>.

¹⁰⁷ See <http://airspeed.ie/media-centre/news/telecoms-investor-granahan-mccourt-capital-acquires-airspeed-telecom>.

¹⁰⁸ A Joint Operating Agreement ('JOA') exists between enet and Airspeed. See <https://www.telecomtvtracker.com/insights/telecoms-investor-granahan-mccourt-capital-completes-integration-of-enet-and-airspeed-telecom-networks-to-create-single-national-platform-delivering-gigabit-connectivity-3258/>.

¹⁰⁹ Less than 10%.

¹¹⁰ Less than 10%.

¹¹¹ Less than 10%.

¹¹² Less than 10%.

Colt

- 3.21 Colt provides a variety of retail and wholesale LL TDM and Ethernet based services as well as dark fibre services. Colt owns and operates DWDM network in the Dublin metropolitan area. As of Q4 2015, Colt had a \llcorner [REDACTED]¹¹³ market share in terms of retail LL circuits and \llcorner [REDACTED]¹¹⁴ market share in terms of retail LL revenue.

Virgin Media

- 3.22 Virgin Media¹¹⁵ operates a Wave Division Multiplexed ('xWDM') core network and a DOCSIS 3 Hybrid Fibre Cable ('HFC') network which requires fibre connectivity to its "street nodes". It also has access to many point-to-point wireless high-sites (used for backhaul services). It has leveraged these assets to offer wholesale and retail LL point-to-point services. In Q4 2015 Virgin Media had a \llcorner [REDACTED]¹¹⁶ market share in terms of retail LL circuits and \llcorner [REDACTED]¹¹⁷ market share in terms of retail LL revenue.

enet

- 3.23 enet was designated¹¹⁸ by the government as Management Services Entity ('MSE') and is responsible for managing, maintaining and operating MANs on behalf of the State. These MANs are publicly owned, while allowing all telecommunication operators open access to the networks. They are fibre-based and technology neutral resilient networks that are laid in a ring formation in a metropolitan areas. These individual MAN networks are connected to "co-location centres". In these co-location centres, SPs can locate their telecommunications equipment and thereby link to premises close to the MAN. Thus, the MANs can be used to provide services including telecoms, Internet access, television and closed circuit television ('CCTV') to businesses and consumers in these areas. Under phase 1, 28 Mans were completed while phase 2 completed additional 66 MANs¹¹⁹. As such, there are 94 towns and urban areas with a MAN.

¹¹³ Less than 10%.

¹¹⁴ Less than 10%.

¹¹⁵ Formerly known as UPC.

¹¹⁶ Less than 10%.

¹¹⁷ Less than 10%.

¹¹⁸ enet were awarded a 15-year services contract in June 2004. In July 2009, they were awarded a 15-year services contract to operate and manage the additional Phase 2 MANs.

¹¹⁹See <http://www.dcenr.gov.ie/communications/en-ie/Broadband/Pages/Metroplian-Area-Networks.aspx> for the locations of existing MANs.

- 3.24 enet operates metropolitan rings and offers connectivity to the rings. It also offers connectivity between customer sites. enet offers a full suite of physical and active products including ducting, sub-ducting, dark fibre, high level managed capacity, co-location facilities and relevant auxiliary services. enet has also built its own independent MAN in Castlebar which is outside the scope of the State funded MAN network and has recently acquired access to [REDACTED] ¹²⁰.

ESBT

- 3.25 ESB Telecom ('**ESBT**')¹²¹ was established in 2001 as a wholly-owned subsidiary of the Electricity Supply Board ('**ESB**'). It has been a beneficiary of government funding for network construction under the National Development Plan. ESB Telecom has built and owns a 2,000 km fibre optic network, constructed in a "figure of 8" around Ireland plus a Northern Spur to the Northwest of Ireland. The vast proportion of this network comprises aerial fibre wrapped on ESB's High Voltage electrical network. During 2014/2015 ESBT has rolled out a new DWDM network which mirrors the existing network. ESBT offers managed bandwidth services and dark fibre at a wholesale level and supplies high to very high capacities on its national core network. ESBT also offers managed LL services using P2P radio links from its 400 towers throughout the State for which it also offers backhaul services.¹²²
- 3.26 Having described, in general terms, the main SPs offering retail and/or wholesale LL services, the remainder of this section outlines relevant headline trends and developments that have occurred since the 2008 Decision.

¹²⁰ As noted in paragraph 3.19, enet also acquired Airspeed in 2014.

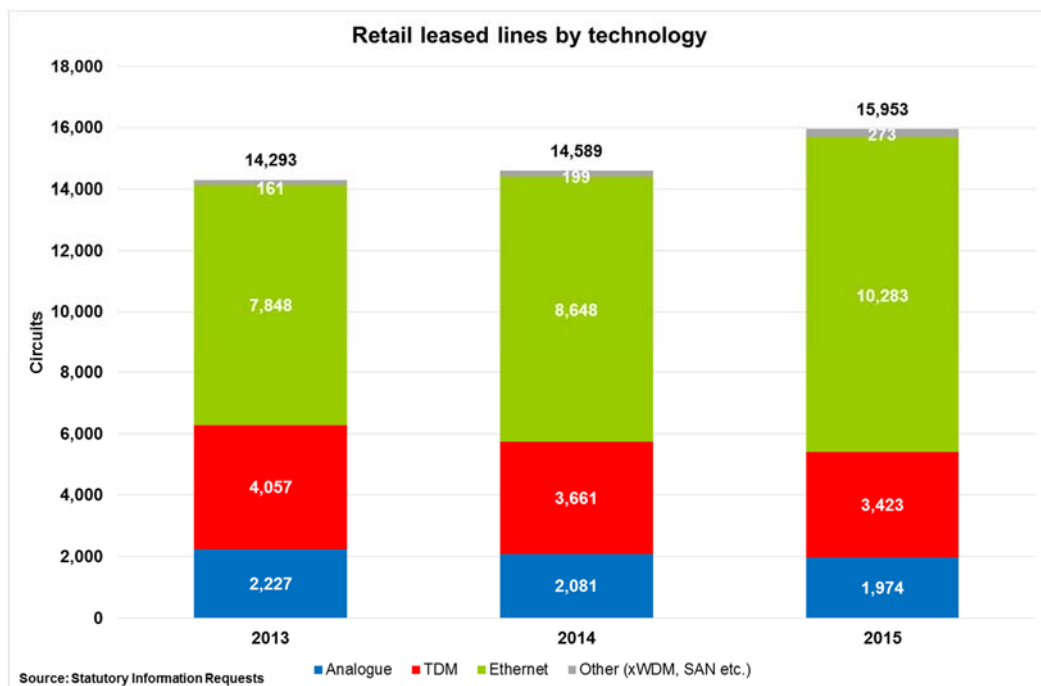
¹²¹ <https://www.esb.ie/our-businesses/telecoms/telecoms-overview>.

¹²² <https://esb.ie/docs/default-source/telecoms/esb-telecoms-ltd-licenced-microwave-radioebf7592d46d164eb900aff0000c22e36.pdf?sfvrsn=2>.

Migration from Analogue and TDM (Traditional Interface (TI)) to Ethernet, xWDM and other advanced (Modern Interface (MI)) based LL services¹²³

3.27 An overarching trend since the 2008 Decision has been an overall increase in demand for MI¹²⁴ retail LL services and a steady decline in TI¹²⁵ retail LL services. At the time of the 2008 Decision, the total number of leased line circuits in 2008 was 9,380¹²⁶. Figure 6 below illustrates that the number of retail LL circuits has increased significantly since 2008 and that the demand for retail LL services continues to grow. As of the end of 2015, there were 15,953 retail circuits up from 14,589 one year previously (representing a year-on-year growth of 9.3%) using count Method 2.¹²⁷

Figure 6: Retail LL by technology



¹²³ In Section 5, ComReg preliminarily defines three broad wholesale product markets; a Modern Interface WHQA Market that includes LLs provided over Ethernet, EFM and xWDM interfaces (and other such high bandwidth interfaces); a Low Bandwidth TI WHQA Market that includes TDM, analogue and digital LLs at bandwidths $\leq 2\text{Mb/s}$; and a High Bandwidth TI WHQA Market that includes TDM, analogue and digital LLs at bandwidths $> 2\text{Mb/s}$.

¹²⁴ Modern Interface refers to LL interfaces such as Ethernet, xWDM and other such high bandwidth LL technologies.

¹²⁵ Traditional Interface refers to interfaces such as Analogue, Digital and TDM interfaces.

¹²⁶ Q3 2008 Quarterly Key Data Report.

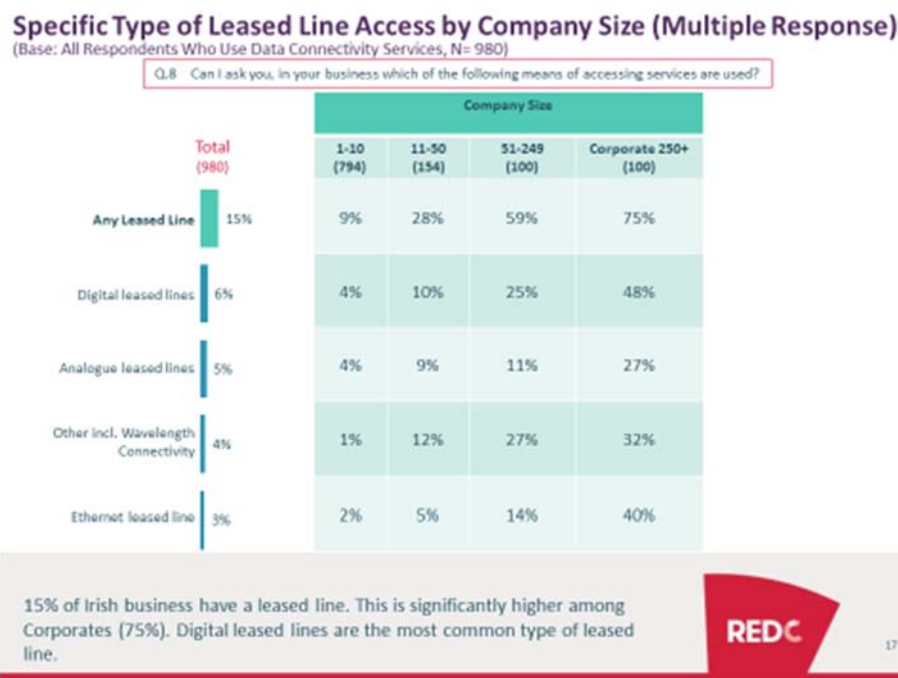
¹²⁷ See Appendix: 3 for a description of ComReg’s approach to circuit count methods.

- 3.28 The growth in demand for retail LL services has occurred in parallel with significant improvements in LL access technologies as well as nature of the services and products being supplied using these access technologies. In 2008 the majority of LLs were TDM circuits based largely on wholesale versions of retail products, connected between customer premises or connected to various services such as Internet Access ('IA'), Frame Relay ('FR'), Asynchronous Transport Mode ('ATM') or Multiprotocol Label Switching ('MPLS') (these various technologies provide enhanced services overlaid on the connected leased lines). These LLs were used to provide connectivity services between customer premises or to the internet.
- 3.29 As highlighted by Figure 6 above, the number of TI based retail LL is in decline as these services are steadily being replaced by retail LL based on fibre and point-to-point wireless Ethernet access technologies as well as other high bandwidth access technologies such as xWDM. The number of legacy traditional interface ('TI') (analogue and TDM) LL circuits had fallen to 5,397 by Q4 2015, a decrease of 6.0% since Q4 2014, while the number of modern interface ('MI') (Ethernet plus other equivalent high bandwidth technologies) LL circuits increased to 10,556, an increase of 19.3% over the same period. Thus, Ethernet (and equivalent technologies) has become the most common access technology with 66.2% of all retail LL circuits in Q4 2015, up from 60.6% in Q4 2014.
- 3.30 The number of orders for various technology access lines also reflect this trend with, for example, only 2% of TDM and analogue retail LLs having been ordered from Eircom in 2015 (2% of orders)¹²⁸ while it received 3% of orders for Ethernet and equivalent technology circuits during the same period (3% of its retail orders). However, ComReg notes that while Ethernet and other circuits now account for the majority of installed LLs in Ireland, it can be observed that there is still a significant number of TI (analogue and digital) retail LLs remaining in-situ. At the end of Q4 2015 TI LLs accounted for 33.8% of all live retail circuits.
- 3.31 Figure 7 below (taken from the 2014 Market Research¹²⁹) shows that TI based retail LL services are the most common type of services purchased by businesses in Ireland with 6% of businesses purchasing Digital (i.e. TDM) LL services and 5% of businesses purchasing Analogue LL services. Only 3% of respondents indicated that they purchase Ethernet and other LL services. Thus, the 2014 Market Research further highlights the continuing importance of Analogue and TDM based (TI) LL services.

¹²⁸ Source: Eircom 2015 Regulated accounts.

¹²⁹ The 2014 Market Research, Slide 17.

Figure 7: LL Types purchased by businesses



- 3.32 The change in retail LL access technologies has fostered the proliferation of cloud services, various e-Commerce services, backup facilities and other retail services such as Software as a Service (**‘SaaS’**) which are now being offered to business of varying sizes on a consumable basis (i.e. on a “pay-as-you-go” basis) and are commonly sold together with retail LL services.
- 3.33 These developments have resulted in a greater concentration of IT infrastructure in large data centres in Ireland. Data centres, in the broadest sense, are premises whose main purpose is to house computing and communications equipment in secure locations and which therefore require very high capacity LL as well as dark fibre to carry data to and from their facilities. These sites tend to have multiple tenants and may be owned and operated by SPs and/or run by third-party providers that are “carrier-neutral”¹³⁰ such as Teletcity,¹³¹ Interxion,¹³² Servcentric,¹³³ Citadel 100,¹³⁴ etc. or “private” data centres operated by content and cloud providers (e.g. Amazon, Google, IBM, HP, etc.).

¹³⁰ Carrier-neutral data centre is a data centre or carrier hotel which allows interconnection between multiple telecommunication carriers and/or colocation providers and allows SPs to offer services to all customers within the data centre. It is usually (though not in all cases) operated and owned by a business entity other than a SP.

¹³¹ See <http://www.teletcitygroup.ie/>.

¹³² See <http://www.interxion.com/>.

¹³³ See <https://www.servcentric.com/>.

¹³⁴ See <http://citadel100.com/>.

- 3.34 Data centres operate at a scale which ensures that the key requirements for IT systems such as power, cooling and security are delivered to multiple customers at a uniformly high quality. They have become major telecommunications hubs in order to provide access to the IT services utilising them. As LL SPs extend their IT core infrastructures to data centres, they become the hubs of their customers' wide-area networks¹³⁵ ('WAN') and thereby, major sources and aggregation points for traffic on their networks. The SPs connected to data centres may service the wholesale and retail customers located within the data centre and as such, customers can readily switch between SPs without having to physically move their servers and other equipment.

Demand for LL services from non-commercial (State) sector

- 3.35 The demand for retail LL from non-commercial sector has also grown significantly since the 2008 Decision. The Department of Public Expenditure & Reform in conjunction with the Government Networks Programme Board has established the Government Networks ('GN')¹³⁶ on behalf of the non-commercial public sector. GN is a private, managed WAN connecting public service agencies via a data, voice and video capable network. GN is designed primarily to facilitate secure and reliable communication between Government agencies and to support existing and future Government applications. A mechanism for providing agencies with a secure access to the Internet is included as well as a means for agencies to securely host Internet services. Examples of agencies procuring connections to the GN include the Department of Health¹³⁷ and the Department of Justice and Equality¹³⁸ that require connectivity between their widely geographically dispersed locations. GN is connected to six retail LL providers¹³⁹ that provide data connectivity services.

¹³⁵ A wide area network is a private network that are present over a number of distinct locations.

¹³⁶ Further information available at <http://ictprocurement.gov.ie/government-networks/>.

¹³⁷ The Department of Health connects the public hospitals alongside primary care centres and the Health Service Executive facilities

¹³⁸ The Department of Justice and Equality connects the court system and stations of An Garda Síochána together.

¹³⁹ & [REDACTED].

- 3.36 Furthermore, in June 2009 the Minister for Communications, Energy and Natural Resources, in collaboration with the Minister for Education and Science, announced the 100Mb/s broadband initiative for post-primary schools¹⁴⁰. HEAnet¹⁴¹ were subsequently appointed to manage the school broadband network which currently provides synchronous 100Mb/s data connectivity as well as managed school router, centralised content filtering, centralised firewalling, anti-virus, and associated IT services to approximately 780 second level schools throughout Ireland. HEAnet also manages the provision of data connectivity services to all State supported 3rd level education institutions in Ireland. Currently these institutions are being provided with a minimum of 1Gb/s bandwidth data connectivity. It also leases dark fibre from various infrastructure providers over which it operators its own high-bandwidth network.
- 3.37 As such HEAnet is one of the largest purchasers of retail LLs in Ireland as it purchases these services across the majority of available bandwidths and across the geography of the State from islands off the Western seaboard to urban high tech campuses.

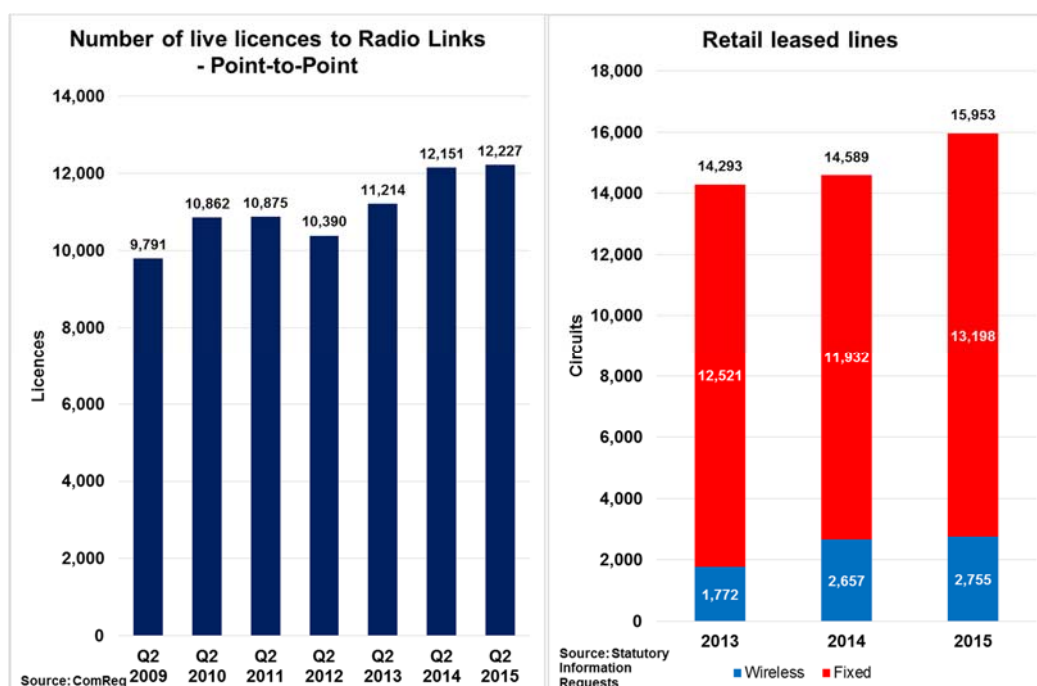
Increasing take-up of wireless (P2P radio) Ethernet retail LLs

- 3.38 A further development in the period since the 2008 Decision has been the growth in the number of based retail LLs provided over point-to-point ('P2P') radio links.
- 3.39 Figure 8 below illustrates that since 2009 there has been a 25% increase in the overall number of P2P radio links licences issued by ComReg to all entities operating wireless links.¹⁴² The use of wireless links by SPs for the delivery of LLs has also increased over the same period. As of Q4 2015 wireless retail LL circuits accounted for 17.3% of all retail LL up from 12.4% in 2013, but down from 18.2% in 2014. However, it should be noted that the number of wireless links used by SPs to deliver retail LL services, has still grown by 98 in 2015 in absolute terms.

¹⁴⁰ Further information is available at <http://www.pdsttechnologyineducation.ie/en/Technology/Schools-Broadband/High-Speed-100Mbit-sec-Broadband-Schools-Programme/>.

¹⁴¹ Further information is available at <http://www.heanet.ie/>.

¹⁴² The number of P2P radio licences is not correlated with the number of wireless based retail LL. This is because each licence represents one hop (or link) in a connection. Furthermore, P2P radio licences can be used for other services such as mobile backhaul, wholesale LLs and resilience purposes and used by other entities other than Service Providers such as Local Authorities. Emergency Services etc.

Figure 8: Growing demand for wireless LLs

- 3.40 Since the 2008 Decision, technological developments associated with the provision of wireless Ethernet retail LLs has reduced the cost of these services. ComReg notes that at present wireless technologies are capable of delivering point-to-point symmetrical connectivity at bandwidths of up to 1 Gb/s depending on the distance between radio high site and the customer premises. Hence, the demand for wireless LL services has increased significantly since the 2008 Decision.
- 3.41 SPs have also increased their usage of P2P radio links rather than purchase a LL from a third party supplier. The decision to install their own wireless link is made on commercial inputs to a “build or buy” decision.¹⁴³
- 3.42 ComReg’s analysis indicates that a significant amount of wireless LLs have been installed by SPs to provide retail services to HEAnet for the ‘Schools 100 Mb/s High-Speed’ programme¹⁴⁴. However, the 2014 Market Research indicated that there is a noticeable demand for wireless LL among businesses too with 26% of respondents indicating that their LL service is provided over wireless network¹⁴⁵. Thus, the demand for wireless LL services is not restricted to only a particular set of end-users (e.g. schools) or geographic areas (e.g. rural areas).

¹⁴³ SP responses to the Qualitative Questionnaire, June 2015

¹⁴⁴ HEAnet noted that approximately 2/3rds of 2nd level schools purchase wireless Ethernet based retail LL services.

¹⁴⁵ The 2014 Market Research, Slide 18.

- 3.43 The product characteristics of wireless LL services compared to other LL technologies are further considered in Section 4 of this Consultation in the context of the Retail Market Assessment¹⁴⁶.

Growth in the take-up of higher bandwidth LLs

- 3.44 The continuous growth in data usage by end-users is resulting in an increasing demand for higher bandwidth LL services. For example, HEAnet notes that data traffic consumed by secondary schools is growing by more than 250% year-on-year¹⁴⁷. This is not unexpected as the general trend is for continuous growth in data traffic in electronic communications markets in general. For example, the annual growth in data volumes generated over mobile networks was 56.6% at the end of Q4 2015.¹⁴⁸
- 3.45 Figure 9 and Figure 10 below highlight this particular trend (using count Method 1)¹⁴⁹. The majority of analogue and T1 circuits deliver speeds of equal to or lower than 2Mb/s¹⁵⁰ while the vast majority of Ethernet circuits are delivering bandwidth in excess of 10 Mb/s. Similarly, the number of circuits based on technologies such as xWDM that are capable of delivering very high bandwidth capacity in excess of 10 Gb/s is also growing with 273 such circuits sold in 2015 up from 199 in 2014.
- 3.46 While the demand for Ethernet based LLs is growing across all bandwidth categories ComReg notes the significant growth in the number of Ethernet circuits delivering 1Gb/s bandwidths which has increased by 147% since 2014, albeit from a low base.

¹⁴⁶ See Section 4 below.

¹⁴⁷ See <http://www.heanet.ie/wordpress/wp-content/uploads/2014/12/FINAL-HEAnet-Infographic.pdf>.

¹⁴⁸ See page 41 in [ComReg Quarterly Key Data Report, Q4 2015](#).

¹⁴⁹ See Appendix: 3 for a description of ComReg's approach to circuit count methods. The 3 different methods described produce slightly different results hence, Fig. 6 totals are different to those presented in Figs.9 & 10.

¹⁵⁰ Approximately 2,000 of these are analogue LLs whereas approximately 3,200 are digital LLs.

Figure 9: Retail LL by Bandwidth

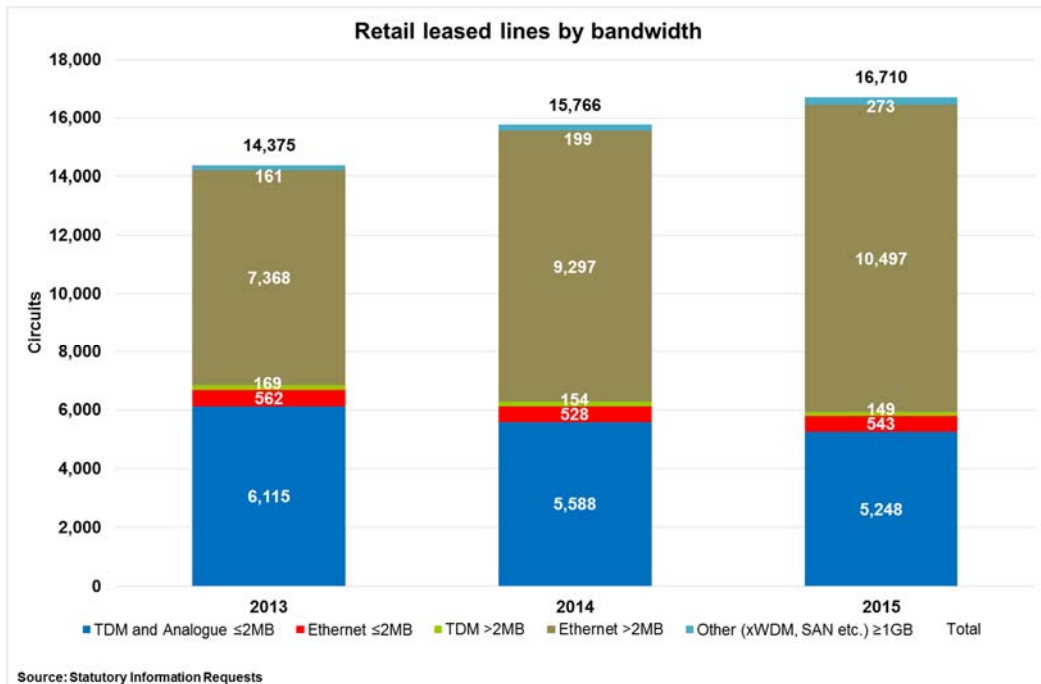
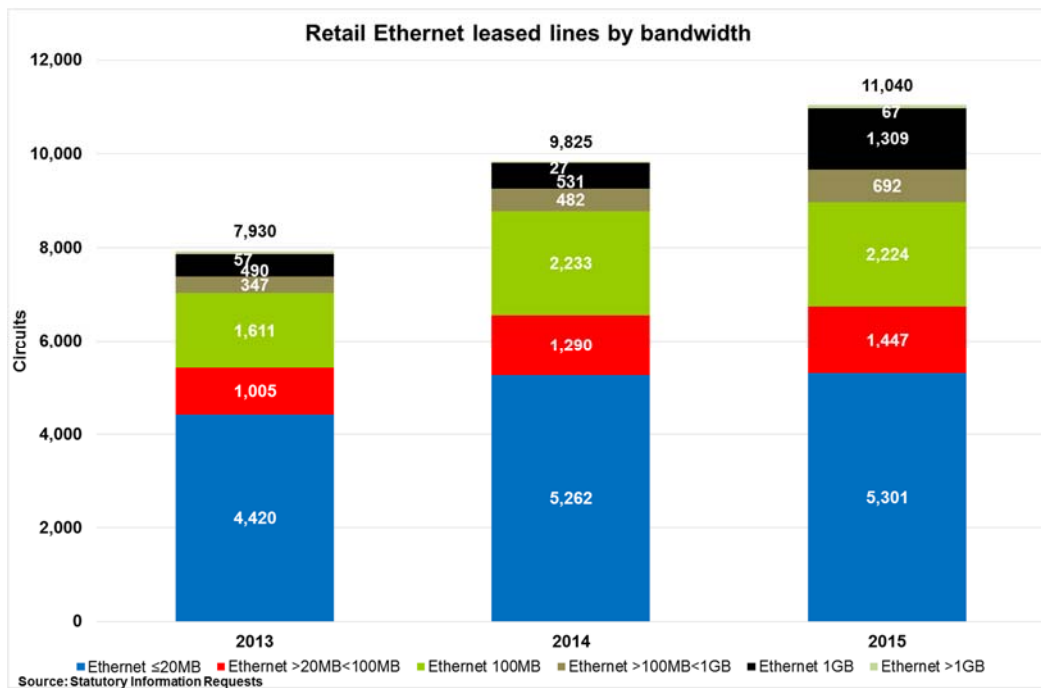


Figure 10: Ethernet Retail LL by Bandwidth



3.47 The majority of SPs that responded to ComReg’s Qualitative Questionnaire¹⁵¹ also highlighted the growing demand for higher bandwidth LL services as one of the key trends that is likely to continue over the period of this market review noting growing sales in the 50-100 Mb/s and ≥1Gb/s categories.

Tendency for retail LL to be purchased in a bundle with other services

3.48 As noted in paragraph 3.28 above at the time of the 2008 Decision end-users were purchasing retail LL services primarily for providing data connectivity between multiple business premises with such services primarily orientated to large companies and public service agencies.

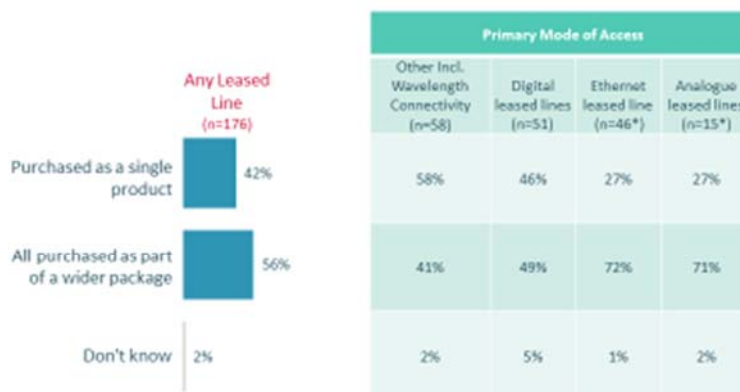
3.49 Figure 11 below highlights businesses’ preferences for purchasing LL as part of a wider network solution or telecoms package. The 2014 Market Research indicated that 56% of surveyed LL service purchasers buy LL as part of a wider package whereas 44% purchased it as a standalone product¹⁵².

Figure 11: Incidence of LL purchased as part of a bundle

Incidence of Bundling Leased Line

(Base: Total Leased Line Users, n = 176)

Q.54/Q.121 Do you purchase leased line services as a single product or as part of a wider network solution or telecoms package?



*Base small

56% of leased line connections are bundled with ethernet and analogue leased lines significantly more likely to be part of a bundle.



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¹⁵¹ In June 2015, ComReg issued qualitative information seeking views and opinions of SPs engaged in the retail and/or wholesale market for LLs. This information was sought on a voluntary non-statutory basis. See paragraph 1.44 for details.

¹⁵² The 2014 Market Research, Slide 106.

- 3.50 As the range of services available over LLs has increased, the amount of bandwidth needed to provide these services has also increased. The following section outlines the network infrastructure developments that have contributed to usage of higher speed retail LLs.

Increasing availability of fibre and wireless infrastructure

- 3.51 Since the 2008 Decision, there have been notable increases in the deployment of networks that can be used to provide retail LLs. These include:
- The deployment of further duct and fibre routes by infrastructure providers Aurora Network¹⁵³ and Inland Fibre (recently acquired by EU Networks)¹⁵⁴.
 - The more widespread use of the Government backed enet MANs and the establishment of enet's independent backhaul network using the national rail network. enet's owners have also recently purchased Airspeed Telecom¹⁵⁵.
 - The establishment and expansion of the footprints of wireless SPs Airspeed Telecom (now owned by enet), Digiweb and Host Ireland.

Fibre Network deployment by SPs

- 3.52 Eircom is continuing to deploy its Next Generation ('NG') network which is the basis of its expanding Next Generation Access ('NGA') solutions, as manifested through its continued rollout of fibre to the cabinet ('FTTC') and fibre to the home/building ('FTTH/B') technologies in selected areas¹⁵⁶. Eircom's FTTC broadband can offer maximum speeds (down/upstream) of up to 100/20Mbps and fixed profiles of 100/30, 300/50 and 1,000/100Mbps for FTTH/B. It claims to have passed 1.4 million premises with its combined FTTC/H rollout with an ultimate target of 1.9¹⁵⁷ million premises as its current published target.

¹⁵³ See <http://www.auroratelecom.ie/> for details.

¹⁵⁴ See <http://www.eunetworks.com/news/eunetworks-acquires-inland-fibre-telecom/> for details.

¹⁵⁵ See Footnote 90.

¹⁵⁶ Initially Eircom's FTTH service was limited to Sandyford and Wexford exchanges. Eircom announced a more widespread rollout for 66 towns covering 300,000 premises in Q4, 2014. FTTH can be used for the provision of retail LLs.

¹⁵⁷ Eircom wholesale website; <http://fibrerollout.ie/where-and-when/>; Retrieved 8 August 2016.

- 3.53 Virgin Media has deployed its DOCSIS 3 network which covers approximately 45%¹⁵⁸ of premises nationwide. Although this infrastructure is utilised to provide broadband to households, it can also be used to provide retail LL services. This has required it inserting fibre deeper into its access network, far closer to business premises than was previously the case and also facilitates the deployment of Ethernet via DOCSIS products along with point-to-point Ethernet services.
- 3.54 In July 2014, ESB and Vodafone Ireland, announced a fully functioning 50:50 Joint Venture named SIRO¹⁵⁹ to build a fibre to the building ('FTTB') network across 50 towns, reaching potentially 500,000 customers, with speeds from 200 Mb/s to 1 Gb/s. The European Commission approved the creation of the Joint Venture Company ('JVCo') in October 2014. The network is being deployed using ESB's existing overhead and underground infrastructure.
- 3.55 ComReg notes that the roll-out of fibre access networks by the operators detailed above can be utilised by SPs to provide retail LLs.

Alternative network rollout for retail LL access

- 3.56 It is important to note that there has been an increase in the investment and availability of alternative wired fibre networks in Ireland since the 2008 Decision. Specifically, BT, Digiweb and Vodafone have significantly extended their network reach in many urban areas. This is especially so in areas of high business activity, such as business parks.
- 3.57 Many operators have developed their networks in the Greater Dublin region and have achieved access and connectivity to all the major business parks in an around the Dublin area. They have leveraged the T50¹⁶⁰ infrastructure and shared network builds¹⁶¹ across Dublin. Many have also purchased/leased duct and/or dark fibre to augment their own independent builds to allow them connect to all significant parks and data centres in Dublin.
- 3.58 The network maps supplied to ComReg by SPs demonstrate this development and show multiple operators present in business parks in areas such as Sandyford, Tallaght, Citywest, Clondalkin, Parkwest, Blanchardstown, Dublin Airport, Santry, Clonshaugh, East Point and the IFSC.

¹⁵⁸ As of Q4 2015 Virgin Media's network passed 772,000 households in Ireland. See <http://www.libertyglobal.com/pdf/press-release/earnings/LG-Earnings-Release-Q4-15-FINAL.pdf>. Penetration is based on Central Statistics Office ('CSO') Q4 2015 estimate of 1,716,600 households in Ireland.

¹⁵⁹ See <http://siro.ie/> for details.

¹⁶⁰ The T50 is an independent duct infrastructure circumnavigating the M50 motorway. It passes and effectively connects all the major business parks around the M50, and Dublin Airport. See http://www.mdmeng.ie/t-50_telecoms_network.php for details.

¹⁶¹ Where two or more operators have shared the cost of major duct routes.

- 3.59 However, such network deployment is not limited to the Dublin area and has occurred throughout the State. Some SPs have achieved national or quasi-national footprints by using various backhaul providers in addition to local enet MAN connectivity. They have leveraged this to connect directly using duct and/or dark fibre to customer sites and importantly, to regional business, technology and retail parks. LLU operators have also used it to unbundle Eircom exchanges.
- 3.60 enet are a wholesale only operator,¹⁶² who under the terms of their MSE award must provide access on a non-discriminatory basis to all authorised operators, including retail LL providers. As such, in the 94 urban areas where they are present, SPs wishing to provide retail LLs have at least a choice between the wired networks of Eircom and enet as well as the services provided by wireless based wholesale SPs. In many of these MAN areas, multiple operators have connected to the MAN network, taking duct and dark fibre access thus extending the reach of their own networks into these towns and cities and thereby, changing the competitive landscape in these locations. Others have purchased LLs directly from enet or other SPs using the MANs and resold these into the retail market.
- 3.61 Since the 2008 Decision, the availability of access on the MANs is an important element contributing towards an increase in competition for supply of retail MI LL services.
- 3.62 enet has also gained access to fibre on the national rail network and to significant fibre infrastructure in \times [REDACTED]. This has allowed it to provide fully independent end-to-end services from many of its MANs to customer sites based \times [REDACTED]. It has also built its own independent MAN in Castlebar.
- 3.63 Importantly, enet can leverage these additional assets, including those acquired in its purchase of Airspeed, to offer competitive propositions in the retail and wholesale spaces.
- 3.64 Furthermore, the increased use of P2P microwave links and the emergence of new wireless operators has also been hugely important. As referred to elsewhere in this document, HEAnet has confirmed that two-thirds of its requirement for circa 780 secondary schools have been provided via wireless links. This is despite it awarding an \times [REDACTED] premium¹⁶³ to fibre based services in its procurement process.

¹⁶² Note that enet provides services directly to HEAnet, which ComReg considers to be retail services as they are provided to an end-user and not a licenced SP.

¹⁶³ Page 30, para 3.4.3, of the [Request for Tender](#) indicated a preference for fibre and the award of marks preference fibre.

- 3.65 Due to the geographically dispersed nature of its requirements,¹⁶⁴ the HEAnet service demonstrates that some wireless SPs have national or near-national footprints. This has been confirmed by the network maps¹⁶⁵ and availability and take-up of high-sites by wireless SPs.
- 3.66 ComReg also notes that the Irish Government has proposed the National Broadband Plan ('**NBP**'), which will support the provision of broadband access to households and businesses that currently fall outside the reach of existing broadband networks. The purpose of the NBP is to ensure that broadband service with a minimum download speed of 30Mb/s is available nationally.
- 3.67 The National Broadband Scheme ('**NBS**') was introduced in 2008 to provide a basic broadband service to residents and businesses within the NBS Coverage Area (predominately rural areas). Under EU State Aid rules, this intervention was time limited, ending in August 2014. In 2012 the Department of Communications, Energy and Natural Resources announced the NBP to rollout broadband to less densely populated areas of Ireland. A detailed procurement process is underway with a view to commencing construction of a wholesale network that would support the provision of broadband services as well as other services such as voice, multicast (to support TV), machine-to-machine ('**M2M**') and LL services¹⁶⁶. It is envisaged that the wholesale network supporting this service could also be leveraged to provide retail LL services.

Overall Preliminary Conclusion on Retail Trends and Developments

- 3.68 Having regard to the discussion in paragraphs 3.1 to 3.67 above, ComReg is of the preliminary view that the most notable retail trends since the 2008 Decision of potential relevance to the review of the WHQA LL market(s) are:
- (a) a significant shift from TDM and analogue LLs towards more modern interfaces such as Ethernet and xWDM technologies. However, there remains a significant cohort of end-users who remain on analogue and TDM based LLs.
 - (b) the demand for retail LLs from non-commercial sector, in particular, the public sector, has also grown since the 2008 Decision.
 - (c) an increase in the use of wireless P2P radio links to deliver retail LL services.
 - (d) retail LLs now being used to support an increased range of ICT services including cloud storage/computing, data, voice and other services; and

¹⁶⁴ 2nd level schools are located in urban, suburban and rural areas.

¹⁶⁵ See see Appendix: 11.

¹⁶⁶For more information see

<http://www.dcenr.gov.ie/communications/Lists/Publications%20Documents/Updated%20Strategy%20December%202015.pdf>.

- (e) There is evidence of increased availability of fibre infrastructure, not only from Eircom, but also a number of other SPs, with a large proportion of retail LLs being delivered by SPs on their own networks (rather than via wholesale LLs purchased from other SPs).

Question 1: Do you agree that the main developments identified above in the provision of retail LLs are those which are most relevant in informing the assessment of the wholesale LL markets? Please explain the reasons for your answer, clearly indicating the relevant paragraph numbers to which your comments refer, along with all relevant factual/empirical evidence supporting your views.

4. Retail Market Assessment

Overview

- 4.1 In this section, ComReg outlines some of the main structural and behavioural characteristics in the provision of retail LLs. ComReg is not obliged to conclude on a precise definition of any retail LL markets within this market review. Rather, the purpose of this section is to inform ComReg's subsequent definition and competition assessment of the WHQA market(s) in Sections 5 and 6 of this Consultation, including with respect to the strength of any indirect constraints from the retail LL market(s) on any such proposed wholesale markets¹⁶⁷.
- 4.2 In summary, having assessed the retail LL market(s), ComReg is of the preliminary view that there is likely to be three separate retail LL markets namely:
- (a) Low Bandwidth Traditional Interface ('**TI**') Retail Market consisting of all retail leased lines carried over analogue, digital and TDM interfaces with bandwidths of $\leq 2\text{Mb/s}$, with this market being national in its geographic scope (the '**Low Bandwidth ('LB') TI Retail Market**');
 - (b) High Bandwidth TI Retail Market which consists of all wholesale leased lines provided over a TDM interface with bandwidths $> 2\text{Mb/s}$, with this market being national in its geographic scope (the '**High Bandwidth ('HB') TI Retail Market**'); and a
 - (c) Modern Interface ('**MI**') Retail Market consisting of all retail leased lines carried over modern technology interfaces such as Ethernet, EFM, xWDM and other such high bandwidth interfaces, with this market being national in its geographic scope (the '**MI Retail Market**');
- 4.3 The above markets (together referred to as the '**Relevant Retail Markets**') do not distinguish between the different types of media (wireless P2P links, fibre, copper) used to provide retail LLs. i.e., it is transmission media neutral.
- 4.4 Asymmetric business broadband is not considered a substitute for a retail LL due to the likely lack of effective supply and demand side substitutability between the products. Although a certain cohort of end-users may consider business broadband a substitute, it is not sufficient to act a competitive constraint on the retail (or wholesale) LL markets.
- 4.5 Furthermore, passive infrastructure, such as Dark Fibre, is not considered to be an effective substitute for a retail LL due to the investment and expertise needed to provide retail LL using such passive infrastructure.

¹⁶⁷ Indirect constraint might arise in the provision of WHQA if (1) purchasers of WHQA pass on wholesale price increases to retail LL customers through retail price increases and (2) consumers were aware of, and responsive to these retail price changes and (3) a sufficient number of these customers were likely to switch to alternative modes of communication in response to retail price increases (not the retail arm of the WHQA provider). In which case, indirect constraints could act to constrain the wholesale price-setting behaviour of a Hypothetical Monopolist ('**HM**') supplier of WHQA services.

Introduction

- 4.6 This section considers the following issues:
- (a) Initial considerations of relevance to the likely scope of the retail market from a product perspective, including:
 - (i) whether Business Broadband and/or EFM are an effective substitutes for a retail LL (discussed in paragraphs 4.9 to 4.57);
 - (ii) whether retail LLs provided over a wireless P2P medium are considered an effective substitute for one provided over a wired medium (discussed in paragraphs 4.58 to 4.89); and
 - (iii) whether Dark Fibre is an effective substitute for a retail LL (discussed in paragraphs 4.90 to 4.97).
- 4.7 After assessing the above initial considerations ComReg:
- (a) assesses the likely scope of the retail LL product market(s) (paragraphs 4.98 to 4.208);
 - (b) assesses the likely scope of the retail LL geographic market(s) (discussed in paragraphs 4.209 to 4.238); and
 - (c) summarises its overall preliminary conclusions on the retail LL markets (discussed in paragraphs 4.239 to 4.242).
- 4.8 As part of the above assessment, ComReg has considered evidence from a number of sources as outlined in paragraph 1.44 above. ComReg has used this information to inform its retail analysis, rather than acting as a definitive source for the definition of a relevant retail LL market. In addition, given the absence of the availability of clear and precise data regarding elasticities of demand for retail LLs (the narrowest retail service driving demand for the focal at wholesale level) and potential substitutes, ComReg considers the Hypothetical Monopolist Test ('HMT')¹⁶⁸ in a general sense. It then uses this as an additional tool to help inform its consideration of relevant issues alongside other available qualitative and quantitative data.

¹⁶⁸ The hypothetical monopolist test ('HMT') involves observing the response to a small but significant non transitory increase in price ('SSNIP') in the price of the focal product. If a significant number of customers switch to an alternative product, making the price increase unprofitable, then the alternative product is also included in the relevant product market.

Initial considerations of relevance to the likely scope of the retail LL market(s)

Are Business Broadband and/or Ethernet First Mile ('EFM') services effective substitutes for a retail LL?

- 4.9 Broadband services are used by business customers for connections to the internet, e-mail, cloud storage and other data services. Broadband services are generally asymmetric (i.e. lower upload than download speeds) and contended services with speeds that are often lower than that found with retail LL services. Furthermore, the SLAs that are provided by SPs for Broadband are generally of a lower standard than for retail LL services.
- 4.10 In this section, ComReg presents information and evidence to support its preliminary view that Business Broadband products are not an effective substitute for retail LL services – for either MI or TI LLs.
- 4.11 In Ireland, retail broadband services to businesses are provided over various technologies and platforms:
- Copper based broadband ('**xDSL**');
 - Broadband provided over Fibre to the cabinet or home/building (referred to collectively as **FTTx**);
 - Broadband provided over a Cable modem;
 - Mobile broadband provided over a 3G/4G mobile network;
 - Fixed Wireless Access ('**FWA**') networks; and
 - Satellite.
- 4.12 Another potential substitute to retail LLs are EFM type services. EFM is a set of specifications that allow SPs to run Ethernet over multiple bonded copper pairs in the access segment to connect the "first mile" from the customer to the nearest node. In Ireland, SPs lease Eircom's copper local loops to connect customer premises to the nearest local serving exchange. From exchange locations connectivity can then be provided in a similar manner to LLs, using the SPs' backhaul and core transmission networks. EFM is currently supplied by BT, Magnet and Digiweb using Eircom's LLU products¹⁶⁹.
- 4.13 In Table 3 ComReg summarises product characteristics of broadband, EFM and LL services. The extent to which broadband or EFM services may represent an effective retail substitute for either retail TI LL or retail MI LL is considered in paragraphs 4.14 to 4.57 below.

¹⁶⁹ Eircom is obliged to provide unbundled local loops on regulated terms as a remedy for its SMP in the WPNIA (Wholesale Physical Network Infrastructure Access) market as per ComReg Decision D05/10.

Table 3: Overview of product characteristics of LL, broadband and EFM services

	Copper Network Broadband	FTTC Broadband	FTTH Broadband	Cable Broadband	Mobile Broadband	Satellite Broadband	Fixed Wireless Access BB	EFM	Leased Line
Geographic availability	Widely available	Widely Available	Limited Availability	Widely Available	Widely Available	Widely Available	Widely Available	Widely Available	Widely available
Download Speeds	Up to 24Mbps	Up to 100 Mb/s	Up to 1000Mbps	Up to 360Mbps	Up to 75Mbps	Up to 20Mbps	Up to 20Mbps	Up to 20Mbps	64kbps up to 100Gbps + symmetric capacity available
Upload Speeds	Up to 2Mbps	Up to 25 Mb/s	Up to 100Mbps	Up to 20Mbps	Up to 60 Mb/s	Up to 2 Mb/s	Up to 5 Mb/s	Up to 20Mbps	
Service availability	Business specific SLA's standards not typically available.							Business-grade service availability standards available.	
Contention	The amount of contention can be varied by provision of backhaul capacity depending on end-user requirements. Uncontended service cannot be 100% guaranteed for the "up to" speed provided.							Uncontended	Uncontended
Latency/Jitter	Variable - dependent on the bandwidth capacity of the network and traffic at any given point in time, specified levels cannot be guaranteed							Low	Low
Resilience	Not deployed to support resilience options							Local access resilience available	Route, local access + call resilience available
Synchronisation	Not supported		Supported	Not supported					Supported
Typical Price Range for Businesses (incl. VAT)	€17.80 - €133.50	€29 - €60	€55 - €90	€80 - €90	€20 - €70	€72 - €395	€43 - €188)	Not publicly available. Typically sold on price-on-application basis.	Prices start from €120. Typically sold on price-on-application basis.

Demand Side Substitution

Product Characteristics of Broadband

- 4.14 As highlighted in Table 3 above, NGA broadband¹⁷⁰ services running a download speed of up to 1Gbs and an upload bandwidth of up to 100 Mb/s could potentially be considered as broadly similar in bandwidth terms to some symmetric LL services. However, broadband services typically do not offer bandwidth guarantee with service speeds provided on an up-to basis and are typically below this headline speed.
- 4.15 The 2014 Market Research indicated that the average download speed cited by surveyed business broadband purchasers were aware that their service download speed was 36 Mb/s. This compared to 96 Mb/s average download speed by purchasers of LLs for their service¹⁷¹. Similarly, the average upload speed cited by surveyed business broadband purchasers (that were aware of their service upload speed) was 12 Mb/s compared to 92 Mb/s average upload speed by purchasers of LL services¹⁷².
- 4.16 This suggests that bandwidth provided by broadband services is sufficiently different to the identified bandwidth requirements of the majority of businesses currently purchasing retail LLs. Furthermore, the average bandwidths being cited by LL purchasers are almost symmetrical.
- 4.17 Moreover, there are also a number of differences of other service features of Business Broadband compared to LLs. These include differences in terms of contention, latency and jitter, the level of security, resilience options, SLAs and synchronisation support. Where these features are valued by potential customers, it is unlikely that broadband service will be a close substitute to a LL. For TI LLs and some lower bandwidth MI LLs, NGA and cable broadband may be comparable in terms of speed to retail LL but specific quality issues may be important for a sizeable portion of customers.
- 4.18 For example, Eircom's standard regulated wholesale LL service offers 99.95% service availability or 4 hours of service downtime per year. This compares to 99.5% or up to 1.8 days annual service downtime for its regulated standard wholesale FTTC broadband service¹⁷³. This is a material difference for businesses who consider connectivity as a critical input for their day to day operations.
- 4.19 Also, from inspecting the different products descriptions, other SPs were not offering higher specification SLA's for their broadband products, including those provided over LLU or their own network inputs.

¹⁷⁰ FTTC, FTTH and cable broadband.

¹⁷¹ The 2014 Market Research, Slides 40 and 97.

¹⁷² The 2014 Market Research, Slides 42 and 99.

¹⁷³ Eircom is obliged not to discriminate between its wholesale offering to other SPs and that which it provides to its own retail arm.

- 4.20 As part of ComReg's 2014 Market Research, respondents purchasing broadband and LL services were asked to rank product characteristics of these services in terms of their importance when selecting a SP¹⁷⁴. Table 4 below illustrates that the top three attributes (considered as 'very important') for LL users are service availability, resilience and contention; while for broadband users the top three attributes are service availability, download speed and upload speed.
- 4.21 This suggests that purchasers of LLs are likely to place a higher value on service quality aspects that are important for multi-site connectivity, VoIP and data services uses compared to purchasers of broadband services. Thus, it is likely that LL users would not consider broadband services as an effective alternative, because these services have inferior service quality characteristics compared to LLs.

Table 4: Product characteristics considered as 'very important' when selecting service provider

	Broadband (%)	Ranking	Leased lines (%)	Ranking
Availability	73%	1	82%	1
Resilience	51%	4	61%	2
Contention	39%	5	53%	3
Download speed	59%	2	53%	3
Upload speed	54%	3	47%	4
Latency	39%	5	46%	5
Jitter	38%	6	44%	6
Symmetry	39%	5	37%	7

- 4.22 The 2014 Market Research also indicated that LL purchasers are more likely to have high quality SLAs when compared to broadband purchasers. For example, 40% of broadband purchasers surveyed indicated that they definitely had a SLA, with 17% of those having a bespoke SLA¹⁷⁵. In comparison, 83% of LL purchasers surveyed had an SLA, with 38% of those having a bespoke SLA¹⁷⁶.

¹⁷⁴ The 2014 Market Research, Slides 33 and 87.

¹⁷⁵ The 2014 Market Research, Slides 35 and 36.

¹⁷⁶ The 2014 Market Research, Slides 92 and 93.

- 4.23 Substantial differences between broadband and LL services also exist in terms of SLA content. For example, 78% of retail LL customers had a specifically required target date for delivery of a new service (compared with 49% for broadband customers) and 43% of retail LL customers had compensation mechanisms for breaches of the agreement compared to 19% for broadband customers¹⁷⁷.
- 4.24 Thus, it is ComReg's preliminary view that while NGA broadband could potentially be regarded as broadly similar in terms of bandwidth to a lower bandwidth symmetric LL service, there are discernible differences in other product characteristics such as service availability, the quality of SLA's contention, resilience and symmetrical bandwidth that will remain over the period of this market review. As such, NGA broadband is not likely to be considered a close substitute to retail LLs whether provided on an MI or TI platform.

Product Characteristics of EFM

- 4.25 EFM, on the other hand, exhibits characteristics that are similar to characteristics of LL services as highlighted in Table 3 above and thus, can be considered by consumers as a close substitute to lower bandwidth MI LLs.
- 4.26 Firstly, both EFM and Ethernet LLs have an Ethernet interface which further increasing similarity between these two services. Symmetrical upload and download speeds, low or absent contention along with good quality resilience and low jitter are all supported by the EFM platform. Moreover, higher quality SLA's than those typically available from a Business Broadband perspective are also available for EFM based products. While, synchronisation is generally not supported by EFM, it is technically feasible to support this aspect of the service over EFM too.¹⁷⁸

Pricing of Business Broadband and EFM

- 4.27 The marketing of business broadband and EFM packages helps provide an understanding of how SPs position broadband services relative to LLs and hence, whether they may be targeting different markets/customer segments when offering broadband and LL services.

¹⁷⁷ The 2014 Market Research, Slides 37 and 94.

¹⁷⁸ See http://www.btirelandwholesale.com/whole_prodserve_efm.shtml for details.

4.28 In this regard, ComReg notes that SPs do not usually market business broadband as an alternative to a retail LL. A common marketing approach for SPs providing both broadband and LLs¹⁷⁹ is to match the typical end-user types to these services. Businesses are often distinguished by the number of employees with varied ranges of requirements so different data services are offered to these businesses¹⁸⁰. In general, smaller firms with less business critical services or multi-site home-worker connectivity are offered asymmetric broadband whereas larger businesses running business-critical services are offered more expensive LLs. Thus, SPs' marketing suggests that broadband and LL services are aimed at separate groups of end-users who demand different service characteristics.

4.29 In contrast, the way EFM is marketed suggests that it is likely to be seen as a lower cost LL service. For instance, BT notes that:

*"BT Ireland Wholesale offers EFM access (Ethernet in the First Mile), known as BT EFM Etherways, as an extremely affordable access option for your network."*¹⁸¹.

4.30 BT also notes that:

*"A key advantage is that with EFM, you can now aggregate multiple ethernet-based services with a single access connection at sites that previously could only be reached via legacy access technologies."*¹⁸²

and differentiates the service only in terms of access platform utilised for service delivery;

*"EFM gives you symmetric and reliable high-speed access but unlike our fibre Etherways, EFM uses existing copper lines to connect you via our existing BT footprint to our backbone Ethernet core"*¹⁸³.

4.31 Thus, EFM LL marketing seems to suggest that this service is positioned as a substitute for a retail LL service.

¹⁷⁹ Such SPs include Eircom, BT Ireland, Virgin Media, Vodafone, Magnet and other SPs.

¹⁸⁰ See <https://business.eir.ie/>, <https://www.virginmedia.ie/business/>, <http://www.vodafone.ie/> and <http://www.magnet.ie/business/>. Information from these websites retrieved on 5 April 2016.

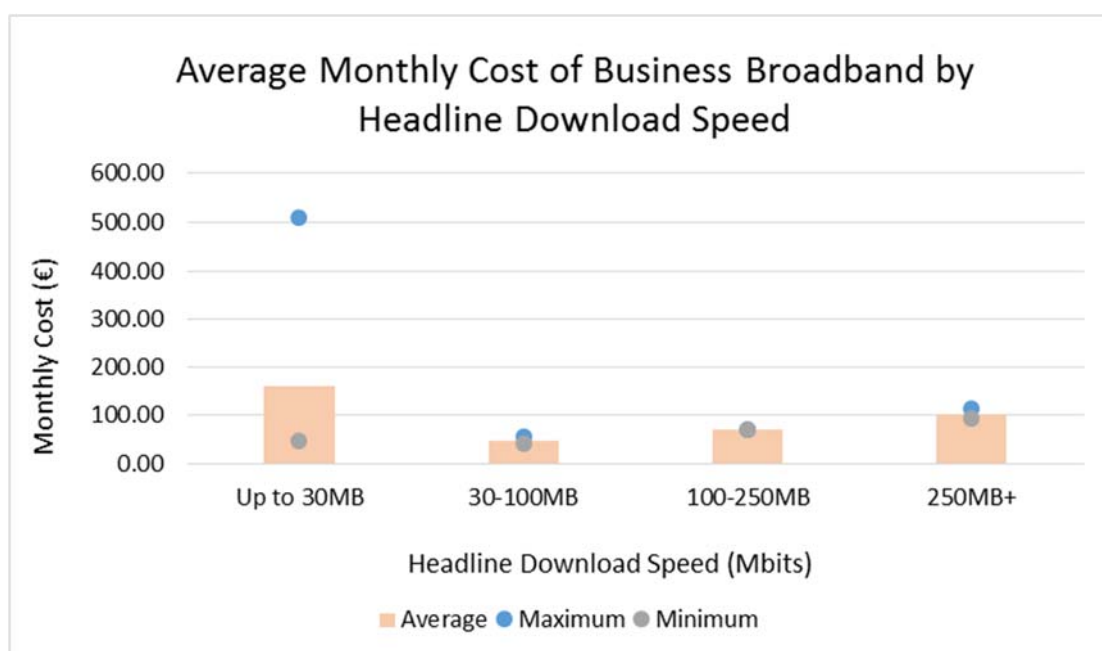
¹⁸¹ See http://www.btirelandwholesale.com/whole_prodserve_efm.shtml. Information from this website retrieved on 5 April 2016. Other SP providing retail EFM services market the product in the same way.

¹⁸² *Ibid.*

¹⁸³ *Ibid.*

- 4.32 In addition to looking at SPs' marketing of broadband, EFM and LL products, ComReg also researched publicly available retail prices of these services. ComReg analysed broadband tariffs offered by five SPs and identified 28 tariff plans or bundles that included a broadband service aimed at business broadband users. The 28 examined tariffs offered speeds ranging from 3Mb/s to 1,000Mb/s, with most offering an unlimited download allowance. Figure 12 below shows the average monthly cost for these 28 tariffs categorised by advertised download speed, using the methodology outlined in Appendix: 12. Figure 12 also shows the range of the monthly costs for business broadband tariffs, for each headline speed.

Figure 12: Average Monthly Cost of Business Broadband by Headline Download Speed



Source: ComReg calculations based on tariff data from SPs' websites accessed in June 2016.

- 4.33 In general, it can be observed that broadband services with higher speeds are associated with higher prices for a given SP. However, for each broadband speed, there is an overlap with the price range associated with other similar headline download speeds. For example the monthly cost of broadband offered at speed 'up to 24Mb/s falls within the range of the average cost of broadband offered at speeds 24-100Mb/s and 100-250Mb/s. ComReg notes that typically, the monthly average price of asymmetric broadband rarely exceeds €100. In contrast, the entry-level low bandwidth LL services are priced at €120¹⁸⁴ thus, suggesting limited overlap between prices of broadband and LL services.

¹⁸⁴ 25Mb/s symmetrical over a wireless medium. See <http://www.hostireland.com/our-products/>. Information from this website retrieved on 5 April 2016.

- 4.34 The 2014 Market Research also indicates that respondents identified substantial differences between costs of broadband and LL services. For example, the average monthly cost of stand-alone broadband service cited by surveyed business broadband purchasers that were aware of their service cost was €235 compared to the €1,129 average monthly cost of stand-alone LL service cited by purchasers of retail LL services.¹⁸⁵
- 4.35 In relation to EFM services, there is no publicly available retail pricing information. However, ComReg is aware that pricing of EFM is consistent with SPs' marketing which positions EFM as an alternative to a retail LL service thus, suggesting that there is potentially more of an overlap between prices of EFM and low bandwidth LL services, than with prices of business broadband services.

Intended Use of Broadband and EFM

- 4.36 As part of the 2014 Market Research respondents were asked to indicate what they are using their broadband and/or LL services for. Table 5 indicates that broadband and LLs appear to be used for different applications by consumers. In particular, broadband is mostly used for email and internet access with 97% of respondents purchasing broadband using their service for this purpose¹⁸⁶. Retail LLs, on the contrary, are often used for multiple purposes, including email and Internet, data services, connectivity between premises and VoIP services¹⁸⁷.

Table 5: Use of primary data connectivity service

	Broadband (%)	Ranking	Leased lines (%)	Ranking
Email & internet	97%	1	85%	1
Connectivity between premises	19%	3	53%	2
Employee remote access	18%	4	49%	3
Data services	25%	2	47%	4
Voice - VoIP	9%	6	41%	5
Disaster recovery services	11%	5	34%	6

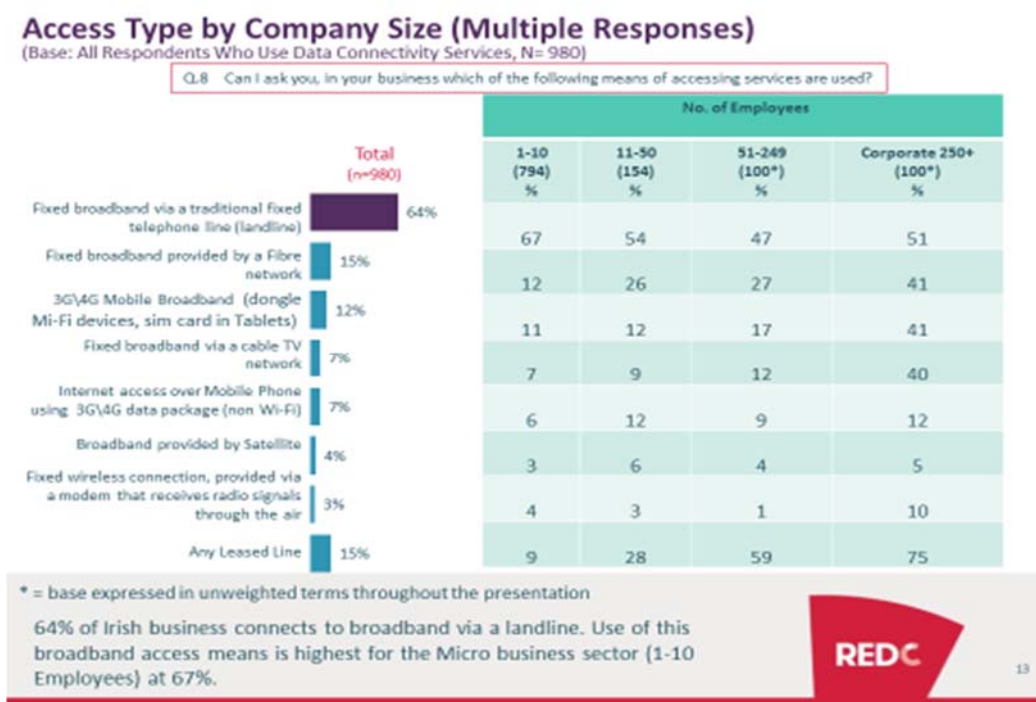
¹⁸⁵ The 2014 Market Research, Slide 22. The prices in Figure 12 are lowest prices available whereas these figures are average cost of broadband service cited by 2014 Market Research respondents.

¹⁸⁶ The 2014 Market Research, Slide 28.

¹⁸⁷ The 2014 Market Research, Slide 85.

4.37 The profile of businesses purchasing broadband and LLs also indicates that these services are used for different purposes. Figure 13 below indicates that the tendency to purchase LLs increases with the size of the business. For example, 67% of surveyed micro businesses (businesses with 1 to 10 employees) purchase broadband via a landline, but only 9% purchase LLs¹⁸⁸. In contrast, 51% of large businesses (businesses with over 250 employees) purchase broadband via landline and 75% purchase LLs¹⁸⁹.

Figure 13: Access Type by Company Size



4.38 As such, it can be seen that there is a distinct demand for LL and business broadband services.

Substitution

4.39 As noted in paragraphs 3.52 to 3.54 above, there has been an increased rollout of NGA broadband networks since the 2008 Decision. For example, Eircom has rolled out its NGA FTTC/H network to 1.4 million premises (with a final target of 1.9 million) and currently has 392,868¹⁹⁰ active retail and wholesale VDSL lines.

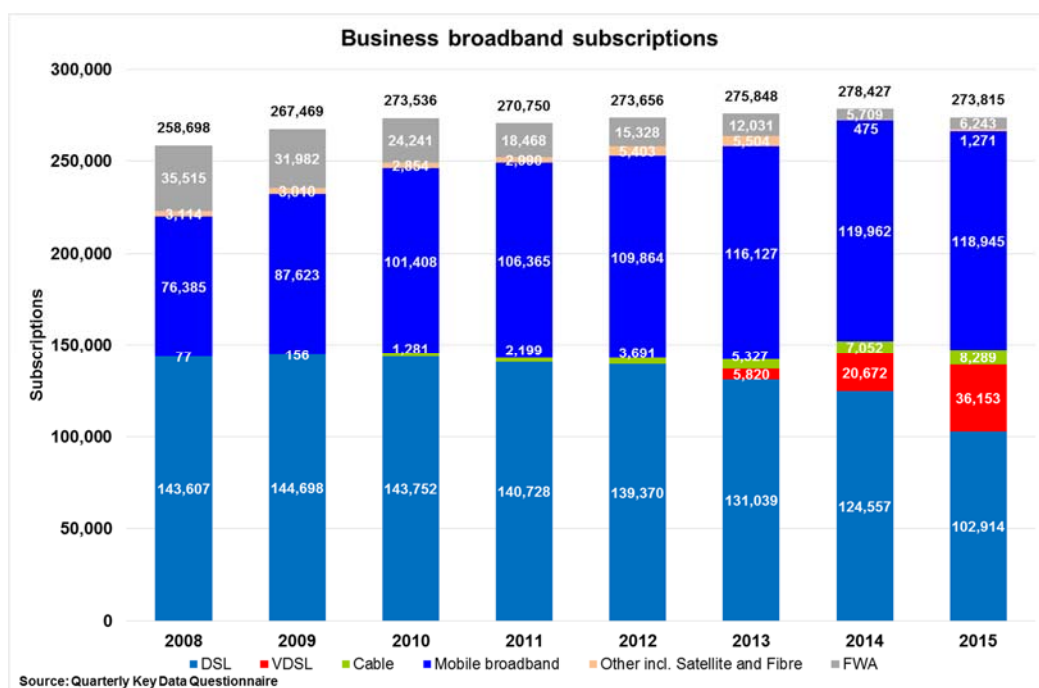
¹⁸⁸ The 2014 Market Research, Slide 13.

¹⁸⁹ The 2014 Market Research, Slide 13.

¹⁹⁰ See ComReg Quarterly Key Data Report, Q1 2016.

4.40 Eircom’s NGA network allows for the provision of broadband services at download speeds that are comparable to lower bandwidth retail LLs. However, the take-up of such services is relatively low. Figure 14 below indicates that at the end of 2015, 81% of businesses purchasing broadband services were purchasing either DSL or mobile broadband services. The number of FTTC, FTTH and Cable broadband subscriptions - while gradually increasing - accounted for only 17% of all business broadband subscriptions.

Figure 14: Business broadband subscriptions



4.41 The 2014 Market research also indicated that only a small proportion of respondents purchased NGA broadband with 15% of respondents noting that they use fixed broadband provided by fibre network and 7% noting that they use fixed broadband provided via a cable TV network¹⁹¹.

4.42 Hence, the rollout of NGA networks have so far resulted in modest growth in the take up of higher bandwidth broadband services and had limited impact on the take up of LL services. As noted, in paragraph 3.44 above, data usage by end-users increased the demand for higher bandwidth LL services instead of broadband services. ComReg notes however, that the ability to switch to a broadband product provided over a FTTC, FTTH or cable network depends on the geographic availability of such network. As the rollout of NGA networks advances, ComReg is of the preliminary view that more businesses will have the option to switch to higher bandwidth broadband services.

4.43 It is also important to note that LL purchasers considering to migrate to broadband services would face similar switching barriers that exist when switching between LL with different interfaces. As highlighted in paragraph 4.160 below, such costs include:

¹⁹¹ The 2014 Market Research, Slide 13.

- changes required to customer premises equipment;
 - the potential for service disruption; and
 - parallel operation whilst the new service is tested.
- 4.44 The impact of switching costs will vary by type of LL purchaser. For businesses purchasing numerous LL circuits or using specialised applications that require low latency/jitter and/or uncontended service the switching costs to Business Broadband are likely to be substantial.
- 4.45 The 2014 Market Research also indicated limited migration from LL to broadband services. For example, only 8% of respondents purchasing broadband services noted that they were previously using LL services with the majority of respondents who switched their SP in the past noting that they were using broadband services¹⁹².
- 4.46 In addition, as part of the 2014 Market Research, respondents purchasing LLs were asked to indicate their likely behaviour in response to a SSNIP in their LL service. Among respondents purchasing LL in a bundle with other services, 65% noted that they would potentially change their behaviour with 11% of these respondents noting that they would cancel their existing LL service and switch to broadband provider¹⁹³. Among respondents purchasing LL as a stand-alone service, 37% noted that they would potentially change their behaviour with 7% of these respondents noting that they would cancel their existing service and switch to broadband provider¹⁹⁴.
- 4.47 This evidence would suggest that a HM of LL services is likely to be able to sustain a profitable SSNIP in the range of 5-10% above the competitive level without a substantial number of customers switching to broadband services.

Supply-Side Substitution

- 4.48 ComReg notes that supply side substitution appears technically possible, in that a LLU operator which is not currently providing EFM-based Ethernet services (which, as noted in paragraphs 4.25 to 4.26 above, EFM exhibits characteristics that are similar to characteristics of LL services) could begin to do so relatively quickly and easily. However, supply side substitution could potentially broaden the relevant markets only in instances where the constraint arising from the supply side substitution provides an additional constraint that was not already considered as part of demand side substitution analysis i.e.; SPs that are already providing services considered to be part of the relevant markets cannot provide an additional supply side substitution constraint.

¹⁹² The 2014 Market Research, Slide 67.

¹⁹³ The 2014 Market Research, Slides 124 and 125.

¹⁹⁴ The 2014 Market Research, Slides 129 and 130.

- 4.49 In this regard, ComReg notes that three largest purchasers of LLU products are BT, Digiweb and Magnet. The supply-side substitution from these operators would not be relevant as these operators supply both retail LL and EFM services. Therefore, any competitive constraint arising from these operators' presence in the provision of LL services is already taken into account. The remaining LLU operators (3PlayPlus and Colt) have negligible presence¹⁹⁵ at Eircom's exchanges and thus, are unlikely to provide a services of a sufficient scale to provide a competitive constraint.
- 4.50 As such, only those SPs that are currently involved in the supply of retail LLs are also in a position to provide EFM based services.

SP views on substitutability between LL and broadband services

- 4.51 As part of the assessment on the substitutability between LL and broadband services, ComReg sought the views of SPs currently supplying LL services in Ireland as to whether broadband services are effective substitutes for retail LL¹⁹⁶. Of the 12 respondents, 4 considered the two services to be effective substitutes, five considered them to be ineffective substitutes, and four were of the opinion that in some limited circumstances, they could be considered as effective substitutes.¹⁹⁷
- 4.52 In general, respondents that viewed LL and broadband as substitutable services noted that increased bandwidth of broadband made this service more attractive to businesses that do not have requirements for very high bandwidth and business class SLAs.
- 4.53 Respondents that did not consider LL and broadband as substitutes at the retail level also noted the existing differences in product characteristics such as contention and service availability as well as differences in SLAs. In their view, end-users requiring product characteristics exhibited by LL would not consider broadband as an effective alternative.

Preliminary Conclusions on whether Broadband and EFM services are effective substitutes for retail LLs

- 4.54 Having considered relevant demand side factors including functionality, pricing and consumer usage, as well as relevant supply side factors, ComReg's preliminary view is that broadband services are not likely to be a sufficiently effective substitute for either a retail TI LL or a retail MI LL. Broadband is therefore excluded from any potential retail LL market.

¹⁹⁵ 3PlayPlus had an LLU presence at 3x█ while Colt had presence at 3x█ Eircom exchanges as of Q4 2015.

¹⁹⁶ Q 8b ComReg Qualitative Questionnaire; June 2015.

¹⁹⁷ Responses to Qualitative Questionnaire, June 2015.

- 4.55 ComReg acknowledges that for many SMEs the parameters of service offered by broadband services are likely to be sufficient to meet their business requirements and that bandwidths supported by NGA broadband can match and exceed the bandwidths of lower bandwidth LLs. However, there remains a substantial difference in product characteristics that appears to be important to purchasers of LL such as symmetrical up/down speed, high quality LLs, service availability, resilience and low latency/jitter. These characteristics are not sufficiently important to business broadband users to warrant switching to a retail LL in the event of a relative price increase in business broadband services.
- 4.56 Price comparisons indicate that in general there continues to exist differences in the relative prices of broadband and retail LL services, with retail LLs being considerably more expensive than Business Broadband. However, even in light of a narrowing gap of the download speeds of Business Broadband relative to lower speed retail LLs there has not been a significantly increased uptake of broadband. While the 2014 Market Research indicated that a minority of users might consider switching to broadband in response to a SSNIP, it is not of a sufficient scale to conclude that Business Broadband is an effective substitute for retail LLs.
- 4.57 EFM, as noted in paragraphs 4.25 and 4.26 above, exhibits characteristics that are similar to the characteristics of retail LL services and from the end-user perspective has the same interface as an Ethernet based LL. Pricing and marketing evidence would suggest that EFM is likely to be considered an effective substitute for lower priced retail MI LL services, especially for end-users that do not require high bandwidths. ComReg is therefore of the preliminary view that EFM is likely to be in the same retail market as Ethernet LLs¹⁹⁸.

Are LLs provided over P2P wireless media an effective substitute for wired LLs?

Introduction

- 4.58 Point-to-point ('P2P') radio links are used mainly by fixed and mobile operators, broadcasters and utilities to provide transmission capacity and networks¹⁹⁹ as well as provide redundancy and back up for other networks.
- 4.59 Compared to many other European countries, radio links are more extensively used in Ireland and since 2009 there has been a 25% increase in the number of point-to-point radio links licences issued by ComReg as indicated by Figure 8.

¹⁹⁸ ComReg notes that the inclusion, or otherwise, of EFM services in the retail MI LL market is not likely to impact upon ComReg's assessment of competition in the WHQA market given the relatively low uptake of EFM in Ireland.

¹⁹⁹ In providing transmission capacity, radio rather than cable is often the preferred solution where constraints such as costs, local topography and the need for access to remote rural locations are fundamental considerations. In such scenarios, radio links provide operators with the ability to roll-out rapidly and the capability to install transmission paths as and when required.

- 4.60 As noted in paragraphs 3.18 and 3.19 above, there has been an increase in the utilisation of P2P radio links to supply retail LLs. Airspeed Telecom and Digiweb supply these services on a nationwide basis. Furthermore, Host Ireland²⁰⁰ offers P2P radio links based retail LLs. ComReg notes that ESBT offers P2P radio links from its network of towers to provide wholesale LLs.²⁰¹ Other operators such as Eircom, BT, UPC and Vodafone use P2P radio links to serve some of their customers.²⁰²
- 4.61 As illustrated in Figure 8 above, the number of retail LLs being provided over P2P radio links is increasing year on year and now account for 17.3% of all retail LLs.
- 4.62 Below, ComReg provides data and evidence to support its preliminary view that P2P radio links are an effective substitute for wired medium based retail LLs. In doing so, ComReg assesses demand-side and supply-side considerations.
- 4.63 This section is set out as follows:
- (a) The product characteristics of P2P radio links are described in paragraphs 4.64 to 4.74;
 - (b) The pricing of such products is then looked at in paragraphs 4.75 to 4.78;
 - (c) We then discuss their intended use in paragraphs 4.79 and 4.80;
 - (d) SPs views on the substitutability of P2P radio links with wired retail LLs is examined in paragraphs 4.80 to 4.88; and
 - (e) We then conclude in paragraph 4.89.

Product Characteristics

- 4.64 P2P radio links must be licenced by ComReg to gain access to the radio spectrum. In Ireland there is spectrum available in 20 different frequency bands²⁰³, from 1.3 GHz to 80 GHz, for the deployment of P2P radio links by operators.²⁰⁴

²⁰⁰ See <http://www.hostireland.com/> for details.

²⁰¹ See <https://esb.ie/docs/default-source/telecoms/esb-telecoms-ltd-licenced-microwave-radioebf7592d46d164eb900aff0000c22e36.pdf?sfvrsn=2> for details.

²⁰² [REDACTED] have stated that they use wireless technology where fibre is not practicable; Response to Qualitative Questionnaire; July 2015.

²⁰³ See ComReg Document 09/89R1 for more details on the spectrum bands available for fixed link operation.

²⁰⁴ The regulations governing the issue of Point to Point Radio Link licences are The Wireless Telegraphy (Radio Link licence) Regulations, 2009 (S.I. no. 370 of 2009).

- 4.65 One of the issues with P2P radio links in other countries is the fact that congestion can limit the availability of P2P wireless links in densely populated areas. This arises from the fact that the same frequency (with the same polarisation) cannot be used by two links in the same geographic area due to spectrum interference problems. As such, this may limit the competitive constraint that P2P wireless links can place on wired retail LLs. Another is geographic distance. With large geographies multi-hop links would be required to connect distant locations due to the distance limitations of P2P microwave radio compared to that which can be easily achieved with fibre optic cable transmission systems.
- 4.66 In relation to congestion, in April 2014, ComReg closed the 13 GHz and 15 GHz spectrum bands to new radio link applications in the congestion area covering certain parts of Greater Dublin because of the exhaustion of all available channels within the congested area.²⁰⁵ However, demand for new radio links appears to have shifted towards higher frequency bands in this area. For example, ComReg notes that radio links using 18 GHz and 23 GHz bands in the congestion area increased from 97 in 2013 to 147 in 2015. This may be due to an exhaustion of the existing channels in the lower frequency bands or the ability for the higher frequency bands to meet the users' demands²⁰⁶.
- 4.67 Outside of this small, albeit relatively densely populated area, there are no issues surrounding congestion in Ireland. The number of P2P radio links do not appear to be weighted towards a particular geographic area such as rural areas. As of January 2016 circa 29% of all radio link licences concern links in the Greater Dublin region, while circa 6% of all links are in the Cork region, and circa 4% in the Limerick and Galway regions.²⁰⁷
- 4.68 Furthermore, it should be noted that in the context of Ireland, there are a number of environmental and demographic factors that ameliorate the issue of spectrum scarcity and congestion. These include the topography and small geographic extent of the State, and the relatively low density of the population. For instance, with access to only 3 wireless high-sites (Mount Oriel in Louth, Three Rock Mountain in Dublin and Mount Leinster in Carlow) a SP could provide coverage to a the majority of premises in the Leinster region.
- 4.69 Public undertakings such as State bodies, courts, hospitals, and schools are large purchasers of P2P radio link based retail LLs. It is noteworthy to consider the experience of one of the largest purchasers of retail LLs in the State – HEAnet.²⁰⁸

²⁰⁵ See Information notice 14/32. <http://www.comreg.ie/fileupload/publications/ComReg1432.pdf>.

²⁰⁶ For example, the radio link licences offered in the 38 GHz band are available on a wideband basis (56 and 112 MHz bandwidths) whereas the lower frequency bands are available only on narrow/medium bandwidth basis (3.5 and 7 MHz).

²⁰⁷ ComReg analysis of P2P radio link locations.

²⁰⁸ See Oxera Report, Box 5.2.

- 4.70 HEAnet manages the ICT needs of the Irish public education sector including primary, secondary and 3rd level institutions connectivity requirements.²⁰⁹ In relation to secondary schools, HEAnet organises a tender for the delivery of 100Mb/s symmetric connections for 788 schools.²¹⁰ Between 2009 and 2013 HEAnet awarded tenders for this service to the following six successful bidders; ☒ [REDACTED], ☒ [REDACTED], ☒ [REDACTED], ☒ [REDACTED], ☒ [REDACTED] and ☒ [REDACTED].²¹¹
- 4.71 Although HEAnet places a ☒ [REDACTED] premium on bids from wired operators²¹², successful bids from SPs utilising P2P radio links were awarded approximately 2/3rds of the contracts. HEAnet also stated that no tender for any school failed due to Line of Sight ('LoS')²¹³ issues.²¹⁴ The bids, after a ☒ [REDACTED] premium being placed on wired solutions, was based on lowest price.
- 4.72 Furthermore, there were no discernible geographic differences between urban and rural areas in terms of the success of wireless bids vis-à-vis wired bids.²¹⁵
- 4.73 HEAnet is now in the process of retendering the contracts and as a result of there being no issues with the performance of P2P radio links, the premium on wired solutions has not changed.²¹⁶
- 4.74 The shorter lead-time for delivery of P2P wireless than those for fibre based LLs was also cited by some end-users and SPs as being a significant advantage. This applied particularly when civil engineering work was required to achieve fibre access. Issues with Public Authority wayleaves, private landlords' permissions and the time required to complete new trenching and cabling can result in extended delivery times for fibre. In contrast, the installation of P2P dishes and associated equipment can often be completed in a shorter timescale.

²⁰⁹ See <http://www.heanet.ie/schools> for more details.

²¹⁰ The specification for the contracts were similar to those of other end-users of retail LLs including high quality SLA's and penalties for non-performance in relation to provisioning and service assurance.

²¹¹ SPs were allowed to bid for groups of schools in order to exploit economies of scale and density in the tender process.

²¹² HEAnet states that wired solutions are preferred as ownership of the infrastructure used to provide the service remains with the school at the end of the contract. This is not the case for wireless provision.

²¹³ Line of Sight ('LoS') –where there is clear uninterrupted airspace between each end of a wireless link.

²¹⁴ E-mail from ☒ [REDACTED] 13 March 2016.

²¹⁵ Meeting between ComReg and HEAnet 9 Feb 2016.

²¹⁶ Meeting between ComReg and HEAnet 9 Feb 2016.

Pricing

- 4.75 As is the case with wired based retail LLs²¹⁷, retail pricing is difficult to discern due to the fact that in many cases, retail prices are based on PoA and the actual price of the connection is based on a number of factors such as access costs²¹⁸ but also the fact that the services provided over the access are the most relevant factors for pricing of services.²¹⁹
- 4.76 However, in ComReg's view pricing of P2P radio based retail LLs appears to be similar to wired LLs. As noted in paragraph 4.71, even though HEAnet placed a €[REDACTED] premium on wired solutions, P2P radio links were the medium that were successful in 2/3rds of the bids. As such, it meant that these bids had to be competitive vis-à-vis wired bids in order to win such contracts.
- 4.77 HEAnet further stated that the average installation charge for the tenders awarded between 2009 and 2013 was €[REDACTED] and the rental was €[REDACTED], the latest tenders for the contract renewal are €[REDACTED] and €[REDACTED].²²⁰
- 4.78 The relative success of P2P radio link based retail LLs over the period from 2013-2015 alongside the success of the technology in winning many of the HEAnet contracts and other major public service contracts indicates that P2P radio links are likely to be considered a substitute for retail LLs provided over wired media.

Intended Use

- 4.79 As P2P radio link based retail LLs are used to provide uncontended, symmetric, high quality access similar to wired based retail LLs there is no discernible difference in their intended use at a retail level.
- 4.80 However, ComReg acknowledges the fact that some end-users have a preference for wired solutions or use P2P radio links for resilience and redundancy purposes.²²¹ Furthermore as discussed in Section 5²²² below, the stated preference for MNOs is to use self-supply P2P wireless links rather than purchase third party LLs where dark fibre is not available or feasible.

²¹⁷ See paragraphs 4.114 to 4.115 for more details.

²¹⁸ In the case of P2P Wireless Links it is the cost of high sites, spectrum licenses, etc.

²¹⁹ See paragraph 3.47 to 3.49 above.

²²⁰ Meeting between ComReg and HEAnet 9 Feb 2016.

²²¹ See paragraph 4.87 below for more details.

²²² See paragraph 5.59.

SPs’ views on substitutability between wireless and wired LL

4.81 ComReg sought the views of SPs as part of the 2015 Qualitative Questionnaire. In particular, ComReg asked if SPs considered P2P radio links to be an effective substitute for wired retail LLs.²²³ A summary of their views is shown in Table 6 below.

Table 6: SPs’ views on wireless LLs [REDACTED]

Do you consider wireless retail LLs to be an effective substitute for wired retail LLs?		
Yes	Somewhat	No
✂ [REDACTED]	✂ [REDACTED]	✂ [REDACTED]
✂ [REDACTED] (up to 300Mbps)		✂ [REDACTED]
✂ [REDACTED]		✂ [REDACTED]
✂ [REDACTED]		✂ [REDACTED]
✂ [REDACTED]		✂ [REDACTED]

4.82 Table 6 illustrates that SPs who responded to this question were fairly even split in their assessment of these LL types with 5 SPs considering them to be substitutable, and 5 of the opinion that they are not substitutable. Furthermore, ✂ [REDACTED] position is that it can be substitutable only in circumstances where LoS is not an issue.

4.83 Looking at the responses in a little more depth Eircom stated that:

✂ [REDACTED]

✂ [REDACTED]

4.84 BT on the other hand stated that

✂ [REDACTED]

4.85 Hence, there are differing views as to the role of wireless technologies in providing LLs.

²²³ Q8 (a) Qualitative Questionnaire.

- 4.86 Of the other respondents, only Magnet and Enet answered substantively. Magnet stated that [REDACTED]. On the other hand, Enet's view is that [REDACTED].
- 4.87 The use of P2P radio links for redundancy and resilience purposes indicates that for some SPs, P2P radio links are a complement, rather than a substitute for wired retail LLs.
- 4.88 In summary, SPs that responded to the Qualitative Questionnaire were divided in their opinion as to whether P2P wireless links are capable of providing retail LL services.

Preliminary Conclusions on retail wireless P2P LL services

- 4.89 ComReg is of the preliminary view that retail LLs based on P2P wireless links are likely to be an effective substitute for LLs provided over a wired medium. This is due to the fact that;
- with the exception of very high bandwidths (>300Mb/s) P2P radio links offer a comparable service, in term of bandwidth, symmetry, SLAs, etc. to wired retail LLs;
 - P2P based radio links are gaining an increasing share of the retail LLs market;
 - Apart from a small area of Dublin and only for certain bands within this area, there are no spectrum scarcity and/or congestion issues that will effectively impede P2P radio links from meeting demand for retail LLs over the period of this review; and
 - Although some SPs have raised issues with the substitutability of wireless and wired LLs due to LoS and bandwidth limitations, the opinions of SPs are divided and the retail market evidence suggests that they are substitutable.

Is dark fibre an effective substitute for a retail LL?

- 4.90 ComReg now considers whether dark fibre is likely to be an effective substitute for a retail LL. Dark fibre refers to rental of fibre optic cables (or pairs of fibre within a cable) owned by a network operator. This is a passive, physical infrastructure product that requires the end-user to provide the electronic equipment (switches, multiplexers, repeaters etc.) necessary to transmit data over the fibre cable. In contrast, LL are considered to be 'active' products since they are provided to end-users with the electronics and management to enable an end-to-end connection between locations. Below, ComReg considers the extent to which dark fibre services may represent an effective retail substitute for retail LL.

Demand Side Substitution

Product Characteristics and intended use

- 4.91 ComReg notes that dark fibre is available at both the retail and wholesale level in Ireland. There are several providers supplying these services in Ireland²²⁴. Dark fibre, by its nature, has the ability to provide LLs - whether retail or wholesale - of any bandwidth and interface. However, to enable these LL connections, end-users need to provide additional inputs, such as terminal equipment and switching locations.
- 4.93 ComReg also notes that dark fibre requires additional operational resources, in commissioning, acceptance testing, and administering a physical infrastructure. As the service is generally provided as unmanaged (i.e. supplier of dark fibre services is not responsible for fault repairs and other maintenance services for any connected active equipment), the end-user must also place additional resources into monitoring and fault reporting of the link.
- 4.94 Thus, substantial additional costs as well as operational skills are required for retail end-users for managing their own networks based on purchased dark fibre inputs. These factors are likely to render dark fibre services unattractive for the significant majority of end-users purchasing LL services.
- 4.95 ComReg has also analysed the profile of end-users that currently purchase dark fibre services. The analysis indicates that these services would appear to be suitable for very large, sophisticated users such as large multinational cloud service providers. This evidence further suggests that only a niche customer segment requiring very high bandwidth and very large capacities would consider dark fibre services as a credible alternative to retail LL services.

Supply Side Substitution

- 4.96 ComReg notes that some of the SPs²²⁵ supplying dark fibre services are also active in the provision of retail LL services. Thus, the competitive constraint arising from these operators is already accounted for in ComReg's analysis.

Preliminary Conclusions on dark fibre as an effective substitute for a retail LL

- 4.97 For the above reasons, ComReg's preliminary view is that dark fibre services are not likely to be an effective substitute such that it would warrant their inclusion in either TI LL or MI LL markets. ComReg notes that the inclusion, or otherwise, of dark fibre services in either the TI retail LL or the MI retail LL markets is not likely to impact upon ComReg's assessment of competition in the WHQA markets given the relatively small demand for dark fibre services at the retail level.

²²⁴ Aurora, Digiweb, Eircom, enet, ESB, EU networks, Inland Fibre and Vodafone.

²²⁵ Digiweb, Eircom, EU Networks and Vodafone.

Retail LL Product Market Assessment

- 4.98 After assessing the considerations above, ComReg now considers the retail LL market(s) themselves, in particular ComReg:
- (a) outlines the reasons why retail LLs provided over an Ethernet network is considered to be the retail focal product (discussed in paragraph 4.100 to 4.109;)
 - (b) considers end-users' awareness of retail LL products and pricing given its relevance to switching behaviour (discussed in paragraphs 4.110 to 4.137);
 - (c) assesses the substitutability of TDM based retail LLs with the Ethernet focal product (discussed in paragraphs 4.144 to 4.174).
 - (d) assesses the substitutability of Analogue based retail LLs (discussed in paragraphs 4.175 to 4.187);
 - (e) considers whether there is likely to be a break in the chain of substitution for TDM and Analogue LLs such that it suggests separate markets broken out at a particular bandwidth (discussed in paragraphs 4.188 to 4.190).
 - (f) considers the reasons for including DWDM and other very high bandwidth interfaces as being in the same retail product market as Ethernet, which along with EFM is known as the MI market (discussed in paragraphs 4.191 to 4.203); and
 - (g) details the evidence to support ComReg's preliminary view that the geographic scope of the retail markets are national (discussed in paragraphs 4.204 to 4.238).
- 4.99 ComReg's then summarises its overall preliminary conclusions on retail LL markets in paragraphs 4.239 to 4.242.

Identifying the focal retail LL product

4.100 The European Commission's Notice on Market Definition and SMP Guidelines²²⁶ provide market definition principles that are useful and applicable when analysing markets, including retail markets. The first step involves identifying the focal product at the retail level which, once established, can then be used as the basis for assessing potential complement and/or substitute products.²²⁷

²²⁶ See paragraph 41 of the SMP Guidelines and paragraph 16 of the European Commission's Notice on Market Definition.

²²⁷ As noted in paragraph 13 of the European Commission's Notice on Market Definition, demand substitution constitutes the most immediate and effective disciplinary force on the suppliers of a product, and paragraph 15 notes further that "...the assessment of demand substitution entails a determination of the range of products which are viewed as substitutes by the consumer". For two products to be effective demand-side substitutes it is necessary that a sufficient number of customers are not only capable of switching between them, but would actually do so in response to a relative price change. As noted in paragraph 20 of the Commission's Notice on Market Definition, supply-side substitution may

- 4.101 The starting point for this retail market assessment is the retail LL for which demand is highest. As identified in paragraph 3.29 above, the majority of retail LL services are provided using an Ethernet interface (approximately 66% in 2015). This is in contrast to the market situation that pertained at the time of the 2008 Decision, where a trivial number of retail leased lines (3%) were provided over MI interfaces, and the overwhelming majority over TI interfaces. However, the data gathered by ComReg currently shows that the number of new orders of TI based retail LLs is trivial and the vast majority (90%) of new orders are for MI based retail LLs. There nonetheless remains a substantial installed base of retail TI LLs.
- 4.102 Figure 6 above indicates that the majority of retail LLs are provided over an Ethernet interface. Although for a small portion of demand, xWDM based retail LLs are being ordered, with these used to satisfy demand for very high bandwidth (>1G/s).
- 4.103 For the reasons outlined above, it is ComReg's preliminary view that the focal retail product is a LL carried on an Ethernet interface.

Does the focal product include other services purchased in a bundle with retail LL?

- 4.104 As noted in paragraph 3.49 above, most retail purchasers of LL services do not buy a retail LL on a standalone basis. Rather, LL are purchased in a bundle where various applications and services are purchased alongside the connectivity itself. These services can include, amongst others, Session Initiation Protocol ('SIP') voice, data storage (cloud services), back up and disaster recovery systems and Virtual Private Networks ('VPN').
- 4.105 However, ComReg's primary focus in relation to this market analysis is the local access. It is the local access portion of a circuit where potential competition problems are most likely to arise as it is here where the highest potential barriers to market entry may exist.
- 4.106 ComReg notes that the functionality and specific product characteristics of various LL technologies do differ, for example, retail demand that places a far higher utility on synchronicity vis-à-vis speed, may decide that TI based LLs are adequate to meet their business needs. On the other hand, retail demand that requires very high bandwidth connections, may consider xWDM based technologies the only viable connectivity to meet their requirements. In this regard, ComReg's analysis is concentrated on the access technology and its specific characteristics and not on the numerous and differentiated data services which may be provided over it.

also be taken into account where "...suppliers are able to switch production to the relevant products and market them in the short term without incurring significant additional costs or risks in response to small and permanent changes in relative prices".

4.108 At this point it is also worth recalling the product characteristics that constitutes a retail LL. The characteristics include a dedicated symmetric connection with low contention, jitter and latency, along with high level SLA's²²⁸.

Preliminary Conclusion on Focal Product

4.109 In light of the above, it is ComReg's preliminary view that LL services provided over an Ethernet interface (whether on a standalone basis or in a bundle with other services) is the focal product against which to assess alternative potential substitute products. If an alternative service is found to be an effective substitute for the focal product, it is included in the relevant product market.

Factors affecting the responsiveness of end-users to changes in retail LL prices

4.110 Having established a starting point for an examination of potential substitutes for retail LLs, ComReg will now discuss those factors that are likely to impact on the responsiveness of retail LL customers to changes in retail prices, and therefore the degree to which substitution is likely to occur in responses to a change in the price of the focal product.

4.111 When defining the relevant WHQA markets in Section 5 of this Consultation, ComReg will apply the SSNIP test²²⁹. For the purpose of assessing substitutes for retail LLs in this section, ComReg will apply a similar set of principles, though without it being necessary now to definitively conclude on the precise retail LL market (product and geographic) boundaries.

4.112 The 2014 Market Research indicated that the retail LL market appears to be characterised by relatively moderate levels of churn. For example, 45% of businesses have been with their current retail LL SP for 3 or more years, while only 20% have been with their current SP for less than 12 months²³⁰. This evidence indicates a degree of stickiness when it comes to switching SP.

4.113 With this in mind, in this section ComReg will discuss the following factors that impact on the switching behaviour of retail LL customers:

- (a) Retail LL pricing structures (discussed in paragraphs 4.114 to 4.115 below);
- (b) End-user awareness of cost of retail LL services (discussed in paragraphs 4.116 to 4.123 below); and
- (c) End-user sensitivity to changes in the price of LL services (discussed in paragraphs 4.124 to 4.133 below).

²²⁸ SLA(s) refer to Service Level Agreement(s).

²²⁹ The SSNIP test is an economic test as to whether or not a user would change supplier in response to a small but significant non-transitory increase in price.

²³⁰ The 2014 Market Research, slide 101.

Retail LL pricing structures

4.114 Retail LL pricing structures can influence the way in which retail LL purchasers select their SP. ComReg notes that in general, LL services are sold on a price-on-application ('**PoA**') basis and thus prices are not publicly available, although some SPs are advertising prices of low bandwidth ('**LB**') LL services²³¹. Nevertheless retail LL pricing structures can be identified as reflecting the following particular characteristics²³²:

- (a) The precise total cost of a LL service or a package of services including the LL service is usually determined on a bespoke basis following bilateral agreement between the consumer and the retail LL SP at the contract negotiation stage, although it would typically consist of connection/installation fee and recurring rental and service charges;
- (b) In general, connection/installation fees may depend on the geographic location and length of the connection from the end-user premises to the serving network node of the LL supplier;²³³
- (c) Recurring charges would depend on the requested access technology²³⁴ of the LL service, the required connection bandwidth as well as the nature of the SLA that is provided with the product; and
- (d) Discounts are frequently applied depending on the package of services (i.e. whether business customers require simple data connectivity or additional services such as cloud computing and other software services, SIP voice services etc.), the volume of LL circuits requested and the minimum contract term length.

4.115 As such, retail LL pricing structures can be considered to be somewhat complex, with a number of different factors affecting the cost to the customer. However, it is also worth noting that many of the purchasers of such retail LL services are institutional purchasers with dedicated ICT professionals in charge of the procurement processes.

End-user awareness of cost of retail LL services

4.116 In general, end-users of a service are only likely to materially change behaviour in response to an increase in retail prices if they are aware of the retail costs that they face when making purchasing decisions.

²³¹ For example, see Host Ireland's advertised services (<http://www.hostireland.com/our-products/>) as of 30 March 2016.

²³² The following analysis is based on the publicly available information as well as LL SPs responses to ComReg's Qualitative Questionnaire.

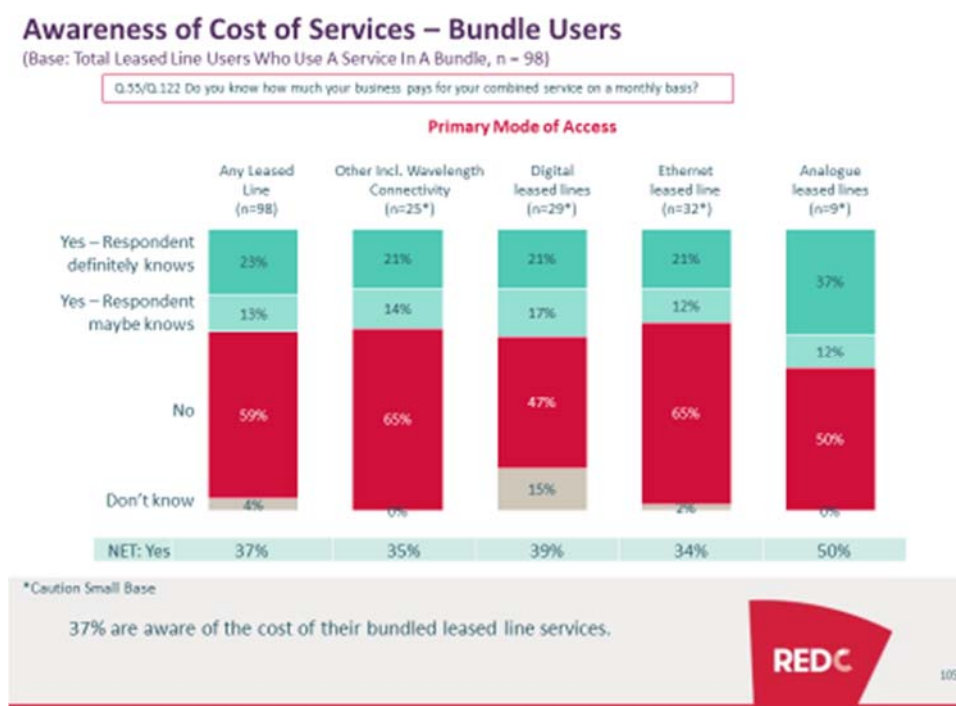
²³³ Connection and installation costs can vary by medium used. For instance, with P2P radio links costs differ from wired retail LLs. See paragraphs 4.64 to 4.74 for details.

²³⁴ Such as TDM, Ethernet, xWDM, etc.

4.117 As part of ComReg’s 2014 Market Research, respondents purchasing retail LL were asked to indicate the extent to which they were aware of the costs of retail LL service (if this service was purchased as a stand-alone service) and the costs of package of services (if retail LL service is purchased as part of a wider network solution or telecommunications package). Respondents’ views are set out in Figure 15²³⁵ and Figure 16 below.²³⁶

4.118 In terms of cost awareness of packaged services that include retail LLs, 37% of respondents were aware of the cost and only 23% stated that they definitely know the cost.

Figure 15: End user awareness of the cost of a package of services that includes retail LL service

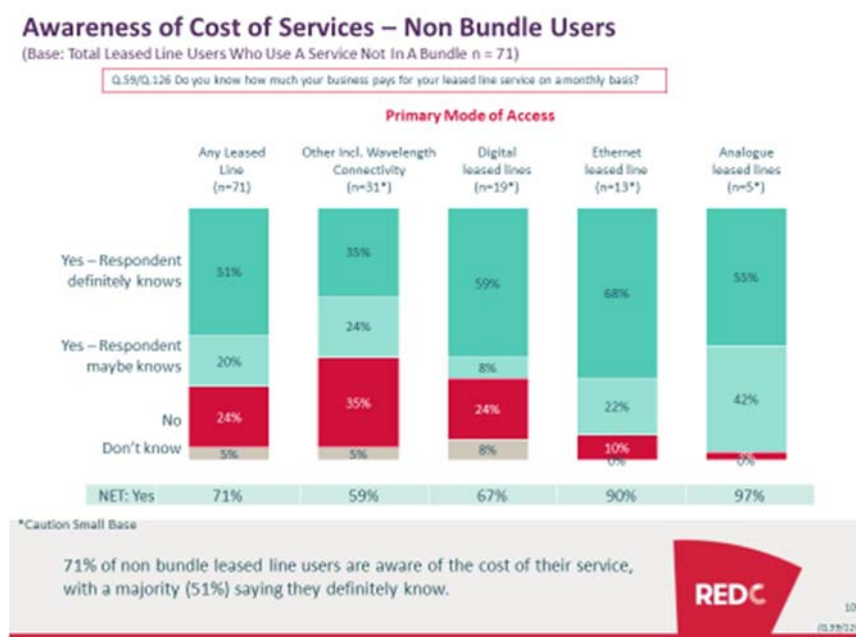


4.119 On the contrary, the cost awareness levels are significantly higher among respondents purchasing retail LL service as a stand-alone service. In this regard, 71% of respondents stated that they know the monthly cost of their retail LL service, with 51% stating that they definitely knew the cost.

²³⁵ The 2014 Market Research, slide 105.

²³⁶ The 2014 Market Research, slide 109.

Figure 16: End user awareness of the monthly cost of stand-alone retail LL service



- 4.120 On the basis of these responses, it suggests that businesses purchasing retail LLs as part of a wider package of services tend to have low levels of awareness about the monthly cost of their services especially when compared to cost awareness levels of businesses purchasing LLs as a stand-alone service. The lack of cost awareness may be related to the complexity of retail pricing structure particularly in cases where total cost relates to the provision of multiple services (such as cloud computing and/or SIP Voice services) and not just LLs. This complexity may potentially lead to information asymmetries²³⁷, which means that end-users are less likely to be aware of - and potentially responsive to - changes in the pricing of retail LL services.
- 4.121 Nevertheless, ComReg notes that end-users are likely to be more aware of specific costs at the time when they choose a LL SP. As noted in paragraph 4.114 above, the precise cost of LL services or a package of services including LL service is usually determined on a bespoke basis following bilateral agreement between the end-user and the retail LL SP at the contract negotiation stage. End-users of LL services also tend to purchase retail LL services through a procurement process that involves tendering and this allows them to compare the service costs (among other factors) when selecting their LL SP. Hence, prices of LL services either directly or indirectly are likely to impact on business decisions when it comes to choosing a retail LL SP.

²³⁷ Information asymmetry refers to the situation where one party to a transaction has more information than the counterparty.

4.122 Furthermore, as part of the Qualitative Questionnaire, LL SPs were also asked to rank business end-users' levels of awareness of LL characteristics when choosing or switching LL SP. Table 7 shows that all LL SPs that responded to the Qualitative Questionnaire considered that business end-users have high cost awareness, in particular, when choosing their LL SP at the procurement stage. 86% of respondents believed that businesses had high awareness of the degree of service availability while 71% noted that business were also highly aware of set up and installation costs as well as the service's download speeds.

Table 7: Businesses awareness of LL characteristics when choosing a LL SP

Awareness levels (7 responses)	High awareness	Some awareness	Total
Recurring cost	100%	0%	100%
Degree of availability (% of time service is working - a measure of reliability of service)	86%	14%	100%
Set up and installation costs	71%	29%	100%
Bandwidth - download speed	71%	14%	86%
Bandwidth - upload speed	43%	29%	71%
Service level guarantees	43%	29%	71%
Latency (a measure of the end to end delay in transmission of data)	29%	57%	86%
Security	29%	57%	86%
Contention (an uncontended service reserves all the available bandwidth for the exclusive use of one customer; a contended service shares the available bandwidth among more than one user)	29%	43%	71%
Resilience (provides a back-up connection option to provide greater reliability)	29%	43%	71%
Jitter (a measure of variation of delay in transmission of data)	29%	29%	57%
Symmetry (a symmetric service guarantees the same upload and download bandwidth)	29%	29%	57%
Bundled products / packages	14%	57%	71%
Synchronisation (e.g. network timing for telephone voice services)	14%	29%	43%
Range (the distance between end-user premises over which the service is available)	14%	14%	29%

4.123 ComReg notes that the high awareness of recurring costs attributed to end-users by SPs' responses conflicts with the responses to the Business Survey shown in Figure 15 and Figure 16 above.

End-user sensitivity to changes in the price of LL services

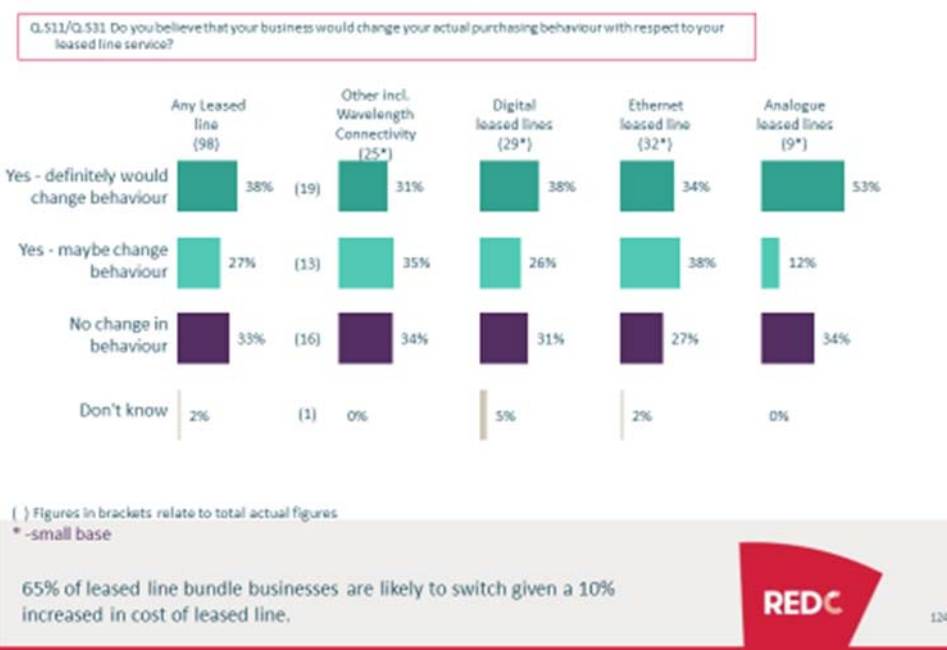
- 4.124 End-user sensitivity to changes in prices is important when assessing the propensity of businesses to switch to alternative services, in particular, in responses to an increase in the price of retail LLs. Such considerations are of relevance to ComReg's assessment of potential retail market substitutes for retail LLs and the assessment of the strength of any indirect constraints imposed from the retail LL market on the wholesale LL market.
- 4.125 ComReg notes that subscriber sensitivities to cost will differ based on individual preferences and the costs. In order for a business end-user to be in a position to react to any retail price increases for retail LL, it would need to be:
- (a) sufficiently aware of the retail costs of a LL service; and
 - (b) sufficiently concerned about cost, such that it warrants some change in their behaviour.
- 4.126 As noted in paragraph 4.120 above, the 2014 Market Research identified that businesses purchasing LL as part of a wider package of services tend to have low level of awareness of monthly costs of their package of services in contrast to businesses that purchase retail LL as a stand-alone service. However, price awareness is likely to be higher at the time when businesses tend to renew their contracts with SPs. In this regard, the 2014 Market Research indicated that 70% of LL service purchasers claimed to have an ability to negotiate terms and conditions of their service including - but not limited to - lower prices²³⁸.
- 4.127 As part of the 2014 Market Research, ComReg asked business respondents about their likely responsiveness to hypothetical price increases. Respondents were grouped according to whether they purchase retail LL as a stand-alone service or part of a broader package of services.
- 4.128 Respondents purchasing LLs as part of a broader package of services were asked about their reaction to a 10% increase in the price of a retail LL service (thus, resulting in an increase in the price of the total package of service). Figure 17 shows that 65% of respondents said that they would either definitely (38%) or possibly (27%) change their actual purchasing behaviour following such a hypothetical price increase²³⁹.

²³⁸ The 2014 Market Research, slide 104.

²³⁹ The 2014 Market Research, slide 124.

Figure 17: Reaction of businesses purchasing LL as part of a broader package of services to a 10% increase in the price of retail LLs

Response to 10% Increases in Leased Line – Leased Line Bundle Users
 (Base: Total Leased Line Users in bundle – n=98)

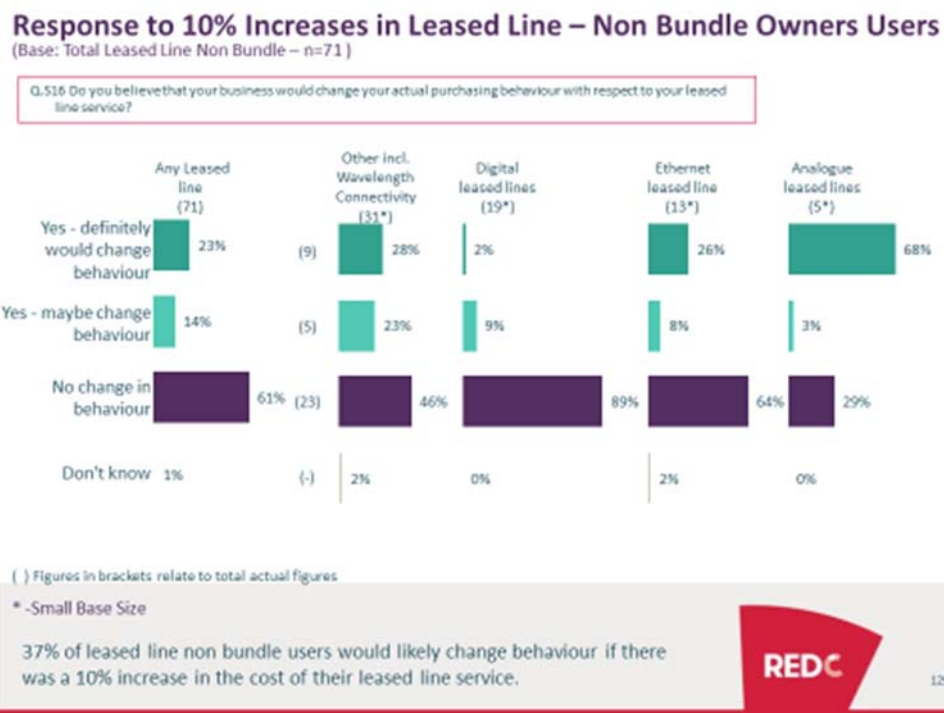


4.129 Similarly, respondents purchasing stand-alone a retail LL service were asked about their reaction to a 10% increase in the price of a retail LL service. Figure 18 shows that, in contrast to purchasers of bundled LL services, only 37% of respondents indicated that they would either definitely (23%) or possibly (14%) change their actual purchasing behaviour following such hypothetical price increase²⁴⁰ which indicates a lower level of price sensitivity.

4.130 However, ComReg considers it important to note that when retail LLs are purchased as part of a bundle of related services, the actual cost of the retail LL may be obscured to the end-user. As such, an increase in the price of a retail LL of 10% may not be passed through to a 10% increase in the price of the bundle of services. As such, there may be an overestimation of the reaction to price increases.

²⁴⁰ The 2014 Market Research, slide 129.

Figure 18: Reaction of businesses purchasing LL as a stand-alone to a 10% increase in the price of retail LL



- 4.131 Furthermore, ComReg considers that the proportion of overall operating costs attributed to retail LLs will impact on their sensitivity to changes in the price of retail LLs.
- 4.132 LL SPs were also asked to rank the most important characteristics for businesses when choosing a LL SP as part of ComReg’s Qualitative Questionnaire.
- 4.133 Table 8 below illustrates that the majority of LL SPs that responded to ComReg’s Qualitative Questionnaire (89%) listed recurring cost as the most important characteristic for retail customers when choosing a LL SP. This was followed by the degree of availability (78%) and upload speed (67%). Hence, in retail LL SPs’ views, business end-users purchasing retail LL services tend to have high a higher valuation on price relative to other characteristics.

Table 8: Importance of LL characteristics to businesses when choosing LL SP

Importance of LL characteristics when choosing LL SP (9 responses)	Most important (ranked 1)	Important (ranked 2)	Sum
Recurring cost	89%	0%	89%
Degree of availability (% of time service is working - a measure of reliability of service)	78%	11%	89%
Bandwidth - upload speed	67%	11%	78%
Bandwidth - download speed	56%	22%	78%
Set up and installation costs	44%	44%	89%
Contention (an uncontended service reserves all the available bandwidth for the exclusive use of one customer; a contended service shares the available bandwidth among more than one user)	44%	22%	67%
Service level guarantees	44%	22%	67%
Security	22%	44%	67%
Latency (a measure of the end to end delay in transmission of data)	11%	33%	44%
Resilience (provides a back-up connection option to provide greater reliability)	11%	33%	44%
Symmetry (a symmetric service guarantees the same upload and download bandwidth)	11%	33%	44%
Bundled products / packages	0%	56%	56%
Jitter (a measure of variation of delay in transmission of data)	0%	44%	44%
Synchronisation (e.g. network timing for telephone voice services)	0%	33%	33%
Range (the distance between end-user premises over which the service is available)	0%	11%	11%

Preliminary conclusion on factors affecting the responsiveness of end-users to changes in retail LL prices

4.134 In paragraphs 4.110 to 4.133 above ComReg has examined a number of factors that are likely to affect the responsiveness of end-users to changes in retail LL prices. This included a review of the typical pricing structure of retail LL services along with reviewing the 2014 Market Research respondents' views concerning their awareness and sensitivity in relation to the pricing of retail LLs.

4.135 Overall, respondents purchasing LL as part of a broader package of services reported a low awareness of costs of purchased services. In contrast, the majority of respondents purchasing LL as a stand-alone service were able to provide an estimate of charges of purchased LL services.

- 4.136 In terms of sensitivity to changes in price of retail LL services, the majority of businesses purchasing LLs as part of a broader package of service indicated that they would change their actual purchasing behaviour if the price of LL service would increase by 10%. On the contrary, the majority of respondents purchasing LL as a stand-alone service would not alter their behaviour after 10% increase in the price of their service.
- 4.137 Despite end-users having various degrees of retail LL cost awareness as well as differing levels of sensitivity to changes in these costs, most businesses purchasing LL services have noted that they have an ability to negotiate terms and conditions with their SP. This indicates that some LL purchasers are likely to have some degree of cost awareness and sensitivity to changes in LL prices, in particular, when selecting their retail LL SP and during contract negotiation stage.

Retail Product Market Assessment

Overview

- 4.138 ComReg's starting point is to examine whether the following services are likely to be considered by retail end-users as effective substitutes for a LL with an Ethernet Interface. ComReg considers whether retail LLs of different interfaces are in the same product market as the focal product. In doing so ComReg considers:
- whether a retail LL with a TDM interface is an effective substitute for a LL with an Ethernet interface (discussed in paragraphs 4.144 to 4.174);
 - whether Analogue and Digital LLs are considered to be in the same market as TDM (discussed in paragraphs 4.175 to 4.187);
 - considers whether there is likely to be a break in the chain of substitution for TDM and Analogue LLs such that it suggests separate markets broken out at a particular bandwidth (discussed in paragraphs 4.188 to 4.190); and
 - if xWDM and other high capacity MI LLs are in the same market as Ethernet (discussed in paragraphs 4.191 to 4.203).
- 4.139 In Table 9 below ComReg sets out the key characteristics of the focal product and various potential substitutes considered in the assessment of the relevant product market. These potential substitutes are considered across the range of relevant substitutability criteria set out in the European Commission's Notice on Market Definition, according to which a relevant product market:

*"The relevant product market comprises all those products and/or services which are regarded as interchangeable or substitutable by the consumer, by reason of the products' characteristics, their prices and their intended use"*²⁴¹.

²⁴¹ See paragraph 7 of the European Commission's Notice on Market Definition.

- 4.141 ComReg's retail market analysis therefore covers an assessment of the technical characteristics (functionality) and price of LLs, and any available data regarding consumer usage trends/behaviour. It also considers whether a sufficient number of users are likely to switch to using any such potential substitutes in response to a 5-10% increase in the retail price of LL services.
- 4.142 In terms of analysing possible behavioural changes by consumers and businesses, ComReg considers each of the possible options for replacing broadband service provided over a copper network with alternative forms of broadband access.
- 4.143 ComReg also considers supply-side substitution which examines whether in response to a SSNIP in the market for the focal product, an operator in another market could potentially enter the market for the focal product by switching production inputs in order to offer the focal product. If supply side substitution is possible, then a potential entrant could enter the market for the focal product and deem any SSNIP unprofitable for a HM. In this case, it may be appropriate to broaden the definition of the market to include products similar to the focal product.

Table 9: Overview of product characteristics

Product characteristic/LL Type	Ethernet LL		Analogue LL	DWDM and other MI LL	Wireless LL	Business Broadband	EFM	Dark Fibre
Download Speeds	From 64 kbps to over 100Gb/s	From 64 kb/s to 10Gb/s (STM-64)	56Kb/s	1Gb/s to >100Gb/s	Up to 1Gb/s	100Mb/s	20Kb/s	N/A
Upload Speeds	From 64 kbps to over 100Gb/s	From 64 kb/s to 10Gb/s (STM-64)	56Kb/s	1Gb/s to >100Gb/s	Up to 1Gb/s	20Mb/s	20Kb/s	N/A
Service availability	99.95% uptime, or 4 hours downtime per year						N/A	N/A
Contention	Uncontended (NG Ethernet can be engineered to meet customer requirement)					Some bandwidth can be provided with CoS	Can be engineered	N/A
Latency/Jitter	Low –depends on CoS (Class of Service) requested	Specific levels guaranteed	N/A	Low	Low –depends on CoS (Class of Service) requested	Some bandwidth can be provided with CoS	Low –depends on CoS (Class of Service) requested	N/A
Resilience	Can be engineered to meet customer requirement		N/A	Can be engineered to meet customer requirement	Can be engineered to meet customer requirement	N/A	Can be engineered to meet customer requirement	N/A
Synchronisation	Sync E specifications (ITU-T G.8261) comparable to SDH	Supported	N/A	Supported	Supported	N/a	Supported	N/a
Typical Price Range (incl. VAT)	Not publicly available. Typically sold on price-on-application basis.	Not publicly available. Typically sold on price-on-application basis.	Not publicly available. Typically sold on price-on-application basis.	Not publicly available. Typically sold on price-on-application basis.	Not publicly available. Typically sold on price-on-application basis.	€72 - €395 (business)	Not publicly available. Typically sold on price-on-application basis.	Not publicly available. Typically sold on price-on-application basis.

Are retail TDM LLs an effective substitute for Ethernet LLs?

- 4.144 A Digital interface LL based on legacy TDM technical transmission standards, including Plesiochronous Digital Hierarchy ('PDH') and Synchronous Digital Hierarchy ('SDH'), is a circuit based technology, which allocates each user to specific time-slots on a transmission link. TDM LLs have stable and predictable transmission characteristics, low transmission delay (latency) and low jitter (variation in transmission delay). These characteristics are important for some end-user applications (e.g. telemetry SCADA²⁴² applications where speedy response times are required). TDM LL are available in bandwidths ranging from 64 Kb/s up to 2.5 Gb/s. However, as highlighted in Figure 9 above, the majority of TDM LL purchased by businesses in Ireland support bandwidth below or equal to 2Mb/s.
- 4.145 In paragraphs 4.146 to 4.174 below ComReg considers the extent to which TDM based LL services may represent an effective substitute for retail Ethernet based LLs.

Demand Side Substitution

Product Characteristics

- 4.146 Table 9 above compares product characteristics of TDM and Ethernet LL services. It shows that a number of qualitative characteristics of these services are very similar. While Ethernet services cannot exactly match all of the characteristics of TDM LL such as latency/jitter or synchronisation to the very high specification, these differences appear to be less of an issue as mainstream applications used by businesses migrate to Ethernet/IP technologies and thus the product characteristics that differentiated retail TDM LLs from retail Ethernet LLs appear to become less important. As highlighted in paragraph 3.29 above, the number of TDM LL circuits being purchased is in decline as LL purchasers migrate to Ethernet LL services.
- 4.147 In this regard, the 2014 Market Research indicated that purchasers of TDM and Ethernet LLs tend to place similar values on various product attributes. In particular, service availability, download speed and resilience were cited by the majority of respondents purchasing either TDM or Ethernet LL as important or very important service characteristics²⁴³. The 2014 Market Research suggested that Ethernet LL purchasers may place higher value on latency compared to TDM LL purchasers²⁴⁴, but given that Ethernet is not technically superior to TDM in terms of latency, no specific advantage can be attributed to Ethernet.

²⁴² Supervisory Control and Data Acquisition systems used for remote control and monitoring of numerous equipment and processes e.g. utility plant, water flows, etc.

²⁴³ The 2014 Market Research, slide 88.

²⁴⁴ 96% of Ethernet LL purchasers noted that latency is important or very important service characteristic compared to 70% among TDM LL purchasers.

4.148 Nevertheless, ComReg notes that there are end-users for whom the characteristics of time synchronisation and low latency of TDM LL may be important and their equipment is configured for TDM interfaces. For example, utility operators such as CIE and ESB use low bandwidth TDM LLs for remote monitoring of their networks. Such end-users using legacy applications that do not require high bandwidth, may consider that TDM based retail LLs are sufficient to meet their demands, and may not consider switching to an Ethernet based service, even in the context of a price rise in the TDM service.²⁴⁵

Pricing

4.149 In the absence of available retail pricing information, ComReg has had regard to Oxera's analysis²⁴⁶ of Eircom's regulated wholesale input prices as a proxy for the competitive retail price benchmark for comparing price ranges for TDM and Ethernet LLs. These prices are cost orientated²⁴⁷ and thus, in ComReg's view, should be a reasonably good proxy for prices that would arise in a competitive market outcome. This approach has been used elsewhere, for example in the U.K., Ofcom used the regulated price to calculate the overall value of the market using circuit volumes as it considered pricing information was unreliable.²⁴⁸ ComReg adopted this approach due the wide disparity in retail pricing information provided by SPs in their response to our SIRs, as outlined in Appendix: 3 dealing with data treatment. Using average pricing for retail LLs presented challenges due to the limited geographic information and absence of LL local access length/distance information. There was also a notable outlier, 3<[REDACTED], whose retail pricing was, in a number of cases, far higher than other SPs.

²⁴⁵ There is a one-off cost to switching to Ethernet. See paragraphs 4.160 to 4.162 below for more details.

²⁴⁶ See pages 47-49 of the Oxera Report.

²⁴⁷ See "[A final decision further specifying the price control obligation in the market for wholesale terminating segments of leased lines, ComReg Document 12/03, Decision D02/12](#)", dated 2 February 2012. In this Decision ComReg specified that it will apply cost orientation to determine maximum PPC charges using BU-LRAIC plus model while for WLLs the maximum charges will be based on the published prices (at the time) as well as a minimum price floor which is set on the basis of the appropriate MST between WLLs and PPCs on a SEO basis.

²⁴⁸ See <http://stakeholders.ofcom.org.uk/consultations/bcmr-2015/final-statement/> for more details.

4.150 Table 10 below compares the relative prices of a 2 Mb/s single-end²⁴⁹ TDM circuit²⁵⁰ and 10Mb/s single-end Ethernet circuit²⁵¹ from a wholesale LL purchasers' interconnection point to an end-user premises location containing all of the required wholesale inputs. Prices are compared in three different scenarios where assumed main link distance is either 0, 15 or 30 kilometres²⁵².

Table 10: Relative price comparison of TDM and Ethernet LL

	TDM LL, 2Mb/s, annual rental	Ethernet LL, 10Mb/s, annual rental
Local node/no main link (TDM), Local node (Ethernet)	€2,330	€3,242
15km main link (TDM), same region (Ethernet)	€6,315	€3,492
30km main link (TDM), urban to rural region (Ethernet)	€8,995	€4,556

4.151 The price comparison in Table 10 above indicates that a 10 Mb/s Ethernet circuit is significantly cheaper than a 2 Mb/s TDM circuit for distances that require core conveyance i.e. where assumed main link distance is either 15 or 30 kilometres. Thus, a 10% price increase in the price of Ethernet LL is unlikely to lead to a migration from Ethernet to TDM based LL. Furthermore, as the bandwidths do not match, users requiring more than 2Mb/s at any distance are unlikely to choose to combine multiple TDM services when a single 10 Mb/s Ethernet circuit is cheaper²⁵³. Thus, evidence presented in Table 10 above would suggest that TDM LL is not be considered as effective substitute to an Ethernet LL due to the differential in prices where a 2 Mb/s LL is more than 10% more expensive where core conveyance is required.

Intended Use

4.152 In the 2014 Market Research respondents purchasing LL services were asked to indicate what they are using their services for.

²⁴⁹ A single ended PPC is the circuit from the customer premises to the PoH.

²⁵⁰ As noted in paragraph 3.45 above, the majority of retail TDM circuits have bandwidth below or equal to 2Mb/s.

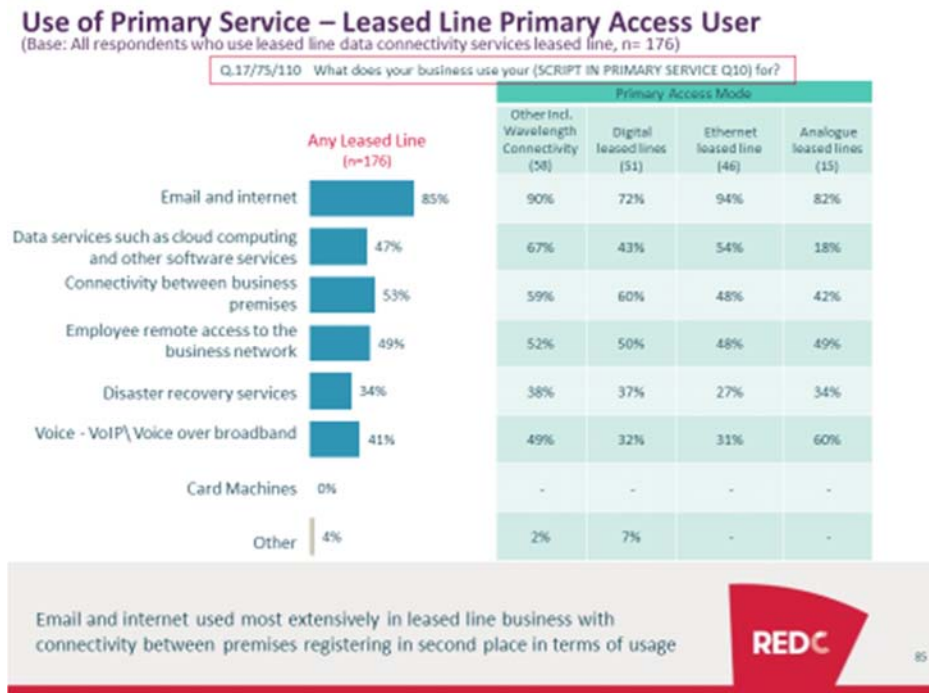
²⁵¹ Eircom's NGN Ethernet products are only offered at speeds at or above 10Mb/s. As noted in paragraph 3.45, the large majority of in-situ Ethernet circuits have bandwidth greater than 2Mb/s.

²⁵² See Oxera Report; Section 3.1.3.

²⁵³ In this example, end-user requiring service of 10Mb/s bandwidth would have to purchase five 2Mbps TDM circuits.

4.153 Figure 19 below illustrates that businesses purchasing Ethernet LL are more likely to use their service for emails and accessing Internet as well as accessing data service such as cloud computing when compared to purchasers of TDM LL²⁵⁴. On the other hand, TDM users are more likely to use their service for connectivity between business premises and disaster recovery services²⁵⁵.

Figure 19: Intended use of primary LL service by end-users



4.154 ComReg has also analysed the profile of businesses that purchase TDM and Ethernet LLs in order to ascertain whether these services are purchased for different purposes. This analysis supports the 2014 Market Research findings and indicates that TDM LLs are predominantly used by utility operators as well as financial, transport and government institutions for activities that do not require high bandwidth services such as remote network monitoring, critical system control and secure transactional applications. However, some of the 2 Mb/s TDM LLs are also used by corporate entities to form a part of a generic inter-site connectivity, thus suggesting that these circuits can be used for more general applications. However, by virtue of the low bandwidth, such circuits are likely to be of limited utility for broadband, cloud and other such services requiring higher speeds.

²⁵⁴ For example, 94% of respondents purchasing Ethernet LL use their service for emails and accessing Internet compared to 72% of respondents purchasing TDM LL.

²⁵⁵ For example, 60% of respondents purchasing TDM LL use their service for connectivity between their business premises compared to 45% of respondents purchasing Ethernet LL.

4.155 The profile of Ethernet LL purchasers is similar to the profile of TDM purchasers with utility operators, government institutions and corporate entities purchasing Ethernet LLs. However, Ethernet LL services are also purchased by schools,²⁵⁶ as well as providers of cloud and data centre services. In general, end-users that require higher bandwidth for data networking purposes tend to purchase Ethernet as opposed to TDM based retail LLs.

Substitution

4.156 ComReg has highlighted the trend of migration from TDM to Ethernet based LL services in paragraph 3.29 above. In particular, most end-users purchasing LL services with bandwidth in excess of 2Mb/s have already migrated to MI based LL²⁵⁷. However, as noted in paragraph 3.30 above, at the end of Q4 2015 TI LLs accounted for 33.8% of all retail LL circuits. As such, the installed base of such LLs is still substantial.

4.157 While TDM LLs are still being ordered by end-users²⁵⁸, the migration to Ethernet and/or other high bandwidth based retail LL services would suggest that there is asymmetric substitution between these services in that there are significant more end-users switching from TDM to Ethernet based LLs. There is no evidence of any retail user of Ethernet LLs switching to TDM based retail LLs. TDM based customer premises equipment ('CPE') is now reaching obsolescence and is no longer being produced by manufacturers and it is therefore unlikely that a retail customer using Ethernet LLs could revert to TDM LL service.

4.158 The 2014 Market Research also highlighted asymmetric substitution patterns between TDM and Ethernet LL. For example, only 3% of respondents purchasing TDM based LLs noted that they were previously using Ethernet based LLs²⁵⁹. In comparison, 21% of respondents purchasing Ethernet based LLs noted that they were previously using TDM based LLs²⁶⁰.

4.159 This evidence would suggest that HM of Ethernet LL services is likely to be able to sustain a SSNIP in the range of 5-10% above the competitive level without a substantial number of customers switching to TDM LL services.

4.160 Responsiveness to a SSNIP might also be limited or delayed by the existence of switching costs when migrating between LLs with different interfaces. Such switching barriers include:

²⁵⁶ HEAnet manages the schools network on behalf of the Dept. of Education. For more details see <http://www.heanet.ie/schools/broadband-for-schools-programme>.

²⁵⁷ TI based LL circuits with bandwidths greater than 2Mb/s constitute just 3.5% of all active TI LLs.

²⁵⁸ For example, there were 3<[redacted] TDM retail LL being ordered from Eircom in 2015. Source; Eircom response to SIR.

²⁵⁹ The 2014 Market Research, Slide 119.

²⁶⁰ *Ibid.*

4.165 Some respondents also noted that there is still a significant number of retail TI LL being purchased by businesses and that the migration to MI LL is relatively slow. In general, respondents agreed that the requirement to upgrade end-user equipment such as PABX when migrating to MI LL may be a switching barrier. However, SPs' views in relation to the effect of the one-off switching costs as a barrier to switching differed with some respondents considering equipment replacement costs as "*relatively modest*".²⁶⁴

Supply Side Substitution

4.166 Supply side substitution could potentially broaden the relevant markets only in instances where the constraint arising from the supply side substitution provides an additional constraint that was not already considered as part of demand side substitution analysis i.e., SPs that are already providing services considered to be part of the relevant markets cannot provide an additional supply side substitution constraint.

4.167 In this regard, ComReg notes that, as highlighted in Table 1²⁶⁵ above, currently SPs providing retail TDM LLs also supply Ethernet LLs. Given the general trend of end-users migration to Ethernet LL, all TDM LL SPs have developed Ethernet LL products and thus, any competitive constraints arising from the presence of these SPs in the retail LL market are already accounted for through via demand side substitution analysis.

4.168 However, any current Ethernet based retail LL SP is unlikely to begin to supply TDM based circuits due to the necessary investment costs that may be stranded as the market is declining.

Asymmetric Substitution between TDM and Ethernet based retail LLs

4.169 Asymmetric substitution occurs where one product is considered to be a substitute for another, but the reverse is not the case. As the OECD has noted in relation to telecommunications markets:

*"The process of defining relevant markets can also be complicated by the existence of asymmetric (one-way) substitution. In telecommunications, one way substitution is likely to take place with respect to switching from less capable networks and services to more capable ones, but not the other way round."*²⁶⁶

²⁶⁴ *Ibid.*

²⁶⁵ See paragraph 3.3 above.

²⁶⁶ paragraph 2.3: Defining the relevant market in Telecommunications; OECD 2014.

4.170 Furthermore, when substitution analysis indicates that substitution is only in one direction, then it can indicate in certain circumstances, that there is a break in the chain of substitution sufficient to warrant the product being considered in different markets.

“... if there is no substitution from the focal product to the alternative product(s) - and only substitution from the alternative product(s) to the focal product- the alternative product(s) should not be included in the market.”²⁶⁷

SPs’ views

4.171 10 of the 11 SPs who responded to the Qualitative Questionnaire²⁶⁸, addressed the issues of substitutability between TI and MI based LLs. Table 11 below gives a brief description their views.

Table 11: SPs’ views on substitution between TDM and Ethernet LL [PARTIALLY REDACTED]

SP	Response
✂ [REDACTED]	Yes
✂ [REDACTED]	No
✂ [REDACTED]	Somewhat
✂ [REDACTED]	Somewhat
✂ [REDACTED]	Somewhat
✂ [REDACTED]	Not answered
✂ [REDACTED]	Yes
✂ [REDACTED]	No
✂ [REDACTED]	No
✂ [REDACTED]	No
✂ [REDACTED]	No
✂ [REDACTED]	Somewhat

4.172 As can be seen from Table 11, five SPs do not consider TDM based LL services to be substitutes for Ethernet based LL services at the retail level. Four consider that they are somewhat substitutable in certain circumstances, such as where the customer only requires low bandwidth.²⁶⁹

²⁶⁷ P14: BOR 11 (54).

²⁶⁸ Q 21 of the Qualitative Questionnaire.

²⁶⁹ ✂ [REDACTED], ✂ [REDACTED], ✂ [REDACTED].

Preliminary Conclusions on whether TDM is an effective substitute for Ethernet LLs

- 4.173 Having considered relevant demand side factors including functionality, pricing and consumer usage, as well as relevant supply side factors, ComReg's preliminary view is that TDM LL is not an effective substitute for Ethernet LL. While the majority of product characteristics are similar, the general trend of migration from TDM to Ethernet based LL as well as the observed differences in pricing and use of these services (TDM LL are generally used for applications that do not require high bandwidth) indicates that Ethernet LL purchasers would not view TDM LLs as a viable substitute.
- 4.174 Therefore, ComReg is of preliminary view that Ethernet and TDM LL are in separate product markets. In the paragraphs below ComReg will consider whether other potential substitutes can be regarded as effective substitutes for either an Ethernet or TDM LL.

Is an analogue LL an effective substitute for either a TDM or Ethernet LL?

- 4.175 In the following section ComReg considers whether retail based LLs that offer similar speeds and characteristics either to TDM or Ethernet based retail LLs should be considered effective substitutes for these respective LL services.
- 4.176 Analogue LLs are dedicated direct connections linking two sites using standard copper access lines usually used to provide PSTN services. These can support private voice services, and may be used as a permanent voice connections between business locations, as commonly used by financial service institutions. They can also support data services where customers can connect analogue to digital modems, e.g. V.34²⁷⁰ modems, which can support up to 28.8Kb/s data transfer rates. These are often used by utilities and local authorities for telemetry purposes.
- 4.177 In paragraphs 4.178 to 4.187 below ComReg considers the extent to which analogue LL services may represent an effective retail substitute for either Ethernet based or TDM based LL.

²⁷⁰ ITU modem standard.

Demand Side Substitution

Product Characteristics

- 4.178 Analogue and low bandwidth TDM LL offer broadly equivalent functionality as they are using the same technology. Therefore, many of the TDM LL characteristics outlined in Table 9 above are also exhibited by analogue LL. For example, analogue LL can transmit digital information while TDM can transmit analogue signals. Analogue LL can support bandwidth of up to 56 Kb/s which is very close to the lower end of bandwidth range provided by TDM LL (64 Kb/s).
- 4.179 Thus, ComReg's preliminary view is that due to the low speed and legacy nature of the technological standards, analogue LL are share many of the characteristics of TDM based retail LLs.

Pricing

- 4.180 In the absence of retail pricing information, ComReg has relied on Oxera's analysis of Eircom's wholesale prices for analogue and TDM LLs²⁷¹. Oxera's analysis highlighted that the price of analogue LL is similar to the price of TDM end-user link supporting 64kb/s bandwidth.²⁷² Thus, there does not appear to be a significant break between price ranges of analogue and TDM LLs up to 2 Mb/s.²⁷³

Intended Use

- 4.181 Figure 19 above indicates that analogue LLs are used, in some cases, in a similar way to other LL services with 82% of analogue LL purchasers using their service for accessing emails and some other data services, 60% for voice services and 49% for remote access to the business network²⁷⁴. ComReg also looked at the profile of businesses that purchase analogue LLs. Similarly to TDM, analogue LLs are predominantly used by utility operators as well as financial, transport and government institutions for activities that do not require high bandwidth services such as remote network monitoring, critical system control and secure transactional applications. This is in contrast to Ethernet based retail LLs which are typically of higher bandwidths and used for data services, alongside e-mail and VPN's.²⁷⁵

²⁷¹ Oxera Report, Section 3.2.2.

²⁷² Oxera Report, Table 3.6.

²⁷³ It is important to note that this holds for analogue and TDM. However, ComReg has found a break at 2Mbs for the pricing of these services. See paragraphs 4.188 to 4.190 below for details.

²⁷⁴ The 2014 Market Research, slide 85. ComReg notes that the base number for analogue LL purchasers is relatively compared to purchasers of other LL services and hence, some of the reported results are not statistically significant.

²⁷⁵ *Ibid.*

Substitution

4.182 Similarly to TDM LLs, the users of analogue LLs are generally migrating towards MI based LL services. As highlighted in Figure 6 above²⁷⁶, the number of analogue LLs has decreased to 1,974] at the end of 2015 down from 2,081 in 2014 and 2,227 in 2013. While there is no evidence of substantial switching between TDM and analogue LLs²⁷⁷, ComReg considers that these LL services are likely to exhibit similar asymmetric substitution i.e. both TDM and analogue LL users are migrating to a degree towards MI based LLs.

SPs' views on substitutability between Analogue and other LL products

4.183 ☒ [REDACTED] was of the view that analogue LL cannot be regarded as an effective substitute to any other type of retail LL. In its view, analogue LL are commonly used for voice services and that in general, different equipment is used for terminating these services compared to other type of LL.²⁷⁸

Supply Side Substitution

4.184 ComReg notes that retail analogue LL SPs also tend to supply retail TDM LL services. Thus, the competitive constraint arising from providers of analogue LLs is already considered in the demand side substitution analysis above.

Preliminary Conclusions on whether Analogue LLs are an effective substitute for TDM LLs and Ethernet LLs

4.185 Having considered relevant demand side factors including functionality, pricing and consumer usage, as well as relevant supply side factors, ComReg's preliminary view is that analogue LLs fall within the same relevant retail product market as TDM LLs but not in the same product market as Ethernet LLs.

4.186 Analogue and TDM LLs have sufficiently similar product characteristics and are used in a similar way by end-users.

4.187 As such. ComReg is of the preliminary view that these products are in the same retail product market. Analogue and TDM LLs, are referred to throughout this Consultation as the Traditional Interface ('TI') LLs.

²⁷⁶ See paragraph 3.27 above.

²⁷⁷ The 2014 Market Research indicated that only 9% of respondents who switched their service provider in the past and are currently purchasing TDM services previously purchased analogue LLs.

²⁷⁸ Response to Qualitative Questionnaire.

Break in the bandwidth chain of substitution in the retail TI market at 2Mb/s

- 4.188 Notwithstanding the fact that there is no discernible pricing break between analogue and TDM retail LLs up to 2 Mb/s²⁷⁹, ComReg considers that the conditions of competition between TDM LLs above 2Mb/s and those at and below 2 Mb/s are sufficiently heterogeneous as to be considered to fall within separate product markets. In Section 5²⁸⁰ below ComReg notes that Oxera's TDM bandwidth price analysis²⁸¹ indicates a break the chain of substitution at 2 Mb/s (and below) due to the pricing of TDM products with bandwidths above 2 Mb/s, which leads to ComReg's preliminary view that TI LLs above 2 Mb/s are likely to constitute a separate product market.
- 4.189 ComReg considers that such break in pricing is also likely to exist at the retail level, given that SPs will pass through at least some of the wholesale price differences to their retail customers.
- 4.190 Moreover, it should also be noted from Figure 9 above that there are only 149 retail TDM LLs currently being sold as the majority of end-users have already migrated to MI based Ethernet (and other) LL services. This represents 2.8% of all retail TI LLs. ComReg notes that the identification of TI TDM based LLs above 2 Mb/s (referred to as '**High Bandwidth TI LLs**') as falling within a separate market to retail TI (TDM and analogue) LLs at and below 2 Mb/s (referred to as '**Low Bandwidth TI LLs**') is not likely to impact upon ComReg's overall assessment of competition in the relevant WHQA markets given the relatively small amount of these High Bandwidth TI LLs sold at the retail level.

Are xWDM and other very high bandwidth LL services effective substitutes for Ethernet retail LLs?

- 4.191 xWDM is a transmission technology originally used by network operators to provide optical fibre links with very high capacity within their networks. It is now increasingly being used by businesses that have very high bandwidth requirements, particularly for data centre and data storage network applications.
- 4.192 In paragraphs 4.193 to 4.203 below ComReg considers the extent to which xWDM and other very high bandwidth retail LL services may represent an effective retail substitute for Ethernet based LLs and our preliminary conclusion is that they are.

²⁷⁹ See paragraph 4.180 above. All TI LL >2Mbs are TDM based.

²⁸⁰ See paragraphs 5.157 to 5.164.

²⁸¹ Oxera Report; Section 3.1.3.

Demand Side Substitution

Product Characteristics

- 4.193 xWDM equipment typically supports a wide range of service connection interfaces and protocols including Ethernet, SDH and other interfaces such as those associated with data storage applications, e.g. Fibre Channel²⁸². Therefore, the qualitative aspects of Ethernet and other very high bandwidth LL services such as xWDM are very similar. The introduction of very high bandwidth Ethernet services that are capable of delivering symmetric speeds of up to 100 Gb/s has further reduced the gap between maximum bandwidth that these LL services can deliver while xWDM systems can deliver multiple wavelengths on a single fibre.
- 4.194 The 2014 Market Research indicated that purchasers of very high bandwidth LLs (such as xWDM LLs) tended to value product attributes in a similar manner to purchasers of Ethernet based retail LLs. In particular, service availability, bandwidth, symmetry and contention were mentioned by the majority of respondents purchasing very high bandwidth LLs as important or very important service characteristics²⁸³.

Pricing

- 4.195 Retail pricing information on xWDM is difficult to ascertain with any degree of certainty and/or reliability due to the factors outlined in paragraphs 3.47 to 3.49 above. However, as detailed in Section 5²⁸⁴ Eircom's wholesale price of its 10 Gb/s WSEA logical circuit is likely to be priced in a manner to compete with xWDM interfaces.²⁸⁵

Intended Use

- 4.196 Table 4 above indicates that high bandwidth MI LL are used in a similar way to other LL services with 90% of purchasers using their service for accessing emails and internet, 67% for data services such as cloud computing and 59% for connectivity between business premises. As noted in paragraph 4.191 above, some end-users such as data centres require specialist high bandwidth applications for connecting storage area networks. In such instances, these end-users typically purchase xWDM or other high bandwidth LL products. Hence, the intended use of xWDM is similar to that of high speed Ethernet retail LLs.

²⁸² <https://www.perle.com/products/sfp-to-sfp-media-converter.shtml>.

²⁸³ The 2014 Market Research, slide 88. For example, 93% of respondents purchasing very high bandwidth LL noted that bandwidth is important or very important service characteristic compared to % of Ethernet LL users.

²⁸⁴ See paragraph 5.102 below.

²⁸⁵ Eircom LLRO Network Price List V6.8.

Substitution

4.197 Figure 6 above illustrated that there are relatively few xWDM or other very high bandwidth MI LL sold at the retail level. At the end of 2015 there were 273 such LLs up from 199 in 2014 and 161 in 2013.²⁸⁶ However, for the purchasers of very high bandwidth Ethernet LLs (e.g. 10 Gb/s Ethernet LL) xWDM or other very high bandwidth LLs that offer similar speeds are likely to be perceived as a viable substitute.²⁸⁷

4.198 Furthermore, as the demand for higher bandwidth services increases into the future, the substitutability of xWDM and similar very high bandwidth products with high bandwidth Ethernet services will likely converge.

SPs' views on substitutability between very high bandwidth LL services such as xWDM and other LL services

4.199 In general, respondents were of view that there is a partial substitution between Ethernet and other very high bandwidth LL services such as xWDM. BT noted that:

BT
[REDACTED]
[REDACTED]²⁸⁸

4.200 None of the SPs who responded to the Qualitative Questionnaire indicated that xWDM retail lines should not be considered as a substitute for Ethernet based retail LLs.

Supply Side Substitution

4.201 ComReg notes that all SPs providing very high bandwidth MI LL services such as xWDM are also supplying Ethernet services. Thus, any competitive constraint that may arise from providers of xWDM and other very high bandwidth retail LL services is already considered in the demand side substitution analysis above.

²⁸⁶ See Figure 6 above.

²⁸⁷ There is also a substantial number of international circuits delivered into data centres. These high bandwidth circuits are either directly connected to customer equipment in the data centre or connected to privately owned retail networks which are therefore, treated as international circuits and are excluded from our circuit count.

²⁸⁸ Response to Qualitative Questionnaire; June 2015.

Preliminary Conclusions on xWDM and other very high bandwidth LL services

- 4.202 Having considered relevant demand side factors including functionality, pricing and consumer usage, as well as relevant supply side factors, ComReg's preliminary view is that xWDM and other very high bandwidth LL services are in the same relevant retail product market as Ethernet LL. ComReg also notes that the inclusion, or otherwise, of xWDM and other very high bandwidth MI LL services in the retail MI LL market is not likely to impact upon ComReg's assessment of competition in the WHQA market (given the relatively small take-up of these services at the retail level).
- 4.203 Very high bandwidth LL such as xWDM and Ethernet LL over 1 Gb/s have sufficiently similar product characteristics and are used in a similar way by end-users. The introduction of very high bandwidth Ethernet services that are capable of delivering symmetric speeds of up to 100 Gb/s has further reduced the differences between Ethernet and other very high bandwidth LL such as xWDM.

Overall preliminary conclusion on likely retail LL product markets

- 4.204 As noted in paragraph 4.1 above, ComReg is not required to conclude on the precise scope of the retail market, but has carried out this analysis in order to inform the subsequent analysis of the WHQA market(s). ComReg has focused on the extent to which different retail LL services can be considered to be effective substitutes for other retail LL, broadband and dark fibre services. The evaluation of substitutability has included the consideration of product and functional characteristics, pricing, and customer usage as well as relevant supply side considerations.
- 4.205 ComReg's preliminary conclusions on its assessment of the retail markets can be summarised as follows:
- (a) Low Bandwidth Traditional Interface ('TI') Retail Product Market consisting of all retail leased lines carried over analogue, digital and TDM interfaces with speed of ≤ 2 Mb/s²⁸⁹, (the '**Low Bandwidth ('LB') TI Retail Product Market**');
 - (b) High Bandwidth TI Retail Product Market which consists of all wholesale leased lines provided over a TDM interface with speeds > 2 Mb/s (the '**High Bandwidth ('HB') TI Retail Product Market**'); and

²⁸⁹ ComReg's preliminary view is that there is a break in the chain of substitution between TI LL services at 2Mb/s. Retail TI LLs > 2 Mb/s are therefore considered to fall within a separate market to those ≤ 2 Mb/s.

- (c) Modern Interface ('MI') Retail Product Market consisting of all wholesale leased lines carried over modern technology interfaces such as Ethernet, EFM xWDM and other such high bandwidth interfaces such as FDDI²⁹⁰ and FICON²⁹¹ (the '**MI Retail Product Market**');
- 4.206 The above product markets (together referred to as the '**Relevant Retail Product Markets**') do not distinguish between the different types of media (wireless, fibre, copper) used to provide retail LLs. i.e., they are transmission medium neutral.
- 4.207 Asymmetric business broadband is not considered a substitute for a retail LL due to the likely lack of effective supply and demand side substitutability between the products. Although a certain cohort of end-users may consider business broadband a substitute, it is not sufficient to act as a significant competitive constraint on the retail (or wholesale) LL markets.
- 4.208 Furthermore, passive infrastructure, such as Dark Fibre, is not considered to be an effective substitute for a retail LL due to the investment and expertise needed to provide retail LL using such passive infrastructure.²⁹²

Geographic Assessment of Retail LL markets

Overview

- 4.209 In this section ComReg assesses the potential geographic scope of the Relevant Retail Product Markets identified and summarised at paragraph 4.205 above.
- 4.210 As was the case with the assessment of the retail product markets, ComReg is not required to define the geographic boundaries of these markets. However, it is nevertheless useful to examine their likely geographic scope, since it is likely to be of relevance to the consideration of the geographic scope of the upstream wholesale markets. Furthermore, indirect constraints might arise in these markets having regard to the strength of competition occurring in certain geographic areas at the retail level. ComReg's approach follows the approach adopted by the European Commission in the 2014 Recommendation.²⁹³
- 4.211 As such, ComReg considers whether there are likely to be geographical differences in the conditions of retail LL competition. In summary;
- (a) ComReg does not consider there to be sufficient differences in the conditions of competition in relation to the provision of TI based retail LLs in the State to warrant the delineation of a separate geographic market;

²⁹⁰ Fibre Distributed Data Interface.

²⁹¹ Fibre Connection.

²⁹² Again, while some large sophisticated end-users may have the requisite skills and technology to utilise Dark Fibre, they are insufficient in number to warrant being considered an effective substitute.

²⁹³ See Section 5; Page 52 of the 2014 Recommendation

- (b) Although ComReg acknowledges that there are some differences in the conditions of competition in the Retail MI Product Market, these are insufficient to warrant the designation of separate geographic markets; and
- (c) Therefore the geographic scope of the Relevant Retail Product Markets is considered to be national in scope.

4.212 This section considers the following:

- (a) the framework for the assessment of geographic markets (discussed in paragraphs 4.213 to 4.216);
- (b) assessment of the geographic scope of the Relevant Retail Product Markets (discussed in paragraphs 4.217 to 4.236); and
- (c) ComReg's overall preliminary conclusions on the geographic scope of the Relevant Retail Product Markets (discussed in paragraph 4.237 to 4.238).

Framework for assessing retail geographic markets

4.213 In general, the process of defining the geographic boundaries of markets involves identifying any geographic areas where a distinct break in competitive conditions can be observed. This approach places weight on the underlying structural and behavioural factors that are relevant in determining the competitiveness of a market.

4.214 The European Commission's Notice on Market Definition stated that the relevant geographic market is:

*"...an area in which the undertakings concerned are involved in the supply and demand of the relevant products or services, in which area the conditions of competition are similar or sufficiently homogeneous and which can be distinguished from neighbouring areas in which the prevailing conditions of competition are appreciably different."*²⁹⁴

4.215 The European Commission notes in its SMP Guidelines that:

²⁹⁴ European Commission Notice on Market Definition, paragraph 8.

“According to established case-law, the relevant geographic market comprises an area in which the undertakings concerned are involved in the supply and demand of the relevant products or services, in which area the conditions of competition are similar or sufficiently homogeneous and which can be distinguished from neighbouring areas in which the prevailing conditions of competition are appreciably different. The definition of the geographic market does not require the conditions of competition between traders or providers of services to be perfectly homogeneous. It is sufficient that they are similar or sufficiently homogeneous, and accordingly, only those areas in which the conditions of competition are ‘heterogeneous’ may not be considered to constitute a uniform market. In general, the process of defining the geographic boundaries of markets involves identifying any geographic areas where a distinct break in competitive conditions can be observed. This approach places weight on the underlying structural and behavioural factors that are relevant in determining the competitiveness of a market.”²⁹⁵

4.216 This initial assessment is not intended as an SMP assessment, which is addressed later in this Consultation, but as an overview of the geographic features of the retail market, which may require further assessment when defining geographic market boundaries at the wholesale level.

Assessment of the Geographic Scope of the Relevant Retail Product Markets

4.217 Below, ComReg assesses the geographic features of the retail market by having regard to the following issues:

- (a) geographic variation in entry conditions;
- (b) the evolution of operators market shares; and
- (c) geographic variances in products and pricing.

Geographic variation in entry conditions and the availability of services

4.218 Prior to ascertaining the likely geographic scope of the and Relevant Retail Product Markets, the following sections considers some of the main issues in relation to the roll out of networks by SPs

4.219 In order to provide retail LL services at a given location, an SP must either:

- (a) purchase wholesale access to another SPs network; and/or
- (b) build a network that is capable of offering the service.

²⁹⁵ European Commission SMP Guidelines, paragraph 56.

- 4.220 Entry will only likely occur at a given location when an SP expects it to be profitable within a reasonable timeframe (i.e. the revenue associated with providing services to a customer, or a particular group of customers, at that location is greater than the costs associated with servicing those customers).
- 4.221 In the context of option (a) above, namely wholesale access being used to facilitate the offering of retail LLs, SPs can compete at the retail level through the purchase of wholesale LLs supplied by a number of other SPs, as indicated in Table 1 above²⁹⁶.
- 4.222 ComReg notes that due to the imposition of existing access (and other) obligations on Eircom (pursuant to the 2008 Decision), SPs without their own network can provide retail LLs by virtue of having access to regulated wholesale LL products. Although, it should be noted, that absent regulation, it is likely that Eircom's wholesale LL services would not likely be made available by Eircom to SPs (either at all or on the same terms and conditions).²⁹⁷
- 4.223 Option (b) above is where an SP to builds an electronic communications network. This involves significant levels of upfront capital investment which may be sunk.²⁹⁸ For this reason, entry through own network deployment tends to be focussed - at least in the first instance - around areas where SPs can achieve greater economies of scale, scope and density and thereby increasing the possibility of recovering their network investment costs from a greater number of business customers within a given area. This type of network roll-out has, based on the evidence available, trended to centre on the roll out of fibre cable or P2P radio links – higher capacity media that can carry more traffic than a copper network.

²⁹⁶ See paragraph 3.3 above.

²⁹⁷ In the absence of SMP, and in circumstances where Eircom is also competing against the Access Seeker at the wholesale and/or retail level, it has the ability and incentive to deny access.

²⁹⁸ A cost that has already been incurred and cannot be recovered.

- 4.224 In practice, this type of entry has predominantly arisen through SPs rolling out their networks in business parks²⁹⁹ and data centres³⁰⁰, but also in campuses of Higher Education Providers (together referred to as '**Business Parks**³⁰¹') where there is more likely to be concentrated demand for MI LL services³⁰². Digiweb and Airspeed, as noted in paragraph 3.19, have their own national networks of radio high sites, but purchase wholesale LLs and use their own P2P radio links - for providing network backhaul from many of their regional PoPs. Also, Airspeed, in combination with Enet can leverage their combined fixed and wireless assets to provide competitive offerings in both the retail and wholesale LL markets.
- 4.225 Moreover, as noted in paragraphs 3.23 to 3.24 above, a significant development in the evolution of electronic communications infrastructure in Ireland is the publicly funded urban MANs operated by enet which provide an alternative network in 94 urban locations in Ireland, many of which are connected by enet's own independent backhaul network. Wholesale access to the individual MAN networks is mandated with price ceilings.³⁰³
- 4.226 Between the network of MANs and the availability of P2P radio links, ComReg is of the opinion that there is likely to be alternative wholesale access available for the provision of retail LLs in large geographic areas of the State – principally for the delivery of MI based retail LLs.

Geographic variances in products and pricing

- 4.227 ComReg has examined the pricing and commercial behaviour of the current suppliers of retail LLs. The existence of uniform pricing across Ireland, or otherwise, could provide a useful indicator of any differences in competition across different geographic areas of the market.

²⁹⁹ Business parks are sites that contain clusters of typically commercial businesses. They tend to be located in suburban areas and near to main roads. As these tend to group similar types of end-user demand (i.e. corporate or IT specific firms) in one location, the costs for operators connecting to these sites are lower compared to areas where end-user premises are more dispersed.

³⁰⁰ Data centres, in the broadest sense, are premises whose main purpose is to house computing and communications equipment in secure locations and which therefore require very high capacity LL as well as dark fibre to carry data to and from their facilities.

³⁰¹ See Appendix: 5 for a list of Business Parks.

³⁰² For example, see the coverage of SPs networks in Appendix: 11 below.

³⁰³ See <http://www.enet.ie/wholesale-pricing.html> for details.

- 4.228 As part of the geographic market assessment, ComReg asked SPs currently supplying LL services in Ireland as to whether they differentiate their LL services functionality and or pricing/marketing on a geographic basis³⁰⁴. All SPs indicated in their responses that they did not differentiate the prices or functionality of their retail LL services on a geographic basis. Respondents also noted that price of identical retail LL services can vary in areas where they do not have their own network. In these areas, the retail price will likely depend on the costs of wholesale inputs used to provide retail services.
- 4.229 While there appears to be some differentiation between LL services purchased in urban business parks and data centres, these variances appear to primarily relate to required service bandwidth. However, ComReg does not discount that these price differentials may be the result of differences in the intensity of competition. In contrast, functionality and product characteristics of actual retail LL services are uniform across the State having regard to the relevant network infrastructure in place.

Geographic distribution of market shares

TI Retail Product Markets

- 4.230 With some exceptions³⁰⁵, TI based retail LLs are mainly provided by Eircom over its ubiquitous copper network. SPs can in theory, provide retail TI LLs through the use of LLU from Eircom, but this has not been done by SP to date and is unlikely to be done in future as the market is in decline.
- 4.231 In relation to the retail market, Eircom and BT have a combined market share of $\%[\text{redacted}]$ ($\%[\text{redacted}]$ and $\%[\text{redacted}]$ respectively). As such, ComReg is of the preliminary opinion that due to Eircom's national ubiquitous copper network, the geographic scope of the TI retail markets are National in scope.

MI Retail Product Market

- 4.232 In contrast to the Retail TI Product Markets, there are multiple transmission media capable of supporting MI interfaces including, fibre, HFC and P2P radio.³⁰⁶

³⁰⁴ ComReg Qualitative Questionnaire; June 2015.

³⁰⁵ Such as higher bandwidth TDM which can utilise fibre and a trivial amount on wireless technologies.

³⁰⁶ ComReg also acknowledges that copper can support some low speed MI services such as EFM and low bandwidth Ethernet, however the volumes of such LLs is low.

- 4.233 SPs that utilise these media have concentrated their network roll out in geographic areas where demand is likely to be highest. The presence of alternative networks has increased particularly in areas of high business activity, such as Business Parks. In these areas civil engineering infrastructure such as duct networks may be more accessible and demand for retail LL services is more concentrated. This potentially indicates that there may be certain geographic areas within which the barriers for entering and/or expanding in the MI retail market may be lower. As part of the market definition assessment of the WHQA markets in Section 5³⁰⁷, ComReg has undertaken a detailed analysis to ascertain whether there are differences in the conditions of competition between different areas based on differences in the condition of supply.
- 4.234 This analysis shows that although geographic market share distributions of SPs differ inside and outside of the business parks, such observed differences are not of such a magnitude such that it suggests that the conditions of competition are appreciably different inside/outside of Business Parks.³⁰⁸
- 4.235 As can be seen from Figure 28 below, certain SPs have greater market shares in these different areas but not to the extent that it suggests that the conditions of competition are sufficiently different to warrant the delineation of separate geographic markets.

SP views on the variation of competitive conditions within the State

- 4.236 In general, SPs were of the view that the intensity of retail competition is greater in business parks within the major urban centres such as Dublin, Cork, Galway and Limerick, as well as in data centre locations. Alternative SPs own network presence was cited as the primary driver for greater retail competition in these areas.³⁰⁹

Preliminary conclusion on retail geographic market

- 4.237 In paragraphs 4.209 to 4.236 above ComReg has considered the geographic features of the Relevant Retail Product Markets in order to inform the subsequent analysis of the WHQA markets. ComReg's assessment indicates that:
- (a) there is no apparent evidence of retail TI LL or MI LL service functionality or price/marketing differentiation on a geographic basis;
 - (b) both TI LLs and MI LL retail services are offered by several SPs on a nationwide basis; and

³⁰⁷ See paragraphs 5.189 to 5.237 below.

³⁰⁸ Some SPs concentrate their supply in these areas, others outside the Business Parks.

³⁰⁹ 11 of 12 respondents to the Qualitative Questionnaire stated this to be the case.

- (c) some differences in competitive conditions can be observed within Ireland with respect to MI LLs, in particular, the presence of SPs on-net infrastructure is higher in urban Business Parks and Data Centres, thus potentially indicating a potential greater intensity of competition in the supply retail MI LL services in these areas. However, the observed differences in the number of competitors and market shares are not sufficient in and of themselves to identify clear and stable sub-national geographic boundaries.

4.238 ComReg considers that the Relevant Retail Product Markets are likely to be national in scope.

Overall Preliminary Conclusion on Retail Market Assessment

4.239 Having regard to the analysis above, ComReg's preliminary conclusions on its assessment of the retail markets can be summarised as follows:

- (a) Low Bandwidth Traditional Interface ('TI') Retail Market consisting of all retail leased lines carried over analogue, digital and TDM interfaces with bandwidths of $\leq 2\text{Mb/s}$, with this market being national in its geographic scope (the '**Low Bandwidth ('LB') TI Retail Market**');
- (b) High Bandwidth TI Retail Market which consists of all wholesale leased lines provided over a TDM interface with bandwidths $> 2\text{Mb/s}$, with this market being national in its geographic scope (the '**High Bandwidth ('HB') TI Retail Market**'); and
- (c) Modern Interface ('MI') Retail Market consisting of all retail leased lines carried over modern technology interfaces such as Ethernet, EFM, xWDM and other high bandwidth interfaces, with this market being national in its geographic scope (the '**MI Retail Market**');

4.240 The above product markets (together referred to as the '**Relevant Retail Markets**') do not distinguish between the different types of media (wireless, fibre, copper) used to provide retail LLs. i.e., it is transmission media neutral.

4.241 Asymmetric business broadband is not considered a substitute for a retail LL due to the likely lack of effective supply and demand side substitutability between the products. Although a certain cohort of end-users may consider business broadband a substitute, it is not sufficient to act a competitive constraint on the retail (or wholesale) LL markets.

4.242 Furthermore, passive infrastructure, such as Dark Fibre, is not considered to be an effective substitute for a retail LL due to the investment and expertise needed to provide retail LL using such passive infrastructure.

Question 2: Do you agree with ComReg’s assessment of the retail LL markets? Please explain the reasons for your answer, clearly indicating the relevant paragraph numbers to which your comments refer, along with all relevant factual/empirical evidence supporting your views.

5. Definition of the Relevant WHQA Markets

Overview

- 5.1 In this Section, ComReg sets out its preliminary view on the definition of the relevant WHQA markets.
- 5.2 To this end, ComReg has identified three wholesale markets which are closely related to the Relevant Retail Markets, one for MI WHQA (**'MI WHQA Market'**) and two separate TI WHQA markets. In the latter case, ComReg is of the preliminary view that there is bandwidth break in the TI WHQA market at 2 Mb/s, with wholesale LLs above this speed being in a separate market to those at or below this speed. These TI WHQA markets are referred to as the **Low Bandwidth ('LB') TI WHQA Market** and the **High Bandwidth ('HB') TI WHQA Market**.
- 5.3 Furthermore, ComReg is of the view that these three markets are national in scope. In doing so, ComReg conducted an in-depth analysis of the geographic scope of the MI WHQA Market to ascertain if there were heterogeneous conditions of competition in certain areas, namely around Business Parks and other such clusters of high demand for LLs (both retail and wholesale). Although ComReg did find some variances in these areas vis-à-vis the rest of the State, these differences were not sufficient to warrant the identification of separate geographic markets.³¹⁰
- 5.4 ComReg's preliminary view is, therefore, that the WHQA markets are as follows:
- (a) a Low Bandwidth Traditional Interface (**'TI'**) WHQA Market consisting of all wholesale leased lines carried over analogue, digital and TDM interfaces with speed of ≤ 2 Mb/s, with this market being national in its geographic scope (the **'Low Bandwidth ('LB') TI WHQA Market'**);
 - (b) a High Bandwidth TI WHQA Market which consists of all wholesale leased lines provided over a TDM interface with speeds > 2 Mb/s, with this market being national in its geographic scope (the **'High Bandwidth ('HB') TI WHQA Market'**); and
 - (c) a Modern Interface (**'MI'**) WHQA Market consisting of all wholesale leased lines carried over modern technology interfaces such as Ethernet, EFM, xWDM and other such high bandwidth interfaces such as FDDI and FICON, with this market being national in its geographic scope (the **'MI WHQA Market'**).

³¹⁰ This exercise was complemented by a similar exercise using a different methodology by Oxera. See Section 8.2 of the Oxera Report.

- 5.5 The above product markets (together referred to as the ‘**Relevant WHQA Markets**’) do not distinguish between the different types of media (wireless, fibre, copper) used to provide WHQA LLs; i.e., it is transmission media neutral.
- 5.6 Asymmetric wholesale broadband access is not considered a substitute for a WHQA due to the likely lack of effective supply and demand side substitutability between the products. Likewise, passive infrastructure such as Dark Fibre is not considered to be part of any of the Relevant WHQA Markets for the same reasons³¹¹.
- 5.7 The Section discusses and assesses the following;
- (a) the regulatory and legal framework for market definition (discussed in paragraphs 5.8 to paragraphs 5.14);
 - (b) the WHQA product market definitions (discussed in paragraphs 5.15 to 5.188);
 - (c) the geographic scope of the relevant WHQA markets (discussed in paragraphs 5.189 to 5.237); and
 - (d) ComReg's overall preliminary conclusions on the definition of the Relevant WHQA Markets (discussed in 5.238 to 5.242).

Regulatory Framework for the definition of Wholesale Markets

- 5.8 As noted in Section 1 above³¹², the European Commission has established that the WHQA market is susceptible to *ex ante* regulation and, in doing so, refers to the WHQA market as:

*“Wholesale high-quality access provided at a fixed location”*³¹³

- 5.9 The European Commission’s Notice on Market Definition defines a relevant market as follows:³¹⁴

³¹¹ However, dark fibre and other passive infrastructure inputs (including, as noted below, LLU) can be used in the provision of downstream LL services.

³¹² See paragraph paragraph 1.27 above.

³¹³ Explanatory Note accompanying the Commission Recommendation on relevant product and service markets within the electronic communications sector susceptible to *ex ante* regulation, dated 9.10.2014 (the ‘Explanatory Note to the 2014 Recommendation’), at page 42. The Explanatory Note to the 2014 Recommendation is available at <https://ec.europa.eu/digital-single-market/en/news/explanatory-note-accompanying-commission-recommendation-relevant-product-and-service-markets>.

³¹⁴ Commission Notice on the definition of relevant market for the purposes of Community competition law Official Journal C 372 , 09/12/1997 P. 0005 – 0013.

- (a) a relevant product market comprises all those products and/or services which are regarded as interchangeable or substitutable by the consumer by reason of the products' characteristics, their prices and their intended use; and
 - (b) a relevant geographic market comprises the area in which the firms concerned are involved in the supply of products or services and in which the conditions of competition are sufficiently homogeneous.
- 5.10 The European Commission's SMP Guidelines state that;
- Market definition is not a mechanical or abstract process but requires an analysis of any available evidence of past market behaviour and an overall understanding of the mechanics of a given sector. In particular, a dynamic rather than a static approach is required when carrying out a prospective, or forward-looking, market analysis.*³¹⁵
- 5.11 In defining the relevant WHQA markets, ComReg begins by identifying the appropriate wholesale focal product. From here, ComReg examines whether this focal product is in a market of its own, or whether a broader market should be defined to take into account direct supply-side or demand-side substitutes. ComReg then assesses the degree, if any, to which indirect constraints arising from downstream retail markets might effectively constrain behaviour in the relevant WHQA Market. Finally there is an assessment of the geographic scope of the relevant WHQA product market identified.
- 5.12 In line with the MGF Approach³¹⁶, ComReg's assessment starts from the assumption that regulation is not present in the market under consideration. However, regulation present in other related markets, or through other aspects of the regulatory framework, is assumed to be present. This is to avoid drawing conclusions regarding the competitive structure of a particular market which may be influenced by, or indeed premised on, existing regulation on that market. Considering how a relevant WHQA market may function absent regulation helps to ensure that regulation is only applied (or withdrawn) in those circumstances where it is truly justified and proportionate.
- 5.13 As noted in the SMP Guidelines, market definition is not an end in itself, but is undertaken to provide the context for the subsequent competition/SMP analysis.³¹⁷ It allows ComReg to consider the competitive constraints imposed by demand and supply side substitutes (and consequently the buyers and suppliers of those substitute products/services) on a forward-looking basis, taking into account expected or foreseeable technological or economic developments over a reasonable time horizon linked to this market review³¹⁸.

³¹⁵ Paragraph 35 of the SMP Guidelines.

³¹⁶ See paragraph 1.31 above.

³¹⁷ See paragraph 34 of the SMP Guidelines.

³¹⁸ See recital 27 of the Framework Directive, which is transposed into Irish law by the Framework Regulations.

- 5.14 The remainder of this section addresses the product and geographic market assessment within which the following issues are considered.

Relevant WHQA Product Market Assessment Overview

- 5.15 As set out in Sections 3 and 4, WHQA is predominantly used to provide downstream retail LL services, with such LLs also being used by SPs for network completion purposes, where appropriate. As such, ComReg takes the retail markets identified in Section 4 as the starting point for the wholesale assessment and definition of relevant markets.
- 5.16 In assessing the scope of the relevant product markets, ComReg has identified two broad wholesale product markets, a TI WHQA market consisting of Analogue and Digital LLs along with PPC's carried over a TDM interface and a separate MI WHQA market consisting of wholesale LLs provided over Ethernet and other high speed interfaces such as xWDM.
- 5.17 Furthermore, ComReg is of the preliminary view there is a break in the chain of substitution for TI WHQA LLs at 2 Mb/s, with circuits of supporting speeds above this bandwidth being in a separate product market. Consequently, the WHQA market is divided into a LB TI WHQA and a HB TI WHQA market.
- 5.18 In considering the relevant WHQA product market assessment, ComReg considers the following issues:
- (a) how SPs wholesale LL supply to their own retail functions, referred to as self-supply, should be treated (discussed in paragraphs 5.20 to 5.24);
 - (b) what the focal product should be, being the product against which alternative potential substitutes will be assessed (discussed in paragraphs 5.25 to 5.31);
 - (c) an assessment of the TI WHQA product markets (discussed in paragraph 5.33 to 5.146);
 - (d) an assessment of the MI WHQA product market (discussed in paragraphs 5.147 to 5.182);
 - (e) an assessment of the MI WHQA geographic market (discussed in paragraphs 5.189 to 5.206); and
 - (f) (an assessment of the TI WHQA geographic markets discussed in paragraphs 5.207 to 5.237); and
 - (g) ComReg's overall preliminary conclusions on the relevant markets (discussed in paragraphs 5.238 to 5.242).
- 5.19 The above issues are considered below.

Treatment of self-supply

- 5.20 Prior to beginning the WHQA product market assessment, ComReg sets out how it intends to treat the self-supply of SPs in the relevant WHQA markets. In summary, ComReg treats self-supply of SPs' wholesale LLs to its retail businesses as being part of the WHQA market due to the fact that such supply is typically readily divertible to the wholesale merchant market.
- 5.21 There are, however, exceptions to this. Self-supply by SPs to their own mobile arms are not considered to be part of the relevant WHQA markets as there is no feasible scenario in which the mobile arms of the SPs would purchase these services from another SP (i.e. its internal sales are captive).
- 5.22 In this respect, the Explanatory Note to the 2014 Recommendation states³¹⁹:

“The issue of how to take into account the self-provision of wholesale inputs arises frequently in both defining and analysing wholesale markets. In some cases, what is under consideration is the self-supply of the incumbent operators. In others, it is the self-supply of alternative operators.

In many cases the incumbent is the only undertaking that is in a position to provide a potential wholesale service. It is likely that there is no merchant market as this is often not in the interest of the incumbent operator. Where there is no merchant market and where there is consumer harm at retail level, it is justifiable to construct a notional market when potential demand exists. Here the implicit self-supply of this input by the incumbent to itself should be taken into account.

In cases where there is likely demand substitution, i.e. where wholesale customers are interested in procuring from alternative operators, it may be justified to take the self-supply concerned into consideration for the sake of market delineation. Even where there is an alternative potential supplier, it may share the same strategic interests as the incumbent regarding supply to third parties, to discourage market entry. Alternative operators' self-supply should, in particular, be assessed when alternative operators' networks are included in the relevant market due to the strong direct pricing constraints they exert on the incumbent operator. However, this is not justified if alternative operators face capacity constraints, or their networks lack the ubiquity within the relevant geographic market expected by access seekers, and/or if alternative providers have difficulty in entering the merchant market readily.”

³¹⁹ See page 18 of the Explanatory Note to the 2014 Recommendation.

- 5.23 Eircom provides WHQA to its own retail divisions (self-supply), as well as to third party SPs (external merchant market supply) using its copper and fibre network inputs. For the purpose of this market definition exercise, ComReg considers that Eircom's self-supply of WHQA falls within the market regardless of whether it is used to supply other LL SPs, or by Eircom to its own retail arm (save for the exceptions noted in paragraph 5.21 above). Eircom's existing WHQA products are available on a national basis and are purchased by a number of SPs³²⁰. Its self-supply to its retail arm could be converted relatively easily to external merchant market supply in the short term without incurring significant additional costs. Similarly, ComReg considers that the retail self-supply of other SPs active in the merchant wholesale market should also fall within the relevant WHQA markets³²¹.
- 5.24 In relation to Eircom's supply of WHQA products to its mobile arm Eircom Group Mobile³²² and its joint venture subsidiary Tetra³²³, ComReg considers that such supply is likely to be captive³²⁴. ComReg notes that in the event of a price change in the WHQA market, Eircom is unlikely to stop supplying its own internal demand. Eircom's subsidiaries are also unlikely to purchase WHQA products from alternative SPs irrespective of the price (typically an internal transfer charge) charged for these products by the upstream arm.³²⁵ Thus, ComReg is of preliminary view that Eircom's self-supply to its mobile arm and to Tetra is outside the scope of the relevant WHQA product market as such supply is unlikely to be converted to external merchant market supply. Similarly, other MNOs' internal supply of leased line connectivity to their own downstream mobile operations is excluded from the relevant WHQA product market as such supply is also considered to be captive.

³²⁰ See paragraphs 3.3 to 3.26 above for information on SPs selling and purchasing WHQA products.

³²¹ As noted on page 14 of the Oxera Report there is significant presence of alternative infrastructure in areas of high demand for LL (e.g. Business Parks). This indicates that owners of alternative infrastructure have spare capacity which can easily be converted to external merchant market supply.

³²² Eircom Group Mobile covers Meteor and Eircom Mobile brands.

³²³ See www.tetraireland.ie.

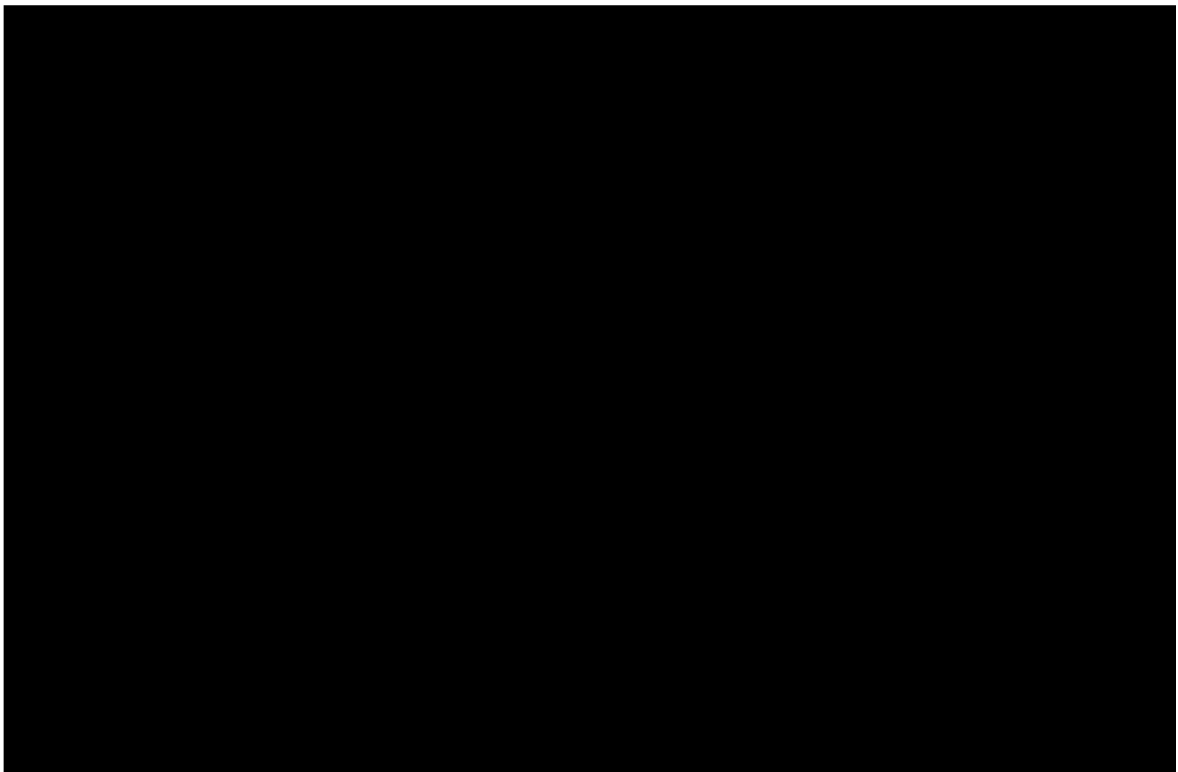
³²⁴ The inclusion of captive sales into the relevant market may depend on whether the internal traffic would be made available in the merchant sales in case of an increase or decrease of market prices (*i.e.* whether the captive sales would be sufficiently quickly switched to the merchant market in response to a change in the competitive conditions).

³²⁵ Save for circumstances where Eircom cannot supply it themselves.

Identifying the Focal Product

5.25 The first step in defining the relevant WHQA product market involves identifying the relevant focal product. As highlighted in Figure 20 below, Eircom is the largest supplier of WHQA LL products to third parties via its TDM, NGN and xWDM networks with an overall general³²⁶ market share of \approx [REDACTED]³²⁷. Thus, ComReg considers that Eircom's WHQA LL products are likely to represent a suitable starting point for the product market definition exercise.

Figure 20: General WHQA market shares in presence of regulation
 \approx [REDACTED]³²⁸



Note: Market Share data is based on wholesale LL sales information, in presence of regulation in the general WHQA LL market (i.e. for all WHQA LLs). Figures include only wholesale On-Net products based on SPs' own network inputs i.e. circuits re-sold at the wholesale level (off-net circuits) are not included in the analysis. **Count Method 2 (single ended physical circuits³²⁹)**.

³²⁶ Across **all** wholesale LLs rather than in the sense of any defined market.

³²⁷ Less than 50%.

³²⁸ Market shares in this figure are calculated based on the supply of WHQA using own network inputs only. In other words, resold wholesale LL are not included in WHQA market shares estimation. Based on information provided through the Statutory Information requests

³²⁹ See Appendix: 3 for a detailed description of methodologies adopted by ComReg in calculating market shares.

Eircom's WHQA Products

5.26 Eircom offers a wide range of WHQA TI LL and MI LL products, services and facilities in accordance with its existing SMP regulatory obligations. These products are detailed in its Leased Line Reference Offer ('LLRO') on Eircom's wholesale website³³⁰.

5.27 In summary, the WHQA LL products currently provided by Eircom include:

- (a) **End-to-end services:** these link two end-user sites, where either end could be a business consumer end-user or SP network site. These are comprised of local access connections either directly connected at the same local serving node or exchange or two geographically separated local ends connected across the core network of a SP. These can also consist solely of core capacity in the circumstances where both ends are network nodes connected with high bandwidth services. Thus an end-to-end leased line can range in scale from an analogue line connecting two business premises to a multiple 100 Gb/s service connecting data centres or network nodes. The demand for end-to-end WHQA products has been low in recent years as the majority of Access Seekers are now purchasing Partial Private Circuit ('PPC') based interconnection products (see below).
- (b) **Interconnection based or PPC type LL terminating segments:** these segments most commonly link an end-user's premises to the network node of the SP purchasing the terminating segment, enabling the purchasing SP to assemble an end-to-end LL service using a combination of wholesale LL inputs and its own network. Terminating segments can also be used to link together nodes in the purchasing SP's network. Terminating segments consist of access and any (necessary) backhaul segments (and associated facilities) as discussed below:
 - (i) *Access segments:* these are typically the final network circuit connecting an end-user's premise to a local access node - for example - on Eircom's network this might be in a Local Exchange.
 - (ii) *Backhaul segments:* these are connections running from a local access node back to the purchasing SPs own core network (or between exchanges). Backhaul segments often make greater use of shared infrastructure, including physical sharing of such infrastructure.

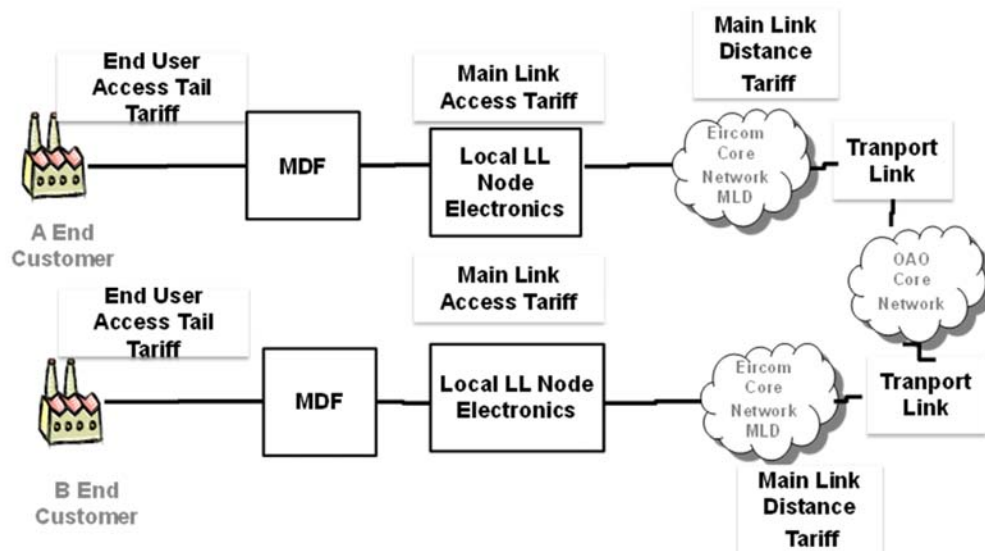
5.28 A Typical TDM PPC product is illustrated in the stylised Figure 21 below. A PPC from an Access Seeker³³¹ to an end customer has three segments:

³³⁰ Available at http://www.openeir.ie/Reference_Offers/.

³³¹ Access Seekers are referred to throughout this consultation as those undertakings that purchase, or could potentially purchase, WHQA services.

- (a) **Access segment** – End-user link is a dedicated link between the third party customer premise and Eircom LE generally using Eircom’s copper or fibre access network. End-user links’ prices vary by bandwidth. Additional charges exist for distances beyond a certain length (1.5 km for circuits less than or equal to 2Mb/s, 0.5km for circuits above 2 Mb/s). Pricing also varies by handover type (e.g. in-building handover or customer site handover). Additional charges for diversity can also apply.
- (b) **Core segment** – Main link provides dedicated transmission capacity between Eircom’s Local Exchange and the Access Seeker’s POP with Eircom’s network. There are two tariffs associated with this component:
- A Main link access tariff is a charge for accessing the TDM core network from the access link. Prices vary by bandwidth and also depend on whether traffic is local (same node) or to a different exchange or handover point.
 - Main link distance tariff is a charge that applies for traffic conveyance across the core network. There are fixed and variable (distance) based charges at each bandwidth interval.
- (c) **Interconnection segment** – Transport Link is the physical interconnection to the Access Seeker at the point of interconnect. There are fixed and variable (distance) based charges at each bandwidth. Charges for different types of handover (in-span, in building, customer site) also apply.

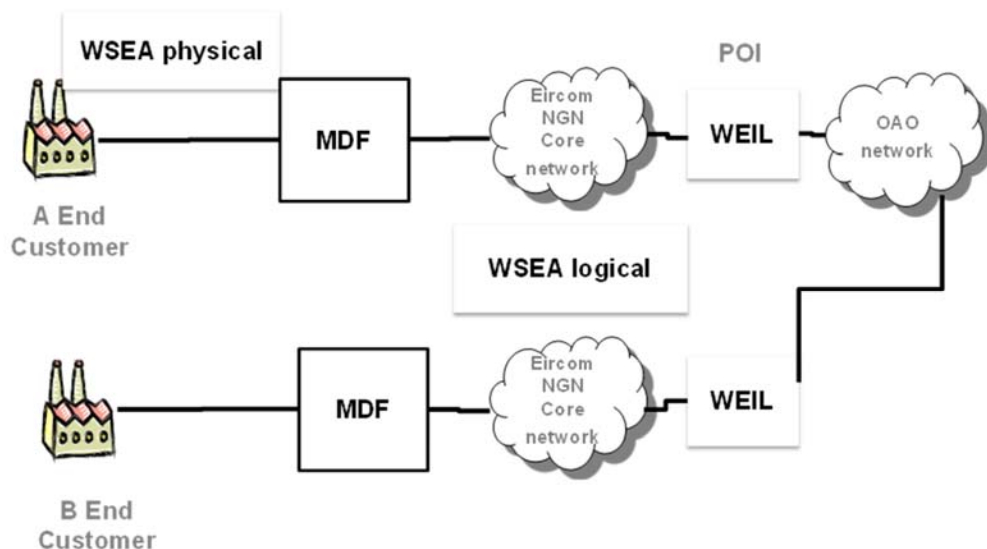
Figure 21: Eircom’s PPC Product



5.29 Eircom’s Ethernet product is stylised in Figure 22 below and it also has access, core and interconnection segments, although it is structured differently. The relevant segments are:

- (a) Wholesale Symmetrical Ethernet access ('WSEA') – is the physical fibre link and port extending from the third party customer premise to Eircom's NGN Local Exchange. Prices vary by capacity (1Gb/s or 10Gb/s), distance and the density (urban, provincial or rural) of the area;
- (b) WSEA logical - is the configuration of the conveyance across the NGN core network. Prices vary by bandwidth, class-of-service, and whether conveyance is local, within the same region or to another region.
- (c) Wholesale Ethernet Interconnection Link ('WEIL') - is the interconnection link between Access Seeker and Eircom at a central interconnection point. Prices vary by capacity (1 Gb/s or 10 Gb/s), by area density of the WEIL link, and by the type of handover - i.e. whether the connection to Eircom is in the Access Seeker's site (customer site handover) or within Eircom's exchange (in-building handover).³³²

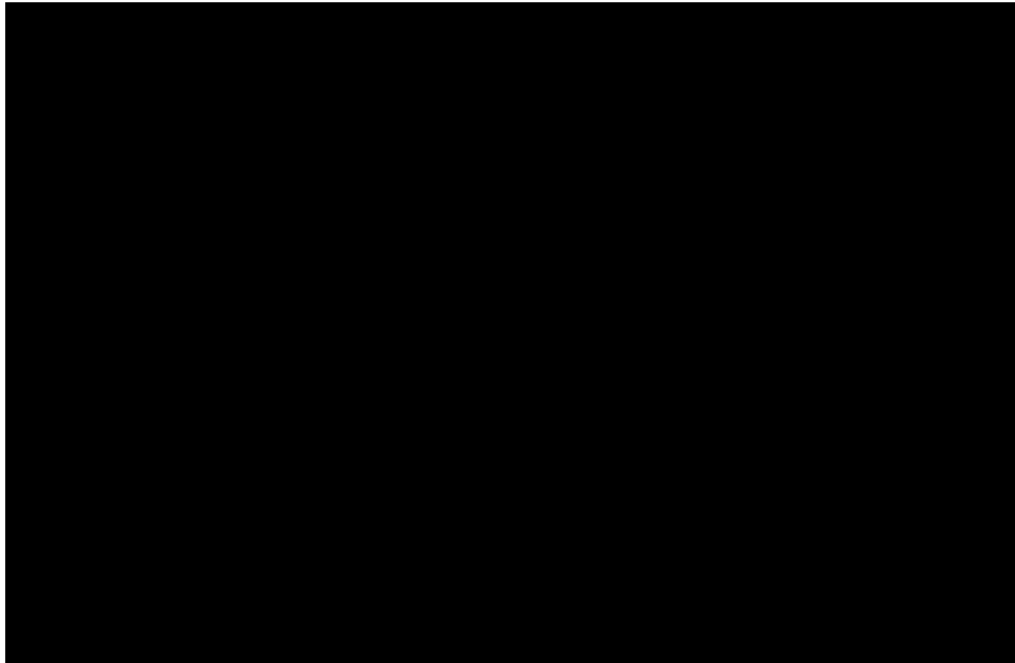
Figure 22: Eircom's Ethernet Product



5.30 Figure 23 below indicates that at the end of Q4 2015 the majority of Eircom's sales of WHQA LL products were Ethernet based LL \times [] circuits], followed by TI based LLs³³³ \times [] circuits and xWDM MI based LLs \times [] circuits). Consistent with the general trend of migration towards MI based LLs at a retail level, the number of TI based WHQA LLs is in decline as wholesale customers migrate to MI based WHQA LLs. Thus, in ComReg's preliminary view, Eircom's Ethernet WHQA LL products represent a suitable starting point for the product market definition exercise.

³³² An additional type of handover called Edge node handover is also possible. This requires greater investment from the Access Seeker in return for lower incremental costs of interconnection.

³³³ These mainly consist of TDM LLs.

Figure 23: Eircom's WHQA products by technology ✕[REDACTED]

Overall Preliminary View on the WHQA Focal Product

- 5.31 Since wholesale Ethernet LLs forms the majority of active demand for WHQA LL products, ComReg is of preliminary view that Ethernet wholesale LLs should form the focal product for the purpose of the WHQA product market assessment.
- 5.32 ComReg refers to LLs delivered over an Ethernet interface (and any effective substitutes) and 'Modern Interface' ('MI') WHQA LLs.

Product Market Assessment – MI WHQA LLs

- 5.33 Below ComReg considers the strength of any direct and indirect constraints present in the MI WHQA product market(s) with a view to considering whether the MI WHQA product market should be broadened to include other potentially effective substitute products. In particular, ComReg considers potential:
- (a) Demand-side substitution (discussed in paragraphs 5.38 to 5.110); and
 - (b) Supply-side substitution, including the self-supply of vertically integrated service providers (discussed in paragraphs 5.111 to 5.126).
- 5.34 ComReg's overall preliminary conclusions on the assessment of the above direct constraints are set out in paragraphs 5.127 to 5.129.
- 5.35 ComReg then also considers the impact of indirect constraints in paragraphs 5.130 to 5.135 before then considering the delineation of the boundaries of the trunk-terminating markets in paragraphs 5.130 to 5.143.

- 5.36 ComReg sets out its overall preliminary conclusions on the MI WHQA product market in paragraphs 5.144 to 5.146.
- 5.37 ComReg's overall preliminary conclusion is that the MI WHQA Product Market is comprised of wholesale Ethernet, EFM, xWDM and other high capacity MI WHQA LLs. In the case of the MI WHQA Product Market, Eircom's self-supply is included in the as well as WHQA products provided over alternative networks (both physical and wireless networks). Self-supply of alternative network owners is also included in the WHQA Product Markets where such SPs are supplying MI WHQA products to Access Seekers.

Demand-Side Substitution – MI WHQA LLs

- 5.38 As outlined in Section 4 above³³⁴, analysis of customer behaviour in response to price increases is a useful framework by which to define the relevant product market.
- 5.39 The demand-side substitution analysis is undertaken from the perspective of the Access Seeker and assesses their response to a SSNIP in the price of WHQA. If a sufficient number of Access Seekers switch to an alternative WHQA product in response to a SSNIP in the price of the focal product (i.e. Ethernet interface wholesale LLs), hence rendering that price increase unprofitable, then the alternative WHQA product should be included in the relevant WHQA product market.

Do WHQA Ethernet LLs provided over alternative networks fall within the WHQA product market?

Product Characteristics and Pricing

- 5.40 Table 12 below illustrates that there are a number of SPs providing WHQA Ethernet based LLs including BT, enet, Colt and other suppliers. From a functional perspective ComReg considers that WHQA Ethernet products offered over alternative wired networks are likely to be sufficiently similar to WHQA Ethernet products offered by a HM to make them effective demand-side substitutes. This is because Ethernet LLs are delivered using the same technology over fibre (or in some cases copper) networks. Thus, in response to a SSNIP by a HM of Ethernet WHQA products, an Access Seeker could acquire WHQA Ethernet products provided over alternative SPs' wired networks.

³³⁴ See paragraph 4.116 above.

5.41 Information about wholesale prices of WHQA products provided over alternative wired networks is generally not publicly available as these products are sold on a PoA basis. However, ComReg considers that pricing of WHQA products provided over alternative wired networks are likely to be similar to the pricing of Eircom's Ethernet WHQA products as SPs of WHQA services are actively competing against each other. Pricing information submitted by some WHQA SPs, in response to ComReg's Qualitative Questionnaire also support this view.³³⁵

335 < [REDACTED]

Table 12: Access Seekers' demand for WHQA products ✕[REDACTED]

	Airspeed	BT	Colt	Digiweb	Eircom	enet	ESB	EU Networks	Host Ireland	Magnet	Three	Virgin Media	Verizon	Vodafone
Airspeed	✕ REDACTED													
AT&T														
BT														
Colt														
Digiweb														
Eircom														
enet														
ESB														
EU Networks														
Fulnett/Streamcom														
Host Ireland														
Magnet														
Three														
Virgin Media														
Verizon														
Vodafone														

Note: This table indicates which the relationship between Access Seekers and WHQA SPs. Access Seekers are displayed on the vertical access while SP suppliers of Ethernet WHQA products are displayed on horizontal axis. Green colour indicates that Access Seeker is purchasing products from a given WHQA SP. White colour indicates that Access Seeker is not purchasing products from a given WHQA SP. Black colour indicates instances where the relationship is not applicable.

Intended use

- 5.42 At the wholesale level, the demand for Ethernet WHQA LLs is primarily derived from an Access Seeker's demand for inputs used in the provision of retail LL services and for network completion/extension, where appropriate. As highlighted in Section 3 above, retail LL are often used for multiple purposes, including email and Internet, data services, connectivity between premises and VoIP services. ComReg considers that intended use of LL provided over Eircom's network at the retail level is similar to that of an Ethernet LL service provided over an alternative wired network as product characteristics and functionality are relatively similar.

Substitution

- 5.43 Substitution between WHQA providers largely occurs when SPs of retail LLs are preparing their tenders for end-users' bids. In general, changing WHQA supplier can involve switching costs such as the overhaul of Customer Premises Equipment ('CPE') and/or connecting to the SP's network. However, some of these costs may be lower at the time when contract renewal and installation of the LL service occurs. Thus, in areas where multiple competing infrastructure is available, Access Seekers that do not have their own infrastructure can purchase Ethernet WHQA LLs from several other SPs.
- 5.44 Furthermore, as noted in paragraph 5.219 to 5.224 below, there are numerous competing MI WHQA providers in most areas of the State and so it is ComReg's preliminary view that Access Seekers have the ability to purchase MI WHQA throughout the State from competing SPs.³³⁶
- 5.45 Table 12 above indicates that Access Seekers are typically purchasing WHQA Ethernet LL products from multiple SPs. It demonstrates that WHQA products provided over alternative wired infrastructure are likely to be considered by Access Seekers to be as effective demand side substitutes for Eircom's products. In this regard, ComReg notes that Eircom itself is also purchasing WHQA from other SPs including <[REDACTED]>.³³⁷

³³⁶ Through either competing wired MI WHQA providers or wireless MI WHQA SPs. See paragraphs 5.47 to 5.63 for more details on wireless MI WHQA.

³³⁷ Predominantly in relation to MI WHQA.

Conclusion on provision of Ethernet services over alternative wired infrastructure

- 5.46 ComReg is of the preliminary view that owners of alternative wired infrastructure such as BT, Colt, Digiweb, enet, EU Networks, Magnet, Virgin Media, Verizon and Vodafone offer Ethernet products that are likely to be substitutable for the identified focal product³³⁸. As noted in paragraph 5.23 above, self-supply of SPs providing WHQA is also considered to fall within the relevant WHQA product markets, where these SPs are also active in the merchant market.

Do WHQA Ethernet LL products provided over wireless networks fall within the WHQA product market?

- 5.47 In paragraphs 5.48 to 5.63 below ComReg considers whether WHQA Ethernet LLs provided over wireless networks are in the same market as WHQA Ethernet products delivered over wired networks. In the context of the retail market assessment in Section 4³³⁹, ComReg set out its preliminary view that retail LLs based on P2P wireless links are considered by retail end-users to be effective substitutes for Ethernet LLs provided over a wired medium.

Product Characteristics

- 5.48 The Oxera Report indicates³⁴⁰ that many of product characteristics of wireless and fixed Ethernet LLs are similar. Technological developments in wireless technologies mean that currently wireless LL can provide bandwidths of up to 1 Gb/s at short distances between wireless service end-points. Figure 24 below illustrates the marketing of ESBT's wireless Ethernet WHQA LL products. ESBT's wireless services are positioned as cost efficient WHQA product capable of delivering speeds of up to 300 Mb/s. Premium SLAs are also available for this product.
- 5.49 Given the similarity of product characteristics to wired Ethernet LL products, ComReg considers that from the perspective of majority LL users in Ireland³⁴¹, wireless LL are likely to be viewed as potential alternative to LL delivered over wired infrastructure. Since the demand for LL services is primarily derived from an Access Seeker's demand for inputs for the provision of retail LL services, similar considerations as that for retail LLs also apply at the wholesale level.

³³⁸ Please note that listed SPs are not intended as an exhaustive list of all active suppliers of wired LL in Ireland at present, but are rather included as examples of the principal suppliers.

³³⁹ See paragraphs 4.58 to 4.89 above.

³⁴⁰ Oxera Report; Chapter 5 and Figure A3.1.

³⁴¹ For example, as illustrated by Figure 10 above, retail LL delivering bandwidth equal to or above 1Gbps account for 12.5% of all Ethernet LLs.

Figure 24: ESBT's marketing of wireless LL product



Energy for generations

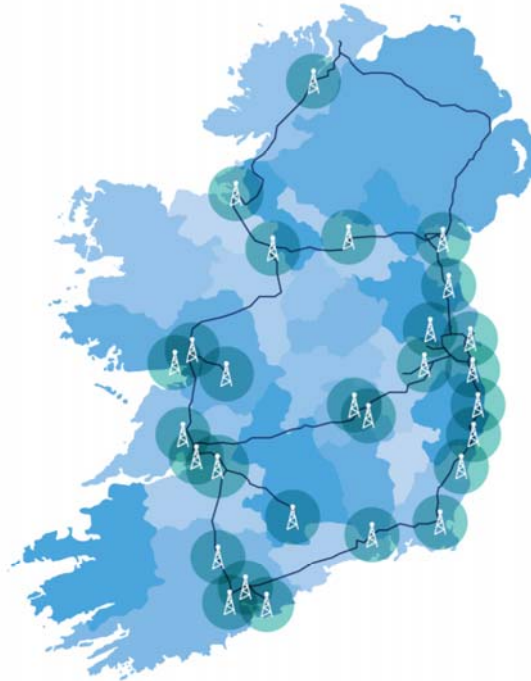
LICENCED MICROWAVE RADIO

ARE YOU LOOKING FOR HIGH SPEED CONNECTIVITY WITH END TO END PERFORMANCE IN MIND ?

At ESB Telecoms Ltd, we own and manage 400+ towers nationwide, we also operate an extensive fibre network.

We have combined these two infrastructures to offer an exciting new Microwave Radio Product providing significant national coverage.

This wireless radio product connects with ESBT's core fibre network at multiple sites around Ireland delivering high capacity and cost efficient solutions.



 OVER 400 TOWERS

— AN EXTENSIVE FIBRE NETWORK

FIBRE ENABLED
ESB TELECOMS
LTD. TOWERS



LINE OF SIGHT
TO CUSTOMER
BUILDING

NEUTRAL
DATACENTRE

WHAT WILL YOU GET?

All wireless solutions are **individually designed** to meet your requirements and each radio link operates over a **Comreg approved licenced frequency** dedicated to you.

- ✓ Scalable bandwidth (up to 300mb available)
- ✓ Quick Deployment
- ✓ Dedicated Account Manager
- ✓ Premium SLA available
- ✓ Full end to end secure and reliable solution
- ✓ Line of Sight (LOS) survey
- ✓ Full wireless network design
- ✓ Radio licence application
- ✓ Professional installation
- ✓ Supply, commissioning and customer acceptance testing

- 5.50 Therefore, as noted in paragraph 4.71 above, the main differences between wireless and wired LL services stems from the fact that operation of wireless LL must be licenced by ComReg in order gain access to the radio spectrum and direct line-of-sight between wireless service end-points is also required for the type of services aimed at businesses demanding retail LL services.
- 5.51 Furthermore, as described in paragraphs 4.65 to 4.68 above in some spectrum bands congestion can also be a factor in assessing substitutability between wireless based WHQA, and that provided over wired media. Congestion can arise because, the same frequency³⁴² cannot be used by two links in the same geographic area. Thus, in areas with relatively dense populations acquiring spectrum bands suitable for the deployment of P2P radio links can - in some instances - be difficult³⁴³.
- 5.52 While these factors have led NRAs in other countries (e.g. the UK and France) to conclude that wireless services are not sufficiently effective substitutes for fibre or copper based WHQA products, ComReg is of preliminary view that in Ireland environmental and demographic factors such as the relatively low population density and topography conducive to establishing high sights for the provision of WHQA via P2P radio links, have, to a large extent, ameliorated the issues related to LoS, spectrum scarcity and congestion.
- 5.53 Furthermore, ComReg notes that the potential for adding additional bands to the radio link licensing regime has been identified in ComReg's Radio Spectrum Management Strategy for 2016-2018, with this further increasing the capacity for the deployment of P2P radio links.³⁴⁴
- 5.54 ComReg's preliminary view is also supported by evidence presented in paragraphs 4.69 to 4.73 where it is noted that HEAnet (one of the largest purchasers of retail LLs in Ireland) has not experienced any issues with performance of P2P radio links.

Pricing

- 5.55 Information about wholesale prices of LLs products provided over wireless networks is generally not publicly available as these products are sold on a PoA basis. However, ComReg considers that pricing of Wholesale LL products provided over wireless networks is likely to be broadly similar to pricing of WHQA provided over wired media as SPs of wireless WHQA products are also actively competing at the wholesale level.

³⁴² Other than using horizontal and vertical polarisation, thus spectrum is still a limited resource.

³⁴³ In this regard, ComReg notes the closure of the 13 GHz and 15 GHz spectrum bands to new radio link applications in the congested area covering certain parts of Greater Dublin. See "[13 GHz and 15 GHz Frequency Bands within Dublin. Suspension of the Acceptance of new Fixed Link Applications in certain areas. ComReg Document 14/32](#)", dated 17 April 2014.

³⁴⁴ See "[Radio Spectrum Management Strategy 2016 to 2018. ComReg Document 16/50.](#)" dated 21 June 2016.

5.56 In this regard, ComReg refers to paragraph 4.77 above where it was noted that, at a retail level, bids from wireless LL SPs were competitively priced relative to bids submitted by SPs of wired LLs.

Intended Use

5.57 The end-user analysis presented in the Oxera Report³⁴⁵ finds that, at the retail level, SPs providing wireless LLs are competing for the same customers as providers of wired LLs. As the product characteristics of wired and wireless products are relatively similar, ComReg considers that intended use of LLs provided over wireless networks is likely to be sufficiently similar to that of a LL service provided over wired networks.

5.58 However, as noted in paragraph 4.87 some end-users might consider wireless LLs to be complementary to wired LLs. In such instances wireless LLs are used as a backup for resiliency and redundancy purposes because they do not depend on the same fibre infrastructure as wired LLs.

5.59 The Oxera Report³⁴⁶ indicates that at the wholesale level MNOs are large consumers of both wireless and wired WHQA. The Oxera Report notes³⁴⁷ that these links are generally used for 2G, 3G or 4G mobile backhaul, connecting dispersed base stations to a central switching and interconnection facility. As MNOs tend to require national coverage, wireless WHQA products may be preferred in remote locations where wired infrastructure is not available³⁴⁸ and traffic load on backhaul networks is lower compared to more densely populated areas.

5.60 This does not mean however, that wired LL products are always a preferred solution for MNOs in areas where both types of products are available. Evidence presented in the Oxera Report³⁴⁹ indicates that MNOs still rely heavily on wireless links to transport calls and data back to central locations even though the coverage of wired infrastructure has increased significantly over the last number of years.

³⁴⁵ Oxera Report, Section 5.3.

³⁴⁶ Oxera Report, Section A3.2.

³⁴⁷ Oxera Report; Section 5.3.2.

³⁴⁸ Or may not be considered economic to deploy.

³⁴⁹ See Table A3.3 in the Oxera Report where trends in P2P licences acquired by MNOs are presented.

Substitution

- 5.61 ComReg notes that switching costs would also exist when switching to wireless WHQA products. For example, Access Seekers purchasing wireless LLs would have to deploy microwave antennas at end-user premises. However, as noted in paragraph 5.43, these costs are likely to be lower at the time when installation of new LL service occurs. Table 12 indicates that suppliers of wholesale wireless LL such as Airspeed and Digiweb have contracts with several Access Seekers which would suggest that wireless WHQA products are considered to be an effective demand side substitutes for wired WHQA products.
- 5.62 As illustrated in Figure 8 above the demand for wireless LL at the retail level has grown over the last number of years which in turn have resulted in increased demand for wireless WHQA products. Wireless WHQA are available on a national basis and, as noted in paragraph 4.72, above there is no discernible geographic differences between urban and rural areas in terms of the success of wireless LL bids vis-à-vis wired bids at a retail level. ComReg also notes ESBT's recent launch of wireless WHQA product suite³⁵⁰ which will further increase the availability of wireless WHQA.

Preliminary Conclusions on whether Ethernet LL products provided over wireless networks fall within the WHQA product market

- 5.63 The evidence presented in paragraphs 5.48 to 5.62 above suggests that WHQA Ethernet products provided over wireless networks are likely to fall within the relevant WHQA product market(s) as wired Ethernet WHQA products. While there may be technical differences such as LoS requirements for wireless LL, these differences do not appear to be a limiting factor in wireless deployment for LL services in Ireland. ComReg notes that a significant portion of demand for LL services with bandwidth of up to 300Mb/s could be served by wireless LLs, on a national basis. Hence, ComReg's preliminary view is that products provided over wireless infrastructure are part of the relevant WHQA product market(s). Subject to the requirements set out in paragraphs 5.20 to 5.24 above, self-supply of these wireless WHQA SPs is also considered to fall within the relevant WHQA product markets.

Do wholesale broadband products fall within the same market as wholesale LLs?

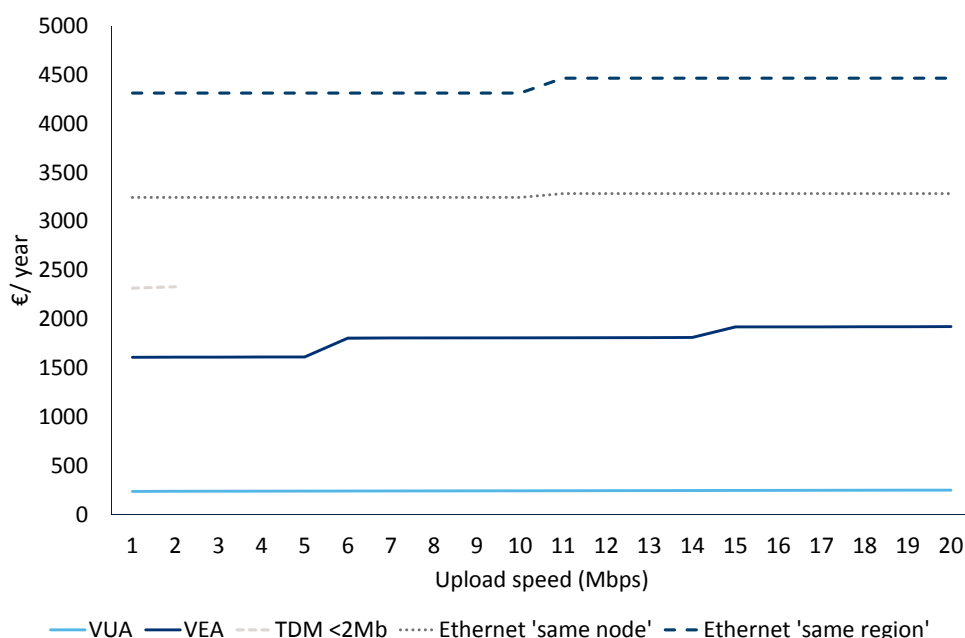
- 5.64 In Section 4 above ComReg set out its preliminary view that, with the exception of EFM products, broadband services are not likely to be a sufficiently effective substitutes for either retail TI based LLs or MI based LLs as there are significant differences in terms of product characteristics, pricing as well as intended use of these services by end-users.³⁵¹

³⁵⁰ See the information on the marketing of these products in Figure 24 above.

³⁵¹ See paragraphs 4.9 to 4.57 above.

- 5.65 ComReg considers that these differences equally apply at the wholesale level. For example, Oxera's analysis of Eircom's WHQA and wholesale broadband products set out in Figure 25 below illustrates that there are differences in the price as well as the use of these services. However, such price differences have not resulted in migrations from LL to broadband products at the retail level, even with increased availability of higher bandwidth broadband services³⁵².
- 5.66 While ComReg notes that Eircom's recently launched VDSL Ethernet Access ('**VEA**') service³⁵³ provides higher service levels (e.g. separate VPN per connection) compared to other Bitstream or VULA services, it cannot match all of service characteristics supported by LL products such as bandwidth guarantee (irrespective of local access distance) and service availability. Such differences in product characteristics are likely to be reflected in the existing price gap between VEA and LL products.

Figure 25: Comparison of wholesale broadband and LL services



Source: Oxera analysis of Eircom's wholesale leased line and broadband products' pricing. See Figure 6.1 of the Oxera Report.

- 5.67 On the basis of analysis presented in Section 4 and paragraphs 5.64 to 5.66 above, ComReg is of preliminary view is that wholesale broadband products do not fall within the market as WHQA LLs delivered over wired and wireless Ethernet LLs.

³⁵² Figure 14 above illustrates modest growth in business FTTC, FTTH and Cable broadband subscriptions over the relevant period.

³⁵³ VEA offers Ethernet services over an NGA connection to allow Access Seekers to access a customer premise from Eircom's regional Aggregation Nodes in a similar fashion to Bitstream services though with an individual VPN per connection. This service has not as yet gained significant volumes.

5.68 In relation to EFM services, as noted in paragraph 4.57 above, these services are likely to be considered by end-users as a sufficiently close substitute to Ethernet LLs. EFM service exhibits characteristics that are similar to characteristics of retail LLs as well as from the end-user perspective. Magnet and Digiweb are providing EFM services at the wholesale level and therefore EFM is likely to be a part of the relevant WHQA market (where these products are available).

Do dark fibre products fall within the same WHQA market as wholesale Ethernet and EFM LLs?

5.69 In Section 4 above ComReg set out its preliminary view that dark fibre services are unlikely to be an effective substitute for either a retail TI LL or a MI LL.³⁵⁴

5.70 The Oxera Report indicates³⁵⁵ that there are substantial fixed costs associated with using dark fibre to provide an active LL product as an Access Seeker purchasing dark fibre service would need a network of switched electronic (e.g., Ethernet equipment) in locations appropriate for aggregating customer traffic. Additional ongoing costs of network operations (e.g. maintenance, fault monitoring and repair, vendor support) would also be associated with moving to an active product delivery.

5.71 ComReg notes that dark fibre is purchased by several SPs of retail LLs typically for providing backbone connectivity. However, for the year end 2015 the volume of dark fibre services sold at the wholesale level was in the low hundreds. Therefore, ComReg considers that it is unlikely that a sufficient number of wholesale LL purchasers would switch to dark fibre services in response to a SSNIP in Ethernet and EFM WHQA products.

Do TDM WHQA products fall within the same WHQA market as Ethernet and EFM wholesale LL?

5.72 As noted in paragraph 5.23 above, in addition to providing Ethernet interface Wholesale LL products, Eircom also provides TI (analogue and TDM) Wholesale products. In Section 4³⁵⁶ in the context of retail market assessment, ComReg set out its preliminary view that MI and TI LLs constitute separate retail product markets. Nevertheless, ComReg considers whether, in response to a SSNIP in Ethernet and EFM based WHQA LLs a sufficient number of purchasers of this product would be likely to switch to TDM based WHQA such that it would make the SSNIP in wholesale Ethernet and EFM LLs unprofitable.

³⁵⁴ See paragraphs 4.90 to 4.97.

³⁵⁵ Oxera Report, Chapter 7.

³⁵⁶ See paragraph 4.237 above.

Product Characteristics

- 5.73 As highlighted in Table 9 above, qualitative differences between Ethernet/EFM LLs and TDM LLs have largely eroded since the last market review. While Ethernet/EFM services cannot exactly match all of the characteristics of a TDM LL such as latency, jitter or synchronisation, these differences appear to be of minor importance to the majority of end-users.³⁵⁷
- 5.74 However, there are end-users for whom the time synchronisation and low latency of TDM LL is important and their equipment is configured for TDM interfaces. As noted in Section 4 utility operators such as CIE and the ESB use Low Bandwidth TDM LLs for remote monitoring of their networks. Such end-users could be using legacy applications that do not require high bandwidth LLs, but are not suited to Ethernet interfaces. Thus, in order to serve these retail customers, WHQA Access Seekers need to either purchase wholesale TDM WHQA products or else have the capability to offer them themselves.

Pricing

- 5.75 The existing price differential between wholesale Ethernet and TDM LLs was highlighted in Section 4 above.³⁵⁸ The analysis in the Oxera Report indicates³⁵⁹ that Eircom's wholesale TDM products are priced higher relative to the price of wholesale Ethernet services, thus indicating that a 5% to 10% price increase in the price of Ethernet wholesale LLs is unlikely to lead to a significant migration by purchasers from Ethernet to TDM based wholesale LLs.

Intended Use

- 5.76 In Section 4 above, ComReg noted that the 2014 Market Research indicated that purchasers of LLs at the retail level tend to have similar uses for TDM and Ethernet LLs. However, end-users that require higher bandwidths for data networking purposes tend to purchase Ethernet as opposed to TDM based LL.³⁶⁰

³⁵⁷ See paragraphs 3.27 to 3.31 above.

³⁵⁸ See paragraph 4.151.

³⁵⁹ Oxera Report, Section 3.1.3.

³⁶⁰ See paragraphs 4.152 to 4.155 above.

Substitution

- 5.77 Figure 23 above³⁶¹ indicates that demand for TDM WHQA LL products continues to decline with the majority of new orders accounted for by Ethernet WHQA LL products. While wholesale TI LLs are still being ordered by WHQA Access Seekers³⁶², the general migration to Ethernet and/or other MI based LL services at the retail level would also suggest that there is an asymmetric substitution between these services at the wholesale level in that there are significantly more WHQA seekers switching from TDM to Ethernet based LL than WHQA seekers switching from Ethernet to TDM based LL. As also earlier noted, the order flow for new TDM LLs was trivial in 2015 whereas the number of ceases in the same period was greater.
- 5.78 Switching costs noted in paragraph 4.161 above would also be likely to limit the substitutability between WHQA TDM and Ethernet LL products as Access Seekers would have to overhaul CPE (although these costs may be more easily overcome at the time when contract renewal and installation of new LL service occurs).

Supply side Substitution

- 5.79 In relation to supply side substitution, changing from Ethernet to TDM supply is also likely to require significant upfront investment³⁶³. ComReg is not aware of any SP that is planning to begin providing TDM LL services over the lifetime of this market review. This is likely to be due to the fact that the demand for such services at both the wholesale and retail level is in decline. Thus, the supply side substitution between Ethernet/EFM and TDM WHQA products is also likely to be limited. ComReg understands that TDM equipment is approaching obsolescence and is no longer supported by equipment manufacturers.³⁶⁴ As such, any investment in switching to supply TDM based LLs is likely to be stranded, thereby also undermining the likelihood of supply side substitution.

Overall Preliminary Conclusion on whether TDM WHQA LLs fall within the same product market as Ethernet/EFM WHQA LLs

- 5.80 ComReg's preliminary view is that Wholesale TDM products are not likely to be sufficiently effective substitutes for Ethernet and EFM based WHQA LLs. While a comparison of service characteristics, end-user applications and service attribute importance is similar across TDM and Ethernet services, a number of factors outlined in paragraphs 5.73 to 5.79 suggest that these services are not effective substitutes at the wholesale level.

³⁶¹ See paragraph 5.30 above.

³⁶² Eircom had ☒ new wholesale TI LL orders in 2015.

³⁶³ Oxera Report, Section 3.1.4.

³⁶⁴ BT U.K. published a product update regarding its retail 'BT Global Services Private Circuits Product Line' 26 March 2015 in which is stated that it will cease selling Analogue and TDM lines <2Mbs at 1st September 2016 and will withdraw service entirely at March 2020.

5.81 We consider in paragraphs 5.147 to 5.182 below whether TDM LLs constitutes a separate product market in and of itself or whether a broader product market definition is warranted.

Do xWDM and other very high bandwidth WHQA products fall within the same WHQA market as Ethernet and EFM WHQA LLs?

5.82 ComReg considers below whether LLs provided over xDWM and other high bandwidth technologies are an effective substitute for Ethernet and EFM LLs. In paragraphs 5.72 to 5.81 ComReg set out its preliminary view that TDM based WHQA LLs did not fall within the same product market as WHQA LLs provided over Ethernet, EFM and xDWM WHQA LLs.

5.83 In relation to xWDM and other high bandwidth interfaced LL services, ComReg notes that at the retail level these services were considered to be effective substitutes for Ethernet LLs due to similarity of product characteristics, pricing and the intended use of these services³⁶⁵.

5.84 ComReg is of the preliminary view that there is also likely to be effective substitutability between Ethernet and very high bandwidth WHQA LLs based on xDWM (and other) interfaces at the wholesale level. The introduction of 10 Gb/s wholesale Ethernet products³⁶⁶ has reduced the bandwidth gap between Ethernet very high bandwidth LL products. As the demand for higher bandwidth services increases in the future, the substitutability of xWDM (and similar very high bandwidth interfaced LL products) with high bandwidth Ethernet services will likely strengthen further. Moreover, as noted in Section 4 above, the inclusion, or otherwise, of xWDM and other very high bandwidth xWDM and other interface LL services in the same market as Ethernet and EFM services is not likely to impact upon ComReg's overall assessment of competition in the market (given the relatively small take-up³⁶⁷ of these services).

Overall preliminary conclusions on whether xWDM (and other high bandwidth interface) WHQA LLs are an effective substitute for Ethernet and EFM WHQA LLs

5.85 Taking the above into account, ComReg is of the preliminary view that xWDM (and other high bandwidth interface) WHQA LLs fall within the same market as Ethernet and EFM WHQA LLs.

5.86 ComReg refers to Ethernet, EFM and xDWM WHQA LLs collectively as Modern Interface ('MI') WHQA LLs.

³⁶⁵ See paragraphs 5.82 to 5.87 above.

³⁶⁶ See "[eircom Network Price List](#)", dated 25 January 2016.

³⁶⁷ At the end of 2015 there were 273 such LLs, up from 199 in 2014 and 161 in 2013.

- 5.87 ComReg considers below whether a ‘chain of substitution’ exists for all MI WHQA LL bandwidths. i.e., do all bandwidths for MI WHQA LLs fall within the same product market or is there a break in the chain of substitution whereby it is appropriate to delineate the MI WHQA product market according to certain bandwidths.

Chain of substitution analysis for MI WHQA LLs

Overview

- 5.88 This section sets out ComReg’s preliminary view on whether or not a chain of substitution exists for MI WHQA LLs of all bandwidths.
- 5.89 A chain of substitution³⁶⁸ refers to the substitutability between numbers of similar products, which could lead to each of these products being part of the same market. A chain of substitution implies that a product at one end of the chain can potentially exert an indirect constraint on a product at the other end of the chain.³⁶⁹
- 5.90 For example, if product B is a substitute for products A and C, while A and C may not be direct substitutes, they may be considered to be in the same product market since their respective pricing may be constrained by substitution to B.³⁷⁰
- 5.91 As such, it is possible that an increase in price of one of the products in the chain could lead to a rise in the demand for a product further up the chain, in which case the associated products would be considered part of the same market for the purposes of a competition assessment.
- 5.92 In this regard, the Explanatory Note to the 2014 Recommendation observes that *“both ends of the chain belong to the same market as they are both constrained by the same product(s)”*³⁷¹. where there is no common pricing constraint, a break in the chain of substitution exists and two separate markets may be identified.

³⁶⁸ The concept of a ‘chain of substitution’ is described in the EC Notice on Market Definition (paragraphs 56-58) and is further described in the UK Office of Fair Trading document “Market definition: Understanding competition law”, December 2004 at:

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/284423/oft403.pdf

³⁶⁹ Aproskie, J. and S. Lynch (2012) ‘The Chain of Substitution in Market Definition: Pitfalls in Application’ <http://www.compcom.co.za/wp-content/uploads/2014/09/Aproskie-and-Lynch-Chain-of-substitution-in-market-definition-Competition-Conference-2012.pdf>.

³⁷⁰ EC Notice on Market Definition.

³⁷¹ Page 50 of the Explanatory Note to the 2014 Recommendation.

5.93 In the context of MI WHQA LLs ComReg assesses whether a chain of substitution exists between MI WHQA LL products offered at various bandwidths which are sufficiently close (i.e. the next links in the chain), and thereby subject to a common pricing constraint. For example, products that are close to the ends of the “chain” such as 10 Mb/s and 1 Gb/s circuits may not be close substitutes for each other, but both may be seen as substitutable for a 100 Mb/s LL in terms of product characteristics, pricing and intended use. If they are sufficiently close substitutes for a 100 Mb/s LL, then there may be a complete chain of substitution, meaning that all three LL products are part of a single product market.

Assessment for MI WHQA LLs

5.94 ComReg’s preliminary view is that there is a continuous chain of substitution across the bandwidths supplied over MI WHQA LLs. This is due to sufficiently similar product characteristics, services, and pricing for comparable bandwidths across the MI WHQA LLs. The maximum available bandwidth of the underlying MI WHQA LL connection is related to the transmission media used and the equipment installed at the customer’s premises. At such bandwidths, end-users can choose between Ethernet, EFM, xWDM and other MI retail LL services.

5.96 The retail end-user analysis presented in Section 4 and in the Oxera Report³⁷² indicates that there is no clear distinction between end-user types or the intended use of purchased retail LL services when comparing purchasers of retail MI LLs across bandwidths. For example, Eircom’s retail customer base [REDACTED] appears to be sufficiently homogeneous, with several end-users purchasing circuits of both bandwidths for generic inter-site connectivity purposes. Thus, it appears that retail customers’ choice of products (or combinations thereof) will be affected by the relative prices of the products actually offered.

5.97 In this regard, ComReg notes that Oxera has also analysed wholesale pricing of Eircom’s wholesale Ethernet products. For Ethernet products, the pricing of relevant segments described in paragraph 5.29 was examined.

5.98 Similar to the analysis of TDM product pricing, Oxera constructs a range of scenarios to test for bandwidth breaks in Ethernet pricing. These include:

- (a) different bandwidth ranges;
- (b) WSEA physical distance;
- (c) WSEA area density (urban and rural);
- (d) terminating circuit destination (same node, same region and different region);
- (e) class of service type (circuit or traffic based); and

³⁷² Oxera Report, Section 3.3.

- (f) WSEA physical circuit and WEIL lengths³⁷³.
- 5.99 It is also important to note that Eircom's NGN Ethernet services can be configured in two distinct ways for handling class-of-service ('CoS'):
- (a) circuit-based CoS; and
 - (b) traffic-based CoS.
- 5.100 For circuit-based configurations, all of a customer's traffic is placed into one of three traffic management queues on Eircom's NGN core. A circuit mapped to the 'standard' queue will have its traffic placed in the same queue as all of Eircom's customer's standard traffic in the event of congestion.
- 5.101 Traffic-based CoS means that customer traffic entering the network is inspected for 'CoS marking' as indicated by the end-user. The NGN network will then place individual packets of traffic into a queue based on the type of marking it sees. This can be done at a fine level, such that voice, video and emails within one leased line circuit are all treated differently.
- 5.102 Oxera's analysis³⁷⁴ inspects pricing of both traffic and service based configurations. However, more weight is given to price analysis of circuits configured on a traffic CoS configuration given that the majority of sold NGN Ethernet circuits are based on this configuration.
- 5.103 The Circuit based CoS Ethernet LL pricing analysis³⁷⁵ suggests that, for Ethernet circuits terminating on:
- (a) **the same NGN node:** there is no significant break in prices across a range of product bandwidths from 10 Mb/s to 5 Gb/s. The pattern is the same for longer WSEA and WEIL distance specifications; and
 - (b) **different nodes (in particular, different classes of service) or regions:** a possible break in prices appears at around 1 Gb/s. Oxera notes that equipment cost differences between 1 Gb/s and 10 Gb/s cards could contribute to this difference.³⁷⁶

³⁷³ For detailed description of assumptions used for each scenario see the Oxera Report, Table 3.7, Table A2.1 and Table A2.2.

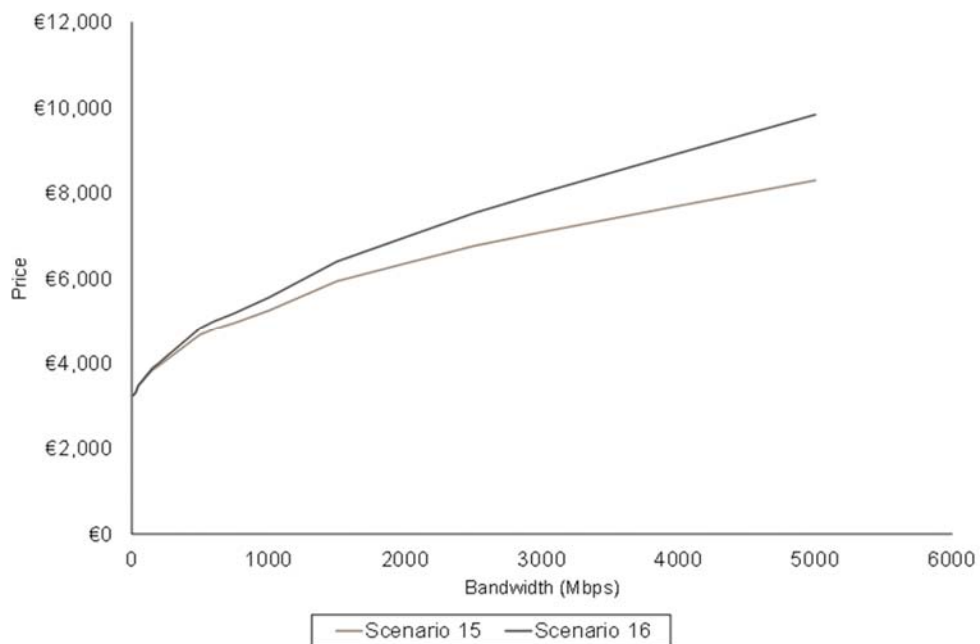
³⁷⁴ Oxera Report, Section 3.2.2.

³⁷⁵ Oxera Report, Section 3.2.2.

³⁷⁶ See eircom (2015), 'eircom Network Price List', reference offer, service schedule 13, v6.7, 30 June. A 1Gbs WEIL with customer site handover costs €2,100 per year while a 10Gbs connection costs €2,315 per year. Connection costs also differ: a 1Gbs in-span handover costs €1,450, while a similar connection at 10Gbs costs €3,950.

5.104 The Traffic based CoS Ethernet LL pricing analysis³⁷⁷ suggests that there is no apparent discontinuity in prices at a specific bandwidth. Altering circuit length, core conveyance (region) or class of service introduces a level shift, but does not shift relative pricing across bandwidths. For example, Figure 26 below compares traffic based CoS Ethernet prices for circuits terminating in the same node. It shows that prices are gradually increasing for higher bandwidth products. However, there is no significant step change in prices that would suggest a break in the Chain of Substitution across the available Ethernet bandwidths.

Figure 26: Ethernet bandwidth price analysis³⁷⁸



Source: Oxera analysis of Eircom wholesale leased line pricing.

³⁷⁷ Oxera Report, Section 3.2.2.

³⁷⁸ Oxera Report; Section A2.

- 5.105 From the suppliers' perspective, as noted in the Oxera Report³⁷⁹, Ethernet technologies are generally flexible in meeting the demands of different bandwidths. For example, Eircom's WSEA product tends to support a range of equipment physical interface specifications such as 10 Mb/s, 100 Mb/s and 1 Gb/s³⁸⁰. The Oxera Report also notes that providing a circuit with bandwidths between these speeds is determined by configuring a software rate limit on the equipment, rather than any explicit limit in the equipment or fibre link. Thus, the difference in costs associated with supplying services of particular bandwidths is not significant.³⁸¹
- 5.106 Market share distribution is also relatively homogenous when comparing market shares across Ethernet based WHQA LL product bandwidths up to 1Gb/s. Above this speed, market shares indicate that certain SPs are focussing on this part of the market.
- 5.107 Moreover, Eircom have recently added a 10 Gb/s WSEA product which indicates that Ethernet products can compete with xWDM based products in terms of bandwidth.³⁸²
- 5.108 This, suggests that conditions of competition in supplying Ethernet WHQA LL products at various bandwidths are sufficiently similar. Therefore, supply-side considerations also tend to point to there being no break in the Chain of Substitution across MI WHQA LL bandwidths.

³⁷⁹ Oxera Report, Section 3.3.3.

³⁸⁰ See eircom (2015), 'Technical Handbook Wholesale NGN Ethernet Products, product manual v 1.8, 5 June, p. 36.

³⁸¹ Oxera Report, Section 3.3.3.

³⁸² Eircom Network Price List Version 6.9.

Table 13: Market Shares by Bandwidth for Ethernet LLs ✂[REDACTED]

	Wholesale Ethernet ≤20 Mb/s	Wholesale Ethernet >20 Mb/s <100 Mb/s	Wholesale Ethernet 100 Mb/s	Wholesale Ethernet >100 Mb/s <1 Gb/s	Wholesale Ethernet 1 Gb/s	Wholesale Ethernet >1 Gb/s	xWDM and other
Airspeed	✂ REDACTED						
BT							
Colt							
Digiweb							
Eircom							
e-Net							
ESBT							
EU Networks							
Host Ireland							
Magnet							
Three							
Virgin Media							
Verizon							
Vodafone							

5.109 ComReg notes that the Oxera Report recommends³⁸³ identifying a separate market for Ethernet circuits with bandwidth below or equal to 2Mb/s as these are legacy connections which are declining in number. However, as ComReg’s approach is to include them all in the same market and, as the number of these circuits is relatively small³⁸⁴, the inclusion, or otherwise, of these services in the MI WHQA market is not likely to impact upon ComReg’s assessment of competition in this market.

³⁸³ Oxera Report, Section 3.4.4.

³⁸⁴ These circuits accounted for 4.9% of all retail Ethernet LLs and 3.6% of wholesale Ethernet LLs sold at the end of 2015.

Preliminary conclusions on Chain of Substitution Assessment for MI WHQA LLs

5.110 Having regard to the analysis in paragraphs 5.94 to 5.109 above, ComReg's preliminary view is that MI WHQA LL products of all bandwidths fall within the same WHQA product market.

Supply-Side Substitution – MI WHQA LLs

Overview

5.111 In this section ComReg sets out its preliminary views in relation to any impact of supply-side substitution in the MI WHQA market.

5.112 In the context of market definition, it should be considered if an alternative SP could provide an effective supply-side substitute to a MI WHQA LL. In particular, we consider whether a SP would be likely, in response to a SSNIP in MI WHQA LL prices (above the competitive level), to switch production into MI WHQA LLs in the immediate to short term (typically within one year) without incurring significant costs, and start supplying services of equivalent characteristics to the product and, as a consequence of such provision, render the HM's price increase unprofitable.

5.113 Therefore, in the event that limited demand-side substitution exists³⁸⁵, constraints could arise from potential competitors who may, in the future, through supply-side substitution, seek to provide WHQA either at the wholesale level to other SPs and/or self-supply as an input to the provision of their own downstream retail and/or wholesale services. This could, for example, include WHQA supplied by vertically-integrated alternative³⁸⁶ retail LL providers or suppliers of broadband services and suppliers of dark fibre services.

5.114 In carrying out this assessment, ComReg has considered SP responses to the Qualitative Questionnaires, in particular, views and evidence provided by SPs that indicate the strength of any direct constraint arising from supply-side substitution (including from vertically integrated SPs).



5.115 Below ComReg considers the potential for WHQA supply-side substitution by the following Service Providers (including the issue of self-supply where relevant):

- (a) Alternative SPs of retail LL services (discussed in paragraphs 5.116 to 5.119);
- (b) SPs of broadband services (discussed in paragraphs 5.120 to 5.123); and
- (c) SPs of dark fibre services (discussed in paragraphs 5.124 to 5.126).

³⁸⁵ However, given the number of alternative sources of supply in the MI market, it is the preliminary view of ComReg that sufficient demand side substitutes are present and will remain for the duration of this review.

³⁸⁶ We use the word 'alternative' in the sense that it refers to SPs other than Eircom.

Supply-side substitution (including self-supply) from alternative SPs of MI LL services

- 5.116 In paragraphs 5.38 to 5.110 ComReg assessed the effectiveness of demand-side constraints and set out the preliminary view that the MI WHQA product market included Ethernet, EFM and xWDM LLs provided over wired and wireless networks, with all bandwidths of such LLs included within the same product market.
- 5.117 In assessing the supply of such MI WHQA LLs over alternative networks, ComReg set out its preliminary view that given the extensive coverage of these networks, similarity of MI WHQA products' characteristics and pricing when compared to Eircom's MI WHQA products and the actual take up of these MI WHQA LL products, they are likely to impose sufficiently effective demand-side constraints on Eircom's MI WHQA LL products.
- 5.118 The remaining SPs considered in ComReg's analysis  and  do not own any infrastructure of their own and rely on MI WHQA LL products for the supply of their retail services. These SPs currently are not supplying MI WHQA services. Even if these SPs were to invest in infrastructure to provide MI WHQA services over the lifetime of this market review, it is not envisaged that the requisite own infrastructure would be put in place in sufficient time and with sufficient impact for them to be considered an effective supply-side constraint on a HM of MI WHQA LLs.
- 5.119 As such ComReg's preliminary view is that, in response to a SSNIP, alternative SPs that were not considered to provide effective demand-side constraints on Eircom are also unlikely to provide an effective direct supply-side constraint on MI WHQA LLs supplied by a HM. As such, ComReg's preliminary view is that notional supply-side substitution from alternative SPs of MI LL services should not be included in the MI WHQA LL product market.

Supply-side substitution (including self-supply) from SPs offering broadband services

- 5.120 Supply side substitution appears technically possible, in that an LLU operator which is not currently providing EFM-based Ethernet services (which are considered to fall within the MI WHQA LL product market) could begin to do so relatively quickly and easily.
- 5.121 However, ComReg notes that all but one of the Access Seekers either purchasing Eircom's LLU³⁸⁷ products or other SPs such as Virgin Media offering retail broadband over its own network (or a mixture of both) are already 'present' in the market by virtue of the fact that they already supply MI retail LLs and/or MI WHQA LLs.

³⁸⁷ BT, Digiweb, Magnet and Colt.

- 5.122 The remaining Access Seeker purchasing LLU products, 3PlayPlus, has a negligible presence³⁸⁸ at Eircom's exchanges and thus any potential MI WHQA LL products provided by such an SP are not considered likely to impose an effective supply-side constraint on a HM supplier of MI WHQA LLs.
- 5.123 For these reasons, ComReg's preliminary view is that, over the period of this market review, providers of broadband services, including their self-supply, that are not currently supplying MI WHQA LL services, are unlikely to provide an effective supply-side constraint on MI WHQA supplied by a HM, and should not therefore be included in the MI WHQA product market.

Supply-side substitution (including self-supply) from SPs of dark fibre services

- 5.124 As discussed above some of the SPs³⁸⁹ supplying dark fibre services are also active in the provision of retail and/or wholesale MI LL services. Thus, the competitive constraint arising from these SP is already accounted for in ComReg's analysis above.
- 5.125 In relation to dark fibre providers not active in the MI WHQA market such as ☒ [REDACTED], ComReg refers to the Oxera Report where it was noted³⁹⁰ that there are large fixed costs associated with entering the MI WHQA market as dark fibre provider would need a network of active electronic (e.g. Ethernet, xDWM equipment) in locations appropriate for aggregating customer traffic. Additional ongoing costs of network operations (such as maintenance, fault monitoring and repair) and other front and back office vendor support would also be associated with moving to an active product delivery. Even if dark fibre providers were to enter the WHQA Market in response to a SSNIP by the HM, such entry would be likely to involve significant time delays and incur significant cost.
- 5.126 For these reasons, ComReg considers that dark fibre SPs that are not currently supplying MI WHQA LL services are unlikely to provide an effective supply-side constraint on the provision of MI WHQA a the HM within the period of this market review.

³⁸⁸ 3PlayPlus has presence at ☒ exchanges and purchased ☒ fully unbundled LLU lines as of April 2016.

³⁸⁹ Digiweb, Eircom, EU Networks and Vodafone.

³⁹⁰ See Oxera Report; Chapter 7.

Summary of Overall Preliminary Conclusions on Direct Constraints – MI WHQA LLs

- 5.127 In paragraphs 5.33 to 5.126 above, ComReg has examined the potential for demand-side and supply-side constraints from providers of wired and wireless WHQA services, as well as substitution from dark fibre and wholesale broadband services, and whether these alternative products warrant inclusion in the relevant product market.
- 5.128 ComReg notes that there are several competing WHQA suppliers that are likely to provide a sufficiently immediate and effective competitive constraint on a HM's provision of WHQA. Thus, WHQA products supplied by these SPs are included in the WHQA markets. Dark fibre and broadband services, on the other hand, are not likely to exert a significant competitive constraint such that it would warrant their inclusion in the MI WHQA Market.
- 5.129 Furthermore, ComReg's provisional view is that the self-supply of MI WHQA by competing WHQA providers using alternative wired and/or wireless networks, would likely be effectively re-directed to supply in the WHQA Markets in response to a SSNIP of MI WHQA LLs, and therefore would assert an effective direct competitive constraint on the HM in the provision of WHQA.

Assessment of Indirect Constraints – MI WHQA LLs

- 5.130 Even in the absence of actual or potential direct constraints, a vertically-integrated alternative SPs' self-supply of retail LLs could be part of a relevant WHQA market if it is shown that its presence in related retail markets is able to exercise a sufficiently strong indirect pricing constraint on a HM's supply of WHQA products.

The Concept of Indirect Constraints

- 5.131 As set out by the OECD;

...a firm active in an upstream market may be directly constrained if other firms operate at that level. For example the ability of Firm A to raise prices above the competitive level for a wholesale input X used to provide retail services is constrained by the ability of firms B and C to switch wholesale input Y (substitute of X) supplied by firm B (demand substitution) or the ability of firm B to begin supply of wholesale input X (supply substitution). However, when inputs X and Y are not substitutes and firm B is unable to supply input X within a short term, firm A may still be indirectly constrained in imposing a price for input X as long as there is competition in the retail market between firms using X and Y inputs.³⁹¹

³⁹¹ Section 2.1.2; Defining the relevant market in telecommunications; OECD; 2014

5.132 In the context of MI WHQA LLs, indirect constraints could arise in a situation where a vertically integrated SP of retail LLs could constrain the profitability of a SSNIP by a HM supplier of MI WHQA LLs where sufficient customers were to switch to a this alternative SP providing retail MI LLs (who is not active in the wholesale market).

Relevance to MI WHQA Markets

5.133 The main distinction between a MI WHQA LL and a MI retail LL is that the former is sold to another SP and the latter is provided to an end-user who is not an SP.³⁹²

5.134 As such, if there was a situation whereby an SP was only active in the retail market and using its own network inputs to provide retail LLs then that supply could easily be diverted to a relevant WHQA market it could be considered to be a supply-side substitute and hence a direct constraint.

5.135 In any event, there are currently no retail LL SPs that utilise their own network inputs to provide those retail services who are not also active in the supply of MI WHQA LLs. Therefore, ComReg is of the preliminary view that that indirect constraints are not a relevant consideration in defining the relevant WHQA market as they have been already accounted for in the context of the assessment of direct constraints.³⁹³

Terminating-Trunk Boundaries of the MI WHQA product market

5.136 The trunk terminating boundary between networks delineates parts of a network that may face different competitive conditions of supply. In trunk networks, SPs may be able to aggregate traffic at relevant network points and so can exploit greater economies of scale, scope and density to overcome barriers to entry.³⁹⁴

5.137 In relation to WHQA, these trunk markets are adjacent to terminating segments of WHQA as SPs require both terminating and trunk segments to complete end-to-end connectivity.

5.138 Under the 2008 Decision, the trunk-terminating boundary of the then defined wholesale LL market is delineated by a bandwidth of greater than 155 Mb/s between certain urban centres, irrespective of the network topology and type; i.e., irrespective of whether it is based on LLs over a copper or fibre network.

³⁹² Recall that a Wholesale LL can be used to provide retail services and/or act as network inputs for an SP.

³⁹³ Furthermore, they are not considered relevant to the SMP assessment for similar reasons.

³⁹⁴ For example, SPs can use the trunk network to aggregate traffic for other services such as Broadband and Telephony.

“Circuits which are provided using established infrastructure, between certain urban centres ... and which are of a capacity equal to or greater than STM-1 (155Mb/s) fall into the market for trunk segments of wholesale leased lines. OAO investment on these routes reflects the difference in the underlying economic conditions of supply and demand.”³⁹⁵

5.139 Under the 2008 Decision, all such circuits are currently considered to be competitive and no SP is subject to *ex ante* SMP regulation.

5.140 In its 2014 Recommendation, the European Commission states, in relation to trunk LL markets that;

“...the presumption that trunk segments are replicable on a national scale remains valid. NRA’s should not revisit their analysis of trunk segments of leased lines where these have previously found to be competitive.”³⁹⁶

5.141 In Section 4 of the Oxera Report³⁹⁷ Oxera sets out in detail the issues to consider when delineating the trunk-terminating boundary in respect of this current market review. In summary, Oxera finds that there is likely to be a separate trunk markets for each of the TI WHQA LL and MI WHQA LL markets.

MI WHQA Market Trunk-Terminating Boundary Assessment

5.142 In relation to the MI WHQA market, Oxera considers that SPs are likely to be able to aggregate traffic between Eircom aggregation areas and as such, delineate the MI trunk - terminating boundary as traffic between aggregation areas. Consequently intra-regional traffic within an aggregation area is considered to be part of the terminating market.³⁹⁸

5.143 Notwithstanding the above, as set out in Section 6 below, ComReg is of the preliminary view that no SP has SMP in the MI WHQA Market, however its boundary is delineated. This is due, amongst other things, to the dispersion of market shares across a range of SPs, with no SP having a market share above 40% (with this being stable over time) and the relatively insignificant amount of MI LLs at both retail and wholesale that rely on the purchase of off-net inputs from any one particular SP.³⁹⁹ As such, the delineation of the MI trunk-terminating boundary does not materially alter the preliminary SMP findings outlined in Section 6.

³⁹⁵ Paragraph 5.7, 2008 Decision.

³⁹⁶ Section 4.2.2.3, 2014 Recommendation.

³⁹⁷ Chapter 4, Oxera Report.

³⁹⁸ Section 4.4, Oxera Report.

³⁹⁹ See Section 6 below.

Overall preliminary conclusions on the MI WHQA Product Market

5.144 In paragraphs 5.31 to 5.143 above ComReg has considered the definition of the relevant MI WHQA market from a product perspective and, in so doing has considered demand-side and supply-side constraints, as well as indirect constraints. ComReg's preliminary view is that the **MI WHQA Product Market** is comprised of:

- (a) Wholesale Ethernet LLs;
- (b) Wholesale EFM LL services; and
- (c) Wholesale xWDM and other high capacity MI WHQA LLs.

5.145 In the case of the MI WHQA Product Market, Eircom's self-supply is included in the market as well as WHQA products provided over alternative networks (both physical and wireless networks). Self-supply of alternative network owners is also included in the WHQA Product Markets where such SPs are supplying MI WHQA products to Access Seekers.

5.146 ComReg's preliminary view is that the MI WHQA Product Market does not include:

- (a) Analogue, Digital and TDM WHQA LLs;
- (b) Wholesale broadband services; and
- (c) Dark fibre services

Product Market Assessment – TI WHQA LLs

5.147 In paragraphs 5.72 to 5.80 above, ComReg set out its preliminary view that TDM WHQA products fell within a separate product market to the MI WHQA Product Market. We consider in paragraphs 5.149 to 5.182 below whether TDM LLs constitute a separate TI product market in and of itself or whether a broader TI product market definition is warranted. In doing so, ComReg considers

- (a) Demand-side substitution (discussed in paragraphs 5.149 to 5.168);
- (b) Supply-side substitution, including the self-supply of vertically integrated service providers (discussed in paragraphs 5.169 to 5.173);
- (c) Indirect constraints (discussed in paragraphs 5.174 to 5.175); and
- (d) The boundary of the trunk-terminating segments of the TI WHQA product market (discussed in paragraphs 5.176 to 5.180).

5.148 ComReg then sets out its overall preliminary conclusions on the TI WHQA product markets in paragraphs 5.181 to 5.182.

Demand-Side Substitution – TI WHQA LLs

5.149 Below ComReg considers whether Analogue and Digital LLs fall within the same product market as TDM WHQA LLs.

Do Analogue and Digital WHQA products fall within the same product market as TDM based WHQA LLs?

- 5.150 In Section 4⁴⁰⁰ ComReg set out its preliminary view that Analogue and Digital retail LLs fell within the same product market as TDM LLs. ComReg now considers below whether this is replicated at the wholesale level.
- 5.151 ComReg considers this to be the case at the wholesale level given that there are minimal differences between such LL products at either level of the supply chain. Furthermore, Oxera has set out that Analogue and Digital LLs have similar demand and supply characteristics as TDM at the wholesale level.⁴⁰¹
- 5.152 ComReg is of preliminary view that there is likely to be sufficiently effective substitutability between Analogue, Digital and TDM based WHQA LLs of certain bandwidths⁴⁰² up to and including 2Mb/s.
- 5.153 As such, ComReg considers that Analogue and Digital LLs are likely to fall within the same WHQA product market as TDM LLs.
- 5.154 ComReg refers to Analogue, Digital and TDM WHQA LLs collectively as Traditional Interface ('TI') WHQA LLs.

Chain of substitution analysis for TI WHQA LLs

Overview

- 5.155 Below ComReg sets out its preliminary view that there are separate TI WHQA product markets, namely a Low Bandwidth ('LB') TI WHQA market which includes LLs up to and including bandwidths of 2Mb/s ('**LB TI WHQA Product Market**') and a separate High Bandwidth ('HB') TI WHQA market which includes LLs above bandwidths of 2Mb/s ('**HB TI WHQA Product Market**').
- 5.156 As set out in paragraph 4.239, ComReg is of the preliminary view that there are separate retail TI markets, namely a LB TI Retail Market and a HB TI Retail Market. For similar reasoning to that set out in Section 4, ComReg also considers that the same separate TI WHQA product markets exist.

⁴⁰⁰ See paragraphs 4.175 to 4.187.

⁴⁰¹ Oxera Report; Section 3.1.6.

⁴⁰² See further discussion below commencing at paragraph 5.157 as to whether TI LLs of all bandwidths fall within the same product market.

Chain of Substitution analysis

- 5.157 As highlighted in Figure 9 above, in the retail TI markets the majority of end-users are purchasing Analogue and TDM LLs with bandwidths of up to and including 2Mb/s. However, there are a relatively small number of TDM circuits⁴⁰³ at bandwidths above 2Mb/s.
- 5.158 ComReg notes that historically TDM circuits with bandwidth increments above 2Mb/s were used for mobile backhaul applications, but these LLs have now also largely migrated to Ethernet interfaces.⁴⁰⁴
- 5.159 ComReg has also assessed Eircom's pricing of wholesale TDM circuits in order to identify whether a sufficient difference in pricing across bandwidth increments exists such that would suggest a break in the chain of substitution.
- 5.160 Oxera's analysis of Eircom's wholesale prices for analogue LL indicated⁴⁰⁵ that the price of an end-user link at 64kbps (1.5km, zero main link distance) at €698 is similar to the price of local exchange only analogue two-wire (copper pair) leased line at €615. Therefore, in response to a 5% to 10% SSNIP in TDM based WHQA, a sufficient number of purchasers of this product would be likely to switch to analogue based WHQA.
- 5.161 Oxera considered whether a continuous chain of substitution existed for TI WHQA LLs. In doing so, Oxera's analysis⁴⁰⁶ includes comparable elements from the entire cost stack faced by an Access Seeker, purchasing a single TDM leased line segment from Eircom as described in paragraph 5.163 below. Oxera examined pricing across bandwidth increments using a range of scenarios that assess whether products of adjacent bandwidths are possible substitutes, while holding other attributes such as the distance element of PPC components constant.⁴⁰⁷
- 5.162 The analysis of LL pricing at lower bandwidths (up to 2Mb/s) indicated a possible break at 1Mb/s which relates to a step-up in the pricing of an end-user link at bandwidths of 1024 Kb/s and above, as well as the fact that a >2Mb/s TDM LL requires two copper pairs instead of one. However, as noted by Oxera, price discontinuity is relatively small (6% price increase in terms of price-per-unit of bandwidth) at the 1Mb/s bandwidth.⁴⁰⁸ If higher bandwidths are required, then an SP is likely to purchase an Ethernet based circuit rather than either a number of TDM 2Mb/s LLs or a 34Mb/s LL.

⁴⁰³ 149 LLs.

⁴⁰⁴ For example ☒ [REDACTED] have migrated the ☒ [REDACTED] mobile network backhaul from TDM to Ethernet technologies.

⁴⁰⁵ Oxera Report, Table 3.6.

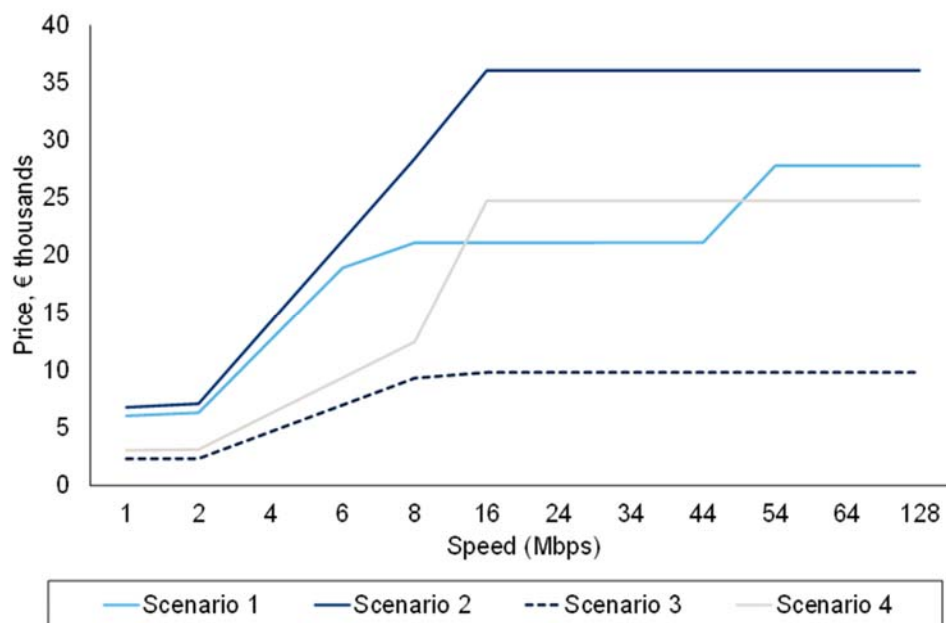
⁴⁰⁶ Oxera Report; Section 3.2.

⁴⁰⁷ In constructing different scenarios, Oxera varied end-user link, main user link and transport link distances as well as the main link type. See Table 3.6 in the Oxera Report for detailed description of assumptions used for each scenario.

⁴⁰⁸ Oxera Report; Section 3.2.2

5.163 Figure 27 below illustrates that the analysis of LL pricing at higher bandwidths indicates a significant break in pricing for TDM circuits above 2Mb/s across all scenarios which would suggest that there is no common pricing constraint between TDM LLs of 2Mb/s and TDM circuits with bandwidth increments above 2 Mb/s. In this regard, ComReg notes that the lowest available bandwidth in Ireland for TDM products above 2 Mb/s is 34 Mb/s. As noted by Oxera, unlike in other countries, 8Mb/s (E2 - copper based) TDM services are not offered in Ireland thus further indicating a potential break in the chain of substitution since there are no intermediate products with bandwidths between 2Mb/s and 34 Mb/s. Therefore, Access Seekers are unlikely to switch to higher bandwidth TDM products in response to a HM's SSNIP in WHQA prices of low bandwidth TI products. If higher bandwidths are required, then an SP is more likely to purchase an Ethernet based circuit rather than either a number of individual TDM 2 Mb/s LLs or a 34 Mb/s LL.

Figure 27: TDM bandwidth price analysis



Source: Oxera analysis of Eircom wholesale TDM leased line pricing.

5.164 Moreover, the conditions of competition in the provision of TDM services above 2Mb/s also appear to be different. Figure 30 below indicates that at the end of 2015 BT was the largest supplier of TI WHQA LL services above 2Mb/s with a market share of \times [] compared to Eircom's market share of \times []. In contrast, for TI WHQA LLs \leq 2Mb/s, Eircom's market share was [] compared to BT's [].

Preliminary conclusions on Chain of substitution analysis for TI WHQA LLs

- 5.165 Having regard to the analysis in paragraphs 5.157 to 5.164 above, ComReg considers that there is likely to be a ‘break’ in the chain of substitution for TI LL products with bandwidths above 2Mb/s displaying sufficient differences in terms of pricing and conditions of competition compared to TI LL services with bandwidth of up to and including 2Mb/s.
- 5.166 Thus, ComReg’s preliminary view is that separate TI WHQA product markets are likely to exist, namely:
- (a) Low Bandwidth Traditional Interface (‘TI’) WHQA LLs carried over analogue, digital and TDM interfaces with speed of ≤ 2 Mb/s (‘**Low Bandwidth (‘LB’) TI WHQA LLs**’); and
 - (b) High Bandwidth TI WHQA LLs w provided over a TDM interface with speeds > 2 Mb/s, (the ‘**High Bandwidth (‘HB’) TI WHQA Product Market**’).
- 5.167 Both the LB TI WHQA LLs market and HB TI WHQA LLs market are collectively referred to as the **TI WHQA LLs markets**.
- 5.168 Below ComReg considers whether the scope of the TI WHQA LL product markets should be expanded on the basis of any supply-side considerations.

Supply-Side Substitution – TI WHQA LLs

- 5.169 ComReg’s preliminary view is that as the TI WHQA product markets are declining with trivial numbers of new circuits being ordered, there is no incentive for alternative SPs to invest in building infrastructure in order to enter these markets, given any such investments are likely to be largely sunk and potentially stranded.
- 5.170 The number of LB TI WHQA LLs (and associated retail LLs) is in steady decline. In 2013 there were 9,261 such circuits in operation. By 2015, this had decreased to 5,754 – a decrease of 38% over three years. Furthermore, this demand is almost exclusively legacy, with only \approx [REDACTED] new LB TI WHQA LLs sold by Eircom in 2016.
- 5.171 ComReg considers it likely that the volumes of these TI LLs will continue to decline over the duration of the review, however, the pace of this decline is likely to be slower given reductions to date have been impacted by bulk type circuit reductions⁴⁰⁹ which have now occurred. As such, in ComReg’s view, there is likely to be insufficient potential demand to incentivise an SP to invest in infrastructure to provide LB TI WHQA in the future.
- 5.172 The same reasoning applies with respect to HB TI WHQA LLs.
- 5.173 It should also be noted that none of respondents to ComReg’s Qualitative Questionnaire indicated that they are considering launching a new TI WHQA LL services over the period of this market review.

⁴⁰⁹ In this regard, ComReg notes that Eircom’s main competitor in this market, BT, has \approx [REDACTED].

Assessment of Indirect Constraints – TI WHQA LLs

- 5.174 As noted in the context of the assessment of indirect constraints in the MI WHQA Product Market⁴¹⁰, SPs active only at the retail level could also potentially impose a degree of constraint in the relevant WHQA markets. In this context ComReg considers whether a vertically integrated SPs that is not active in the provision of TI WHQA LLs could provide a sufficient indirect constraint such that their TI Retail LLs should be included in the TI WHQA product market.
- 5.175 ComReg notes that there are no SPs that operate solely in the TI retail markets. In view of this, ComReg is of the preliminary view that that indirect constraints are not a relevant consideration in defining the TI WHQA product markets (either LB or HB).⁴¹¹

Terminating-Trunk Boundaries of the TI WHQA product markets

- 5.176 As noted in paragraphs 5.136 to 5.141 above the trunk terminating boundary between networks delineates parts of a network that may face different competitive conditions of supply. Under the 2008 Decision, the trunk-terminating boundary of the then defined wholesale LL market is delineated by a bandwidth of greater than 155 Mb/s between certain urban centres, irrespective of the network topology and type; i.e., irrespective of whether it is based on LLs over a copper or fibre network.
- 5.177 In Section 4 of the Oxera Report⁴¹² Oxera sets out in detail the issues to consider when delineating the trunk-terminating boundary in respect of this current market review. In summary, Oxera finds that there is likely to be a separate trunk markets for each of the TI WHQA LL and MI WHQA LL markets.

TI WHQA Market Trunk-Terminating Boundary Assessment

- 5.178 For the TI WHQA Markets, Oxera considered if TI WHQA LL segments that extend between PPC interconnect points may be considered as falling within a trunk market given the greater potential for aggregation that could arise between these PPC interconnection points.⁴¹³ However, Oxera states that:

“Given the absence of current (and prospective) breaks in competition in different TI segments, we propose that the national wholesale terminating TI market be defined to include the entire circuit i.e. the end-to-end TI circuit.”⁴¹⁴

⁴¹⁰ See paragraphs 5.130 to 5.135 above.

⁴¹¹ Furthermore, they are not considered relevant to the SMP assessment for similar reasons.

⁴¹² Chapter 4, Oxera Report.

⁴¹³ Section 4.3, Oxera Report.

⁴¹⁴ Section 4.2; Oxera Report.

5.179 Furthermore, ComReg is aware that there are only 8 Eircom points of interconnection (usually exchanges) where 2 or more SPs active in the TI WHQA markets are interconnected with Eircom using PPC interconnection transport links for taking EULs. Of these interconnected SPs, only one resells Eircom's TI WHQA products at the wholesale level. Other SPs use these interconnection transport links solely for voice interconnection services or for taking EULs solely for their own use.⁴¹⁵ Therefore, ComReg considers that there is insufficient competing infrastructure to suggest that it is appropriate to define a separate trunk segment between any set of exchanges for the supply of TI WHQA. Moreover, given the decline in volumes for such TI LL services generally, it is unlikely that any SP will invest in any new TI WHQA interconnection infrastructure over the period of this review. As such, the conditions of competition in all segments of TI WHQA LLs - including core conveyance – appear to be sufficiently homogenous such that ComReg is of the preliminary view that all TI WHQA LLs within each of the relevant TI WHQA Product Markets) can be considered to be terminating segments.⁴¹⁶

5.180 As such, ComReg is of the preliminary view that all segments within each of the LB TI WHQA Product Market and HB TI WHQA product market are considered to be terminating segments.⁴¹⁷

Overall preliminary conclusions on the TI WHQA Product Market

5.181 In paragraphs 5.147 to 5.180 above ComReg has considered the definition of the relevant TI WHQA markets from a product perspective and, in so doing has considered demand-side and supply-side constraints, as well as indirect constraints. ComReg's preliminary view is that the TI WHQA product markets are as follows:

- (a) a Low Bandwidth Traditional Interface ('TI') WHQA product market consisting of all wholesale leased lines carried over analogue, digital and TDM interfaces with speed of $\leq 2\text{Mb/s}$, (the '**Low Bandwidth ('LB') TI WHQA Product Market**'); and
- (b) a High Bandwidth TI WHQA product market which consists of all wholesale leased lines provided over a TDM interface with speeds $> 2\text{Mb/s}$, (the '**High Bandwidth ('HB') TI WHQA Product Market**').

⁴¹⁵ Analysis of SP information provided under the Statutory Information Requests.

⁴¹⁶ This analysis concerns the LB TI WHQA market only. As the HB TI WHQA market is preliminarily considered to not be subject to regulation, the same consideration of this issue is given as in the MI WHQA market above.

⁴¹⁷ ComReg would also note that Ofcom has included its uncompetitive regional trunk segments in the terminating segments for their TI market assessment decision in 2016; '...competitive conditions in regional trunk and terminating segments are similar. Hence, given the purpose of our TI trunk definition, we include regional trunk in a single market with TI terminating segments'. See A14.38 – A 14.64 <http://stakeholders.ofcom.org.uk/binaries/consultations/bcmr-2015/statement/final-annexes-14-25.pdf> for details.

5.182 ComReg refers to the above product markets collectively as the '**TI WHQA Product Markets**'.

Overall Preliminary Conclusions on MI WHQA and TI WHQA Product Markets

5.183 In paragraphs 5.31 to 5.182 above ComReg has considered the definition of the relevant MI and TI WHQA markets from a product perspective and, in so doing has considered demand-side, supply-side and indirect constraints. ComReg also considered the delineation of trunk-terminating boundaries. ComReg's preliminary view is that there are three separate product markets as described below.

5.184 The MI WHQA Product Market is comprised of:

- (a) Wholesale Ethernet LL;
- (b) Wholesale EFM services; and
- (c) Wholesale xWDM and other high capacity MI WHQA LLs.

5.185 The Low Bandwidth TI WHQA Product Market is comprised of:

- (a) Wholesale analogue LL; and
- (b) Wholesale TDM LL with bandwidth up to and including 2Mb/s.

5.186 The High Bandwidth TI WHQA Product Market is comprised of wholesale TDM LLs with bandwidths above 2Mb/s.

5.187 In the case of all three product markets (together referred to as the '**Relevant WHQA Product Markets**') Eircom's self-supply is included in the Relevant WHQA Markets as well as WHQA products provided over alternative networks (both physical and wireless networks). Self-supply of alternative network owners is also included in the Relevant WHQA Product Markets if these owners are supplying WHQA products to Access Seekers.

5.188 Furthermore, ComReg's preliminary view is that the Relevant WHQA Product Markets do not include:

- Wholesale broadband services; and
- Dark fibre services

Assessment of the Geographic Scope of the Relevant WHQA Product Markets

Overview

5.189 In Section 4 above ComReg considered the geographic scope of the retail LL markets and set out its preliminary view that each of the markets is likely to be national in geographic scope.⁴¹⁸

5.190 ComReg now considers the geographic scope of the Relevant WHQA Product Markets. The starting point for this assessment is the geographic scope of the retail LL markets.

5.191 The European Commission's Notice on Market Definition states that the relevant geographic market is:

*"...an area in which the undertakings concerned are involved in the supply and demand of the relevant products or services, in which area the conditions of competition are similar or sufficiently homogeneous and which can be distinguished from neighbouring areas in which the prevailing conditions of competition are appreciably different."*⁴¹⁹

5.192 The European Commission's Notice on Market Definition notes further that it:

*"...will take a preliminary view of the scope of the geographic market on the basis of broad indications as to the distribution of market shares between the parties and their competitors, as well as a preliminary analysis of pricing and price differences at national and Community or EEA level. This initial view is used basically as a working hypothesis to focus the Commission's enquiries for the purpose of arriving at a precise geographic market definition".*⁴²⁰

5.193 In assessing potential geographic variances in competitive conditions, ComReg has also acknowledged BEREC Common Position on Geographic Aspects of Market Analysis⁴²¹.

5.194 Having regard to the above, ComReg assesses the geographic scope of the Relevant WHQA Product Markets according to the following criteria:

- (a) Geographic differences in entry conditions over time;
- (b) Variation in the number and size of potential competitors;
- (c) Distribution of market shares; and

⁴¹⁸ See paragraphs 4.209 to 4.238 above.

⁴¹⁹ European Commission Notice on Market Definition, paragraph 8.

⁴²⁰ European Commission Notice on Market Definition, paragraph 28.

⁴²¹ BEREC "[Common Position on Geographic Aspects of Market Analysis](#)", BoR (14) 73, 05.06.2014.

- (d) Evidence of differentiated pricing or marketing strategies.
- 5.195 The main preliminary conclusions reached are that each of the Relevant WHQA Product Markets is National in scope.
- 5.196 However, ComReg has found that although there may be some differences in the conditions of competition in certain geographic areas for the MI WHQA Product Market – namely Business Parks, there is insufficient evidence that the conditions of competition are appreciably heterogeneous to warrant the designation of separate geographic markets.
- 5.197 Having regard to the above, below ComReg considers the following:
- (a) Geographic scope assessment in the TI WHQA Product Markets (discussed in paragraphs 5.199 to 5.206); and
 - (b) Geographic scope assessment in the MI WHQA Product Market (discussed in paragraphs 5.207 to 5.237);
- 5.198 ComReg’s overall preliminary conclusions on the geographic scope of the above markets is set out in paragraphs 5.238 to 5.242.

TI WHQA Product Markets – Geographic Scope Assessment

Geographic differences in entry conditions over time:

- 5.199 Eircom offers TI WHQA products across its ubiquitous network, which means that an Access Seeker can purchase TI WHQA inputs in any region across the State. There are a small number of other SPs providing TI WHQA LLs, with their individual market shares being low, but with BT being the main other SP to provide a limited competitive constraint. This position has not changed over time.
- 5.200 Moreover, as noted in the Section 4⁴²² above, TI retail LLs are predominantly used by utility operators as well as financial, transport and government institutions for activities that do not require high bandwidth services such as remote network monitoring, critical system control and secure transactional applications. However, as retail TI LL services are mainly provided over the copper network and the demand is almost exclusively of a legacy nature, it is unlikely that alternative network infrastructure will be put in place over the duration of this review to serve either TI WHQA or retail markets.
- 5.201 Given the above, there does not appear to have been or is there expected to be sufficient differences in competition or entry conditions over the duration of this review to warrant sub-national geographic TI WHQA markets.

⁴²² See paragraph 4.152 above.

Variation in the number and size of potential competitors

5.202 BT is Eircom's main competitor in the provision of TI WHQA services and as such Eircom faces some degree of competition from BT. The limited variations in the number and size of potential competitors across geographic areas does not suggest that sub-national geographic TI WHQA markets are warranted.

Distribution of market shares

5.203 Given the network coverage of SPs supplying TI WHQA LLs and the lack of variation in the number and size of potential competitors, in ComReg's preliminary view, a more localised geographic inspection of market shares is unlikely to show any significant variation in competitive conditions across geographic areas.

Evidence of differentiated pricing or marketing strategies

5.204 ComReg is not aware of any SP differentiating their TI WHQA LLs by geographic area. The two main suppliers of TI WHQA both stated in their response to the Qualitative Questionnaire that they do not differentiate by geographic area. However, §<[REDACTED] stated that service may be dependent on distance from the serving exchange.⁴²³

Conclusion on Geographic Scope of TI WHQA Product Markets

5.205 In summary, ComReg notes that the supply of TI WHQA products is very concentrated with Eircom supplying the majority of TI WHQA products, followed by BT⁴²⁴. Given the assessment above, the evidence that there are insufficient geographic differences in entry conditions over time and insufficient variations in the number and size of potential competitors or the distribution of market shares to be suggestive of separate geographic markets

5.206 ComReg preliminary view is that the TI WHQA Product Markets are national in scope.

⁴²³ Response to Qualitative Questionnaire.

⁴²⁴ Although as noted later in Section 6, BT has a higher market share in the HB TI WHQA Product Market, although the total number of LLs is low.

MI WHQA Product Market – Geographic Scope Assessment

Geographic differences in entry conditions over time:

- 5.207 Eircom offers MI WHQA products across its ubiquitous network and Access Seekers can purchase MI WHQA inputs in most locations.⁴²⁵ In relation to MI WHQA services supplied over alternative networks, as noted in paragraphs 3.15 to 3.25 above, there is evidence of increased availability of MI WHQA products being offered via alternative wired and wireless networks since the 2008 Decision. This includes the development of the State owned MANs which have provided fibre networks to 94 urban areas of the State.⁴²⁶
- 5.208 The presence of alternative networks has increased particularly in areas of high business activity, such as business parks⁴²⁷ and data centres⁴²⁸, but also in campuses of 3rd level education institutions (together referred to as '**Business Parks**').⁴²⁹ In these areas, civil engineering infrastructure such as duct networks may be more accessible and demand for retail MI LL services is likely to be more concentrated due to the fact that these networks have been developed in areas where there is likely to be more demand for retail MI LL services.
- 5.209 As such, ComReg has assessed if there may be certain geographic areas within which entry conditions in the MI WHQA Product Market are lower and/or where entry barriers have been overcome. Given the availability of competing wired infrastructure provided by alternative SPs, ComReg is of the view that Business Parks are suitable areas for investigating potential geographic differences in entry conditions.
- 5.210 In order to ascertain whether there are substantial differences in entry conditions inside/outside of Business Parks, ComReg has examined the presence of alternative networks in Business Parks using the information provided by LL SPs in response to the SIRs.

⁴²⁵ We note that Eircom purchases some MI WHQA from other SPs.

⁴²⁶ See paragraph 3.23 above.

⁴²⁷ Business parks are sites that contain clusters of typically commercial businesses. They tend to be located in suburban areas and near to main roads. As these tend to group similar types of end-user demand (i.e. corporate or IT specific firms) in one location, the costs for operators connecting to these sites are lower compared to areas where end-user premises are more dispersed.

⁴²⁸ Data centres, in the broadest sense, are premises whose main purpose is to house computing and communications equipment in secure locations and which therefore require very high capacity LL as well as dark fibre to carry data to and from their facilities.

⁴²⁹ See Appendix: 5 for a full list of Business Parks.

- 5.211 As noted by Oxera⁴³⁰ and further explained in Appendix: 3, limitations in the availability of information e.g. absence of X, Y coordinates of customer premises, hindered ComReg from making a detailed 'reachability' analysis that would precisely identify which premises can be reached by alternative infrastructures within the State.
- 5.212 Appendix: 5 lists a number of Business Parks connected to three or more competing SP wired infrastructures (and that are able to provide MI WHQA services to Access Seekers⁴³¹). These regionally dispersed Business Parks have multiple alternative competing wired infrastructures where the evidence suggests that barriers to entry may have been lower and likely to have been overcome.
- 5.213 While the available information indicates potentially different conditions of competition in these areas, such information is insufficient to identify whether areas adjacent to Business Parks or other areas of concentrated business activity such as retail parks or urban centres are also reachable by multiple alternative infrastructures.⁴³² Thus, as noted by Oxera, the identification of more general clear and stable geographic boundaries is not possible.⁴³³
- 5.214 ComReg also notes that SPs providing MI WHQA LLs over wireless infrastructure such as Airspeed and Digiweb, have nationwide coverage⁴³⁴ and thus, have ability to provide MI WHQA LL services inside and outside of Business Parks.

Variation in the number and size of potential competitors

- 5.215 In order to ascertain whether there is significant variation in the number and size of Eircom's competitors inside/outside of Business Parks, ComReg has closely inspected each LL purchaser's address and the associated local physical access portion of these purchasers' LLs (as provided by SPs in response to ComReg's SIRs for the year 2014).⁴³⁵
- 5.216 Double ended P2P circuits were split into their 2 distinct physical ends in order to count the locations of these circuit ends. Thus, for the purpose of this exercise, double ended circuits were counted twice as one or both ends could be in inside or outside the set of 209 business parks under consideration.

⁴³⁰ Oxera Report, Section A5.2.

⁴³¹ These Business Parks were chosen as they meet the criterion set out in Paragraph 2.22 of the 2012 Price Control Obligation Decision, whereby Eircom can seek relief from the MS obligation laid out therein.

⁴³² However, as detailed in paragraph 3.23, the MAN network is subject to contractual requirements to provide wholesale access at maximum prices.

⁴³³ The Oxera Report; Section 8.2.4.

⁴³⁴ See Appendix A.11 for more details.

⁴³⁵ ComReg chose 2014 as representative of SPs customer locations as it had the most complete and most rigorously audited data of the three years submitted. See Appendix: 3 for further details on Data treatment.

- 5.217 In instances where addresses were not complete or not provided by SPs, ComReg had to make reasonable assumptions about the location of LL purchasers. For example, ComReg assumed that purchasers of LLs such as the Department of Justice, the Revenue Commissioners and HEAnet are located outside of Business Parks⁴³⁶ and thus, physical access ends of circuits purchased by these customers were classified as located outside Business Parks. Similarly, private companies involved in provision of retail services, such as grocery multiples or financial services are likely to be located on high streets or retail parks. Thus, LL purchased by these companies were assumed to be located outside Business Parks. This analysis was, however, augmented by confirming addresses through internet searches.
- 5.218 As outlined in greater detail in Appendix: 3 issues were experienced with address information supplied by SPs, in most cases due to the non-availability of such information. Nevertheless, as set out in Appendix: 3, ComReg is confident that the information underpinning the analysis presented in this Consultation is likely to accurately depict the competitive conditions inside and outside of Business Parks.
- 5.219 The analysis indicates that most SPs engaged in the provision of MI WHQA LLs are supplying such services both inside and outside of Business Parks. However, as highlighted in Table 14 below, the distribution of physical ends of access circuits among these competitors is somewhat different within these two areas.
- 5.220 Some SPs appear to have concentrated their supply more towards Business Parks,⁴³⁷ whereas others have sought to sell to customers in other areas⁴³⁸ and some have targeted both.⁴³⁹
- 5.221 However, this does not indicate in and of itself that there are sufficient variations in the size and number of competitors across different geographic, as all SPs active in the provision of MI WHQA LLs are offering similar services.

⁴³⁶ Courts, Garda Stations and schools are unlikely to be located in Business Parks.

⁴³⁷ E.g.; ☒ [REDACTED], ☒ [REDACTED], ☒ [REDACTED].

⁴³⁸ E.g.; ☒ [REDACTED], ☒ [REDACTED], ☒ [REDACTED] and ☒ [REDACTED].

⁴³⁹ E.g.; ☒ [REDACTED], ☒ [REDACTED], ☒ [REDACTED].

Table 14: Physical access circuit ends locations, 2014 Data [REDACTED]

SP	Physical access circuit ends inside Business Parks	Physical access circuit ends outside Business Parks
Airspeed	[REDACTED]	[REDACTED]
AT&T	[REDACTED]	[REDACTED]
BT	[REDACTED]	[REDACTED]
Colt	[REDACTED]	[REDACTED]
Digiweb	[REDACTED]	[REDACTED]
Eircom	[REDACTED]	[REDACTED]
enet	[REDACTED]	[REDACTED]
ESB	[REDACTED]	[REDACTED]
EU Networks	[REDACTED]	[REDACTED]
Fullnet/Strencom	[REDACTED]	[REDACTED]
Inland Fibre	[REDACTED]	[REDACTED]
Three	[REDACTED]	[REDACTED]
Magnet	[REDACTED]	[REDACTED]
Verizon	[REDACTED]	[REDACTED]
Virgin Media	[REDACTED]	[REDACTED]
Vodafone	[REDACTED]	[REDACTED]
Total	[REDACTED]	[REDACTED]

Note: Percentages in brackets indicate operators' circuit distribution inside/outside Business Parks.

Distribution of market shares

5.222 Figure 28 below outlines a geographic distribution of market shares in terms of physical ends of access circuits in the MI WHQA market at the end of 2014⁴⁴⁰. In line with MGF approach market shares were estimated on presumption that regulation is absent in the MI WHQA market. Therefore, this count was of on-net circuits at both wholesale and retail levels, to avoid any double-counting of resold circuits (any circuits resold at the retail level in particular, has reverted to the on-net wholesale original supplier).

5.223 Overall, the analysis shows that no SP has a market share above 20% inside Business Parks and no SP has a market share above 30% outside Business Parks.

⁴⁴⁰ Due to gaps in customer location information, ComReg was not able to estimate geographical market share distribution in 2013. In relation to 2015 information, ComReg has not yet completed a final audit of information provided and thus, market geographical market share distribution is not available yet. Nevertheless, ComReg notes that initial inspection of 2015 data did not alter ComReg's preliminary view in relation to geographic WHQA market definition that is based on observed competitive conditions inside/outside Business Parks in 2014.

- 5.224 Looking at the figures in more detail, inside Business Parks Eircom's 2014 market share was \times [REDACTED]⁴⁴¹, while outside Business Parks its market share was \times [REDACTED]⁴⁴². ComReg also notes that the distribution of market shares among Eircom's competitors also differs within these two distinct areas. For example, SPs providing P2P radio link based MI WHQA LLs, such as Digiweb and Airspeed, have higher market shares in areas outside of Business Parks (in comparison to inside Business Parks) with market shares of \times [REDACTED]⁴⁴³ and \times [REDACTED]⁴⁴⁴ respectively. Conversely, enet, Virgin Media and Colt have higher market shares inside Business Parks relative to their market shares outside of business parks.
- 5.225 The Oxera Report presents geographic distributions of market shares calculated using a different methodology. Oxera inspected the list of addresses provided by SPs of MI WHQA LL services and used a word search based on the list of Business Parks collated by ComReg to count the number of instances that an address registered a term that indicated a likely Business Park address.⁴⁴⁵
- 5.226 The market shares distribution presented in the Oxera Report indicates that Eircom has a market share of \times [REDACTED]⁴⁴⁶ inside Business Parks and \times [REDACTED]⁴⁴⁷ outside Business Parks.⁴⁴⁸
- 5.227 However, it should be noted that these Oxera calculated market shares are based on MI WHQA LLs sold in the wholesale merchant market only and do not take account of any SPs retail self-supply. As such, then figures may not be exactly comparable to the figures in paragraph 5.224 above. While Eircom dependent MI WHQA LLs are considered part of Eircom's market share, similar OAO dependent MI WHQA LLs have not been included in the OAOs' market share calculations. Furthermore, the corresponding retail only market shares for Eircom are \times [REDACTED]% inside of Business Parks and \times [REDACTED]% outside of Business Parks⁴⁴⁹ and as there are more retail MI LLs than MI WHQA LLs, this means that the Oxera figures are not directly comparable with the ComReg market shares in Figure 28 below.

⁴⁴¹ Less than 25%.

⁴⁴² Less than 35%.

⁴⁴³ Less than 20%.

⁴⁴⁴ Less than 20%.

⁴⁴⁵ See Annex A5.1 of the Oxera Report. Note that this figure excludes MI WHQA LLs \leq 2Mbs, which are located predominantly outside of Business Parks. See also paragraph A 3.10 in Appendix: 3 for further details regarding the Oxera calculation methodology.

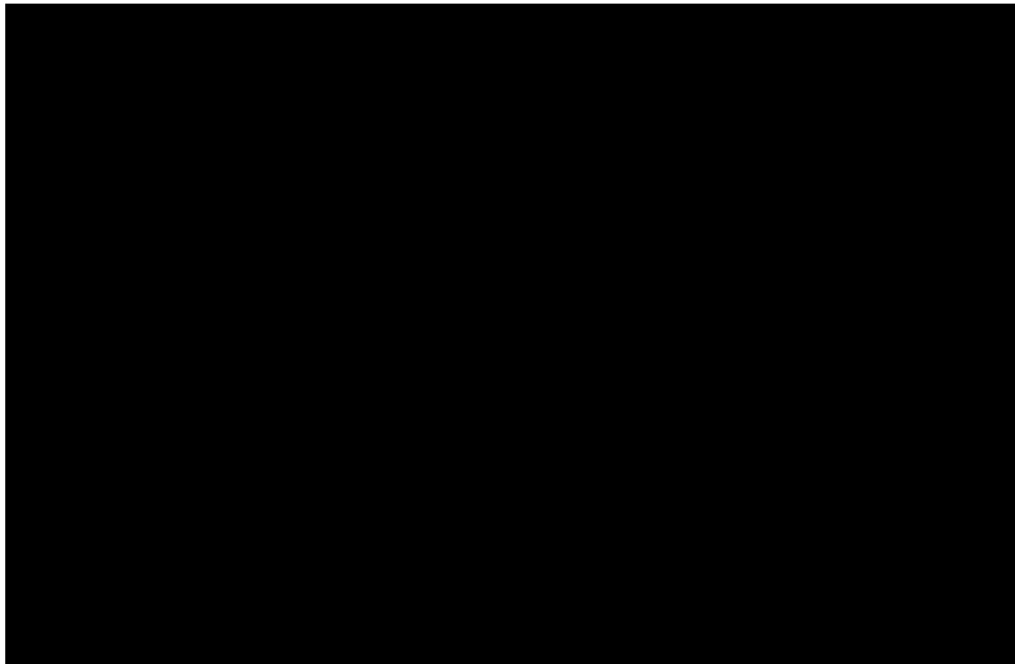
⁴⁴⁶ Less than 25%.

⁴⁴⁷ Less than 45%.

⁴⁴⁸ See Table 8.2; Oxera Report.

⁴⁴⁹ See Table 8.1; Oxera Report.

Figure 28: MI Market Shares 2014, inside & outside Business Parks including retail self-supply – method 3 (all physical ends) ✂[REDACTED]



Note: Market Share data is based on LL circuit information, absent regulation in the MI WHQA Market. This assumes that only those operators with an independent network (i.e. self-supply) or operators using upstream inputs from MI WHQA suppliers other than Eircom can provide retail and/or wholesale services. These figures assume that end-users purchasing LL that are dependent on Eircom's MI WHQA products revert to being Eircom customers, assuming Eircom will withdraw its wholesale supply absent regulation in the MI WHQA Market. Other operators that provide services in the MI WHQA Market would continue to do so. Method 3 was used (double-ended) count of each physical end, where supplied as described in Appendix: 3, on data treatment. This allowed ComReg to count the number of ends in each candidate geographic market.

- 5.228 In ComReg's preliminary view, these market shares while indicative of some geographic variations in market shares, are not sufficient in and of themselves to suggest the delineation of stable and consistent separate geographic boundaries within the MI WHQA market.
- 5.229 Moreover, as discussed in more detail in Section 6, the identification of separate geographic MI WHQA markets does not alter ComReg's competition assessment in MI WHQA market given that SP market shares information both inside and outside Business Parks, alongside other information on the conditions of competition including the level of infrastructure based competition, suggests that no SP has SMP in the MI WHQA market.

Evidence of differentiated pricing or marketing strategies

- 5.230 ComReg has assessed whether there is evidence of differentiated pricing or marketing that might indicate the presence of different regional or local competitive conditions, and in particular, geographically de-averaged or differentiated pricing. Furthermore, variation in product quality between geographic areas (which may infer effective price differences), or variation in the marketing of MI WHQA LL products may also be suggestive of localised competitive pressures within the MI WHQA market.
- 5.231 While in general Eircom's WHQA products are based on a nationally averaged pricing approach (albeit subject to SMP regulation), pricing of Eircom's NGN Ethernet services is based on a nationally de-averaged approach whereby regulated prices reflect differences in terms of costs and economies of scale/scope between the more urban areas in Ireland and the more rural areas for the provision of NGN Ethernet services.
- 5.232 Thus, the existing regulatory price control obligations recognise the geographic differences in costs of delivering some of the MI WHQA services as well as variation in competitive conditions across the State and Eircom is allowed to apply geographically differentiated pricing of its MI WHQA LL products. This evidence could suggest that Eircom is facing somewhat different competitive conditions specifically in the provision of MI WHQA between different geographic areas. On the other hand, it could be reflective of underlying cost conditions.
- 5.233 In relation to pricing behaviour of other SPs, ComReg notes that as part of the geographic market assessment, SPs currently supplying MI WHQA services were asked whether they differentiate their MI WHQA LL product functionality and or pricing/marketing on a geographic basis⁴⁵⁰. All respondents indicated that they did not differentiate the prices or functionality of their MI WHQA products on a geographic basis where these products are delivered using own network inputs.⁴⁵¹
- 5.234 In instances where MI WHQA LL products are delivered using other SPs' network inputs, respondents noted that functionality and pricing of such products is more restricted compared to MI WHQA products delivered using own network inputs.
- 5.235 As such, pricing differences appear to be based on availability of on-net infrastructure to deliver the services, rather than a pricing strategy.

⁴⁵⁰ ComReg Qualitative Questionnaire; June 2015.

⁴⁵¹ Based on the responses to the ComReg Qualitative Questionnaire.

Preliminary Conclusion on Geographic Scope of the MI WHQA Market

- 5.236 ComReg's preliminary view is that the MI WHQA Market is national in scope⁴⁵². ComReg's analysis of competitive conditions inside/outside Business Parks⁴⁵³ indicated that all MI WHQA SPs supply services in both areas, although the distribution of market shares amongst them is somewhat different. While there is some evidence to suggest that there might be differences in competitive conditions between more urban and more rural areas, the available evidence is insufficient to identify stable and consistent boundaries that would suggest distinct sub-geographic MI WHQA markets.
- 5.237 Furthermore, as discussed in greater detail in Section 6 below, the delineation or otherwise of separate geographic MI WHQA markets does not impact upon ComReg's overall preliminary views on its assessment of competition in the MI WHQA market given that no SMP is found, on a preliminary basis, to have SMP.

Overall Preliminary Conclusions on Definition of the WHQA Markets

- 5.238 In paragraphs 5.23 to 5.237 above ComReg has considered the definition of the relevant WHQA market from a product and geographic perspective. ComReg's preliminary view is that there are three separate markets as described below.
- (a) Low Bandwidth Traditional Interface ('**TI**') WHQA Market consisting of all wholesale leased lines carried over analogue, digital and TDM interfaces with speed of $\leq 2\text{Mb/s}$, with this market being national in its geographic scope (the '**Low Bandwidth ('LB') TI WHQA Market**'); and
 - (b) High Bandwidth TI WHQA Market which consists of all wholesale leased lines provided over a TDM interface with speeds $> 2\text{Mb/s}$, with this market being national in its geographic scope (the '**High Bandwidth ('HB') TI WHQA Product Market**').
 - (c) Modern Interface ('**MI**') WHQA Market consisting of all wholesale leased lines carried over interfaces such as Ethernet, EFM xWDM and other such high bandwidth interfaces, with this market being national in its geographic scope (the '**MI WHQA Product Market**');
- 5.239 The above product markets (together referred to as the '**Relevant WHQA Markets**') do not distinguish between the different types of media (wireless, fibre, copper) used to provide WHQA LLs. i.e, it is transmission media neutral.
- 5.240 Asymmetric business broadband is not considered a substitute for a WHQA LL due to the likely lack of effective supply and demand side substitutability between the products.

⁴⁵² This is consistent with ComReg's preliminary view that the retail LL market is likely to be national.

⁴⁵³ As noted in paragraph 5.208 above, presence of alternative networks has increased particularly in Business Parks.

- 5.241 Furthermore, passive infrastructure, such as Dark Fibre, is not considered to be an effective substitute for a WHQA LL.
- 5.242 In the case of the Relevant WHQA Markets, Eircom's self-supply is included in the as well as WHQA products provided over alternative networks (both physical and wireless networks). Self-supply of alternative network owners is also included in the Relevant WHQA Markets if these owners are supplying WHQA products to Access Seekers.

Question 3: Do you agree with ComReg's preliminary conclusions on the product and geographic assessment for the Relevant WHQA Markets? Please explain the reasons for your answer, clearly indicating the relevant paragraph numbers to which your comments refer, along with all relevant factual evidence supporting your views.

6. Competition Analysis and Assessment of SMP in the WHQA Markets

Introduction

- 6.1 This Section sets out ComReg's preliminary views on competition in the each of the Relevant WHQA Markets defined in Section 5.
- 6.2 ComReg's preliminary view is that Eircom has SMP in the Low Bandwidth TI WHQA Market. Furthermore, ComReg is of the view that no SP has SMP in either the High Bandwidth TI WHQA Market or the MI WHQA Market as they are considered to be prospectively competitive.
- 6.3 This Section is set out as follows:
- (a) First, we describe the framework and our approach for assessing SMP in these markets (discussed in paragraphs 6.4 to 6.24) ;
 - (b) Second, we then assess competition in the LB TI WHQA Market and the HB TI WHQA Market; (discussed in paragraphs 6.25 to 6.98 and 6.99 to 6.107 respectively);
 - (c) Third, we then assess competition in the MI WHQA Market (discussed in paragraphs 6.108 to 6.141);

Framework for Assessing SMP

- 6.4 Having defined three separate Relevant WHQA Markets, ComReg is required to determine whether each WHQA market is effectively competitive having regard to whether or not any of the SPs operating within them have SMP.
- 6.5 The European regulatory framework for electronic communications networks and services has aligned the concept of SMP with the competition law definition of dominance advanced by the Court of Justice of the European Union in *United Brands v. Commission*⁴⁵⁴:

⁴⁵⁴ Case 27/76 United Brands v European Commission [1978] ECR 207, Paragraph 65. See also paragraph 70 of the [SMP Guidelines](#).

“The dominant position referred to [by Article 102 of the Treaty on the Functioning of the European Union] relates to a position of economic strength enjoyed by an undertaking which enables it to prevent effective competition being maintained on the relevant market by affording it the power to behave to an appreciable extent independently of its competitors, customers and ultimately of its consumers.”

6.6 Article 14(2) of the Framework Directive⁴⁵⁵ effectively mirrors this definition of dominance and states that:

“An undertaking shall be deemed to have significant market power if, either individually or jointly with others, it enjoys a position equivalent to dominance, that is to say a position of economic strength affording it the power to behave to an appreciable extent independently of competitors, customers and ultimately consumers.”

6.7 Arising from this definition, ComReg assesses whether SMP exists in accordance with the framework established by the European Commission.

6.8 The European Commission’s SMP Guidelines, of which ComReg is required to take utmost account⁴⁵⁶, refer to a range of criteria that may be considered by National Regulatory Authorities (**NRAs**) when seeking to establish whether any undertaking(s) has SMP in a relevant market.

6.9 The SMP Guidelines state that according to established case-law, very large market shares (that is, market shares in excess of 50%) are in themselves, save in exceptional circumstances, evidence of the existence of a dominant position:

According to established case-law, very large market shares — in excess of 50% — are in themselves, save in exceptional circumstances, evidence of the existence of a dominant position. An undertaking with a large market share may be presumed to have SMP, that is, to be in a dominant position, if its market share has remained stable over time⁴⁵⁷

6.10 Furthermore, the SMP Guidelines state that;

- single dominance concerns normally arise where market shares exceed 40%;
- concerns can also arise at lower shares depending on the difference between the market shares of the undertaking in question and that of its competitors; and;
- undertakings with market shares of no more than 25% are not likely to enjoy a (single) dominant position on the market concerned.⁴⁵⁸

⁴⁵⁵ Which is transposed into Irish law by Regulation 25(1) of the Framework Regulations.

⁴⁵⁶ In accordance with Regulation 25(2) of the Framework Regulations.

⁴⁵⁷ Paragraph 75 of the SMP Guidelines.

⁴⁵⁸ *Ibid.*

6.11 Market shares in excess of 50% therefore, give rise to a strong presumption of SMP.⁴⁵⁹ However, the SMP Guidelines also state that the existence of a high market share alone is not sufficient to establish the existence of SMP; rather it means that the undertaking concerned might be in a dominant position and this needs to be considered alongside other potentially relevant criteria for assessing the existence of SMP, including the following:⁴⁶⁰

- Overall size of the undertaking;
- Control of infrastructure not easily duplicated;
- Technological advantages or superiority;
- Absence of or low countervailing buyer power;
- Easy or privileged access to capital markets/financial resources;
- Product/services diversification (e.g. bundled products or services);
- Economies of scale;
- Economies of scope;
- Vertical integration;
- A highly developed distribution and sales network;
- Absence of potential competition; and
- Barriers to expansion.

6.12 The relative importance of each factor may vary from one analysis to the next as the characteristics or dynamics of the relevant market under examination change. Consequently, flexibility is needed in applying the above criteria. In addition, many of the above factors, while presented separately, may in fact be interrelated and all available evidence is considered by ComReg as a whole before a determination on SMP is made. In this respect, the SMP Guidelines note that:⁴⁶¹

“A dominant position can derive from a combination of the above criteria, which taken separately may not necessarily be determinative.”

⁴⁵⁹ Ibid

⁴⁶⁰ Paragraph 78 of the SMP Guidelines

⁴⁶¹ Paragraph 79 of the SMP Guidelines

Approach to Assessing SMP in the Relevant WHQA Markets

6.13 ComReg's approach to assessing whether an undertaking has SMP in the Relevant WHQA Markets is to carry out a forward looking analysis on the basis of existing and likely future market conditions⁴⁶² and to consider the range of factors identified above that are of most relevance to these markets.

Relevant SMP Criteria

6.14 For the purposes of the analysis of the Relevant WHQA Markets, ComReg considers that the following criteria are of most relevance to the SMP assessment in these markets:

- Overall size of the undertaking;
- Control of infrastructure not easily duplicated;
- Absence of or low countervailing buyer power;
- Product/services diversification (e.g. bundled products or services);
- Economies of scale and scope;
- Vertical integration;
- Absence of potential competition; and
- Barriers to expansion.

Non Relevant SMP Criteria

6.15 ComReg has considered other factors that could be used to indicate the potential market power of an undertaking but which, for the reasons set out below, are considered of little or no relevance for the purposes of the SMP assessment in the WHQA markets.

⁴⁶² Paragraph 20 of the SMP Guidelines states that "In carrying out the market analysis NRAs will conduct a forward looking, structural evaluation of the relevant market, based on existing market conditions. NRAs should determine whether the market is prospectively competitive, and thus whether any lack of effective competition is durable, by taking into account expected or foreseeable market developments over the course of a reasonable period. The actual period used should reflect the specific characteristics of the market and the expected timing for the next review of the relevant market by the NRA. NRAs should take past data into account in their analysis when such data are relevant to the developments in that market in the foreseeable future."

Technological advantages or superiority

- 6.16 Technological advances or superiority can represent a barrier to entry as well as conferring the ability for an undertaking to achieve cost or production advantages/efficiencies over its competitors. However, the technologies being used to provide both TI and MI LLs appear to have little or no bearing on the assessment of SMP in the WHQA markets. In particular, it would appear that any technological advance made by one operator could, from a purely technological point of view be adopted over time by others. This criterion is, therefore, considered of less relevance in the WHQA markets.

Easy or privileged access to capital markets/financial resources

- 6.17 Easy or privileged access to capital markets may act as a barrier to entry in markets where small private companies are competing with a large incumbent, and are not able to leverage sufficient finance to invest in alternative infrastructure and use it to compete effectively with the incumbent.
- 6.18 ComReg considers that this is unlikely to be a factor in the WHQA markets, considering that there are a number of existing competitors (in some cases at both the retail and wholesale level) that are subsidiaries of large parent companies e.g. BT, Vodafone Ireland, Virgin Media. These SPs are equally able to access capital markets, and are therefore not at a disadvantage relative to the incumbent. This criterion is, therefore, considered of little or no relevance.

A highly developed distribution and sales network

- 6.19 The need to establish sophisticated distribution systems might delay short term market entry. However, entry into the WHQA markets is unlikely to involve establishing extensive distribution and sales networks, since there are only a relatively small number of potential business customers.
- 6.20 In any case, existing competitors which have an existing base of wholesale customers with an appropriately scaled existing distribution and sales network and given the market shares in the relevant markets show that they are likely to have a highly developed sales and distribution network. This criterion is unlikely therefore to represent a significant barrier to entry in the WHQA markets.

Approach to Existing Regulation

- 6.21 In markets subject to ex-ante SMP regulation a SP's behaviour may also be restricted by way of existing SMP regulatory controls. It is necessary, however, to consider the potential ability of the undertaking to exert market power in the absence of ex-ante SMP regulation⁴⁶³ in the markets concerned. To do otherwise could lead to a circular finding of non-dominance on the basis of SMP regulatory remedies that would cease to exist following the completion of a market analysis and, in the absence of which, the authorised undertaking may be able to exert market power. In the context of an SMP assessment, in the Relevant WHQA Markets, the key questions to be assessed are:
- (a) How the SP in question would be likely to behave in the markets being assessed if it were free from current or potential SMP regulatory constraints; and
 - (b) How the SP in question would be likely to behave in the market being assessed having regard to the existence of any SMP and other obligations in related markets which could impact in the Relevant WHQA Markets.⁴⁶⁴

Assessment of Competition and SMP

- 6.22 Each of the relevant factors identified in paragraph 6.14 above is considered in detail below. Given an inherent degree of overlap, ComReg proposes to combine its assessment of these factors under the following three broad headings:
- (a) **Existing competition in the Relevant WHQA Markets:** an assessment of factors such as vertical integration, market shares, relative strength of existing competitors, barriers to expansion, indirect constraints, and pricing behaviour;
 - (b) **Potential competition in the Relevant WHQA Markets:** an assessment of factors such as control of infrastructure not easily duplicated, barriers to entry in the Relevant WHQA Markets, as well as considering the overall strength of potential competitors;
 - (c) **Strength of any countervailing buyer power (CBP):** an assessment of the impact posed by any strong buyers of WHQA products on the competitive behaviour of WHQA SPs.⁴⁶⁵

⁴⁶³ However, while discounting SMP regulation in the market concerned, other obligations (such as, for example, relevant SMP remedies existing in other markets, or obligations relating to general consumer protection) are assumed to be in place.

⁴⁶⁴ In the context of the WHQA Markets, the most pertinent related market is the Wholesale Local Access ('WLA') Market (formerly the WPNIA market). This market – referred to as Market 3a; Wholesale Local Access – is currently under review by ComReg and a consultation and draft decision is due in Q3 2016.

⁴⁶⁵ It should be noted that where it found that existing competition is sufficient to ascertain that an undertaking is not likely to have SMP in a relevant market, then the competitive constraint imposed by likely


- 6.23 In this section ComReg presents its preliminary views on the assessment of competition and SMP in the Relevant WHQA Markets, in particular,
- (a) competition and SMP in the Low Bandwidth TI WHQA Market is discussed in paragraphs 6.25 to 6.98;
 - (b) competition and SMP in the High Bandwidth TI WHQA Market is discussed in paragraphs 6.99 to 6.107; and
 - (c) competition and SMP in the MI WHQA Market is discussed in paragraphs 6.108 to 6.141.
- 6.24 Insofar as existing competition based on indirect retail constraints is concerned, in Section 5 ComReg set out its preliminary view that such constraints are not sufficiently material to impact the assessment of market definition. Furthermore, ComReg is of the view that such constraints are not sufficiently material to the assessment of competition in the Relevant WHQA Markets.

Assessment of Competition in the Low Bandwidth TI WHQA Market

- 6.25 We now assesses competition in the Low Bandwidth TI WHQA Market. After looking at market shares (and other factors) to assess existing competition, which indicate that Eircom has a high (and increasing) share of this market, we then examine the impact of potential competition and CBP before concluding the Eircom is likely to have SMP in this market.

Existing Competition in the Low Bandwidth TI WHQA Market

Market shares in the Low Bandwidth TI WHQA Market

- 6.26 Figure 29 below shows the hypothetical shares in the Low Bandwidth TI WHQA Market over the period 2013 to 2015.⁴⁶⁶ It illustrates that Eircom had a high and persistent market share over the entire period⁴⁶⁷ with its market share having increased to ⁴⁶⁸ in 2015.

potential competition and countervailing buyer power are of relatively less importance with the exception markets where there is a concern that the existing competition may not be stable.

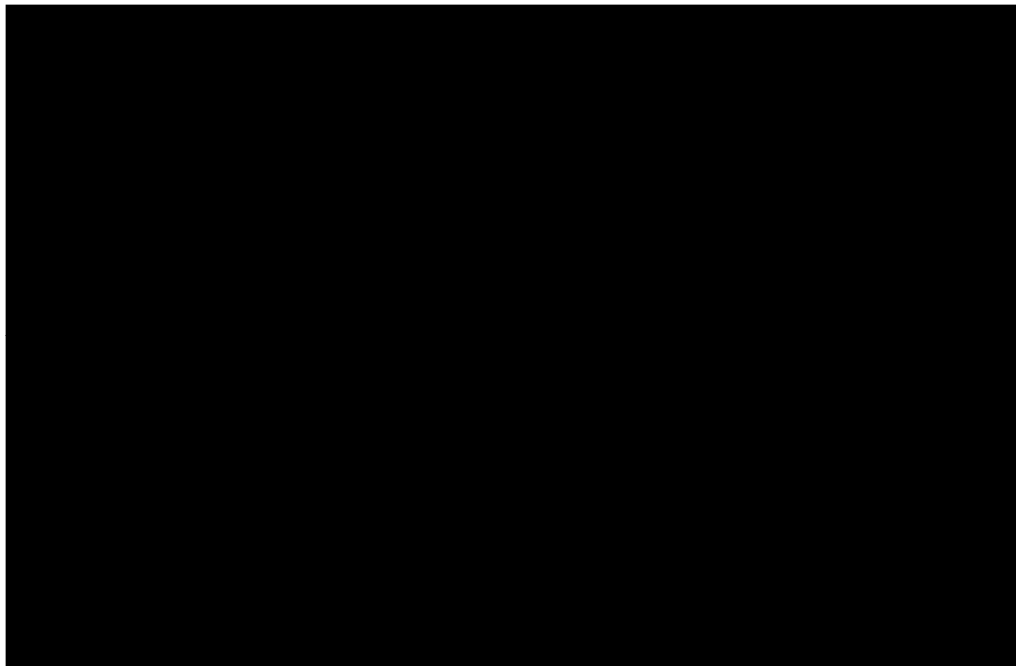
⁴⁶⁶ These shares are considered hypothetical as they include both retail and wholesale self-supply as such retail self-supply could be switched to the wholesale market without incurring significant costs.

⁴⁶⁷ Eircom's market share has remained above 65% for each of the years in the period 2013 to 2015.

⁴⁶⁸ Greater than 75%.

6.27 Moreover, Eircom's share of what is a slowly declining market has increased over this period. In this regard, ComReg notes that Eircom's main competitor in this market (BT)⁴⁶⁹ has \times [REDACTED] with this leading to an increase in Eircom's market share by \times [REDACTED]⁴⁷⁰. Moreover, BT indicated⁴⁷¹ that \times [REDACTED], thus suggesting that BT is unlikely to increase its market share within the lifetime of this market review.

Figure 29: Hypothetical⁴⁷² Market Shares – Low Bandwidth TI WHQA Market \times [REDACTED]



6.28 It should also be noted that, as indicated in Table 8.5⁴⁷³ of the Oxera Report, Eircom's existing competitors in the Retail Low Bandwidth TI Market continue to be heavily dependent on Eircom's wholesale inputs when providing retail services. Overall, at the end of 2015 \times [REDACTED]⁴⁷⁴ of retail Low Bandwidth TI LLs provided by Eircom competitors depended on the use of wholesale inputs supplied by Eircom.

⁴⁶⁹ BT has a market share of less than \times [REDACTED].

⁴⁷⁰ Greater than 10%.

⁴⁷¹ BT's response to ComReg's Qualitative Questionnaire.

⁴⁷² Absent regulation.

⁴⁷³ See page 86 of the Oxera Report.

⁴⁷⁴ Over 60%.

6.29 Thus, given the general decline in demand for Low Bandwidth TI WHQA LLs provided by all SPs, ComReg does not consider it probable that, within the lifetime of this review, Eircom's existing competitors will increase the supply of such services. As a consequence, Eircom's market share is unlikely to fall close to or below 50% over the duration of this review.

Pricing Behaviour

6.30 The development and extent of competition in a market over time may be evident in the pricing of Low Bandwidth TI WHQA products, services and facilities. In an SMP assessment, the ability of a SP to behave, to an appreciable extent, independently of the pricing behaviour of its competitors may be suggestive (but not determinative in itself) of SMP when considered alongside other factors. In view of this, ComReg has reviewed trends in Low Bandwidth TI WHQA pricing over time.

6.31 Eircom's wholesale prices for Low Bandwidth TI WHQA products are regulated by ComReg and it is ComReg's view that the WHQA price reductions that have occurred over the last number of years have primarily arisen from intermittent reviews by Eircom of the inputs (such as costs and volumes) feeding into the cost-model which is used to derive regulated prices (rather than arising from competitive constraints arising in the Low Bandwidth TI WHQA Market).

6.32 Furthermore, given the lack of effective existing competition in the Low Bandwidth TI WHQA Market it is ComReg's preliminary view that, absent regulation, Eircom has both the ability and incentive⁴⁷⁵ to increase prices (above the competitive level) offered/charged to Access Seekers for Low Bandwidth TI WHQA LLs. ComReg's preliminary view is also that Eircom would not be likely to have reduced the price of Low Bandwidth TI WHQA LLs, but for the existence of regulation.

6.33 In light of the above, there is no firm behavioural evidence to suggest that Eircom is facing effective pricing constraints in the provision of Low Bandwidth TI WHQA LLs.

Other factors relevant to existing competition in the Low Bandwidth TI WHQA Market

6.34 Other factors considered by ComReg include vertical integration, relative strength of existing competitors, barriers to expansion and indirect constraints.

⁴⁷⁵ These abilities and incentives are discussed in Section 7 dealing with competition problems.

Vertical Integration

- 6.35 A vertically integrated operator can enjoy significant efficiencies arising from its presence in upstream and downstream markets. Such efficiencies can also be passed on to end-users in the form of more competitive prices, lower transaction costs and/or enhanced product quality. However, vertical integration can also constitute an entry barrier where the presence of a firm at multiple levels of the production or distribution chain raises the costs of new entry (for example, where prospective new entrants perceive the need to enter multiple markets simultaneously to pose a viable competitive constraint on the vertically integrated operator) and/or increases the possibilities for the integrated operator to foreclose competition at one or more levels in the value chain, the threat of which could in turn act as a disincentive to new entry.
- 6.36 As well as being the largest LB TI WHQA supplier, Eircom is also a significant provider of retail LB TI LLs.⁴⁷⁶ As such, Eircom's significant customer base in the retail market is likely, at this point in time, to consolidate its market power in the LB TI WHQA Market.
- 6.37 As a supplier of LB TI WHQA and retail LB TI LLs, Eircom may also have incentive to raise the cost to its rivals supplying retail services (and other services) by, for example, applying excessive prices.⁴⁷⁷
- 6.38 Eircom's vertically integrated structure also mitigates the extent to which Eircom is dependent on its LB TI WHQA revenue.⁴⁷⁸ As such, absent regulation, Eircom could potentially seek to maximize its total profits by increasing LB TI WHQA prices (or indeed refusing access to LB TI WHQA) and, in doing so, seek to foreclose competition in the LB TI retail LL market.
- 6.39 Figure 29 above illustrates that the majority of Eircom's competitors in the LB TI Retail Market rely on Eircom's LB TI WHQA services when competing for end-users purchasing retail LB TI LL.
- 6.40 Having regard to the above, ComReg's preliminary view is that Eircom's vertically integrated structure could enhance Eircom's suggested SMP position in the LB TI WHQA Market by allowing it to behave, to an appreciable extent, independently of its competitors, customers and consumers (and by potentially increasing barriers to entry by, for example, requiring an entrant to enter multiple vertically-related markets concurrently).

⁴⁷⁶ See Appendix: 4 for details of Eircom's market share in various retail markets.

⁴⁷⁷ See further discussion of the potential for Eircom to apply excessive prices in Section 7 of this Consultation.

⁴⁷⁸ See further discussion of this impact under the countervailing buyer power section in paragraphs 6.69 to 6.94 below.

Strength of Existing Competitors

6.41 As noted in Figure 29 above, Eircom has a market share in the LB TI WHQA Market more than six times as large as its nearest competitor. As such, no existing alternative SP has a market share that would suggest it is capable of exercising a sufficient competitive constraint on Eircom.

Barriers to Expansion

6.42 ComReg's preliminary view is that as the LB TI WHQA Market is declining with trivial numbers of new circuits being ordered, there is no incentive for alternative SPs to invest in expanding their infrastructure in this market as any such investment is likely to be stranded⁴⁷⁹.

Indirect Constraints

6.43 As noted in 5.175 above, all SPs providing on-net LB TI retail LLs also supply LB TI WHQA. As such, indirect constraints are not a consideration for either market definition or SMP assessment in the LB TI WHQA market.

Preliminary Conclusion on Existing Competition

6.44 Having regard to ComReg's assessment in paragraphs 6.26 to 6.43 above, ComReg's preliminary view is that, absent regulation in this market, it is unlikely that Eircom would be sufficiently constrained by existing competition such that it would prevent Eircom from behaving, to an appreciable extent, independently of competitors, customers and consumers.

6.45 This is due to Eircom's persistently high and growing market shares in a declining market, the lack of effective indirect pricing constraints and no notable evidence of competition materially impacting Eircom's pricing behaviour, all of which is suggestive of Eircom having SMP in the Low Bandwidth TI WHQA Market. Below, ComReg considers other relevant factors (potential competition and CBP) which may have the effect of diminishing or undermining Eircom's suggested SMP position in the low bandwidth WHQA Market.

Potential Competition in the Low Bandwidth TI WHQA Market

6.46 Noting the absence of an effective competitive constraint posed by existing competition, ComReg now assesses the likely effectiveness of any constraints likely to be posed by potential competition in the Low Bandwidth TI WHQA Market.

⁴⁷⁹ For further information, see paragraphs 6.53 to 6.54 below.

- 6.47 This assessment considers whether entry (and expansion) in the Low Bandwidth TI WHQA Market is sufficiently likely, timely, and credible to such an extent that it would effectively constrain Eircom's ability to act independently of its competitors, customers and consumers over the medium term⁴⁸⁰.
- 6.48 In considering constraints posed by potential competition, ComReg first examines the barriers to entry and expansion insofar as they may impact upon the effectiveness of the constraints posed by potential competitors. Then, ComReg assessed the strength of any such potential competition having regard to the barriers to entry and expansion that have been identified.



Barriers to Entry and Expansion

- 6.49 In assessing the likelihood of potential competition to act as an effective constraint on Eircom over the period of this review, ComReg has examined the nature and extent of any barriers to firms both entering and/or subsequently expanding in the Low Bandwidth TI WHQA Market.
- 6.50 Barriers to entry generally comprise any disadvantage that a new entrant faces when entering a market that incumbents do not currently face. According to the Explanatory Note to the 2014 Recommendation:⁴⁸¹

"...high structural barriers may be found to exist when the market is characterised by absolute cost advantages, substantial economies of scale and/or economies of scope, capacity constraints, and high sunk cost. Such barriers can be found in sectors that rely on the deployment of networks, such as fixed networks for electronic communications."

- 6.51 Barriers to growth and expansion are obstacles that a new entrant (or smaller existing competitor) faces in its ability to grow or expand in a particular market, and which limit its ability to assert an effective competitive constraint over the medium to longer term.
- 6.52 Assessing the barriers to entry and expansion involves initially identifying what represents credible entry into the LB TI WHQA Market. In order to provide an effective competitive constraint, a potential entrant must provide a product that at least meets the characteristics of the WHQA products, services and facilities set out in Section 5 (thereby meeting the expectations of Access Seekers).

Low Bandwidth TI WHQA Market is in slow decline

- 6.53 As evidenced in Figure 29, the number of Low Bandwidth TI WHQA (and associated retail LLs) is in steady decline. In 2013 there were 9,261 such circuits in operation. By 2015, this had decreased to 5,754 – a decrease of 37% over three years. Furthermore, this demand is almost exclusively legacy, with only   new Low Bandwidth TI WHQA LLs sold by Eircom in 2016.

⁴⁸⁰ See paragraph 74 of the European Commission's SMP Guidelines.

⁴⁸¹ Explanatory Note to 2014 Recommendation, page 9.

- 6.54 ComReg considers it likely that this market will continue to decline over the duration of the review, however, the pace of this decline is likely to be slower given reductions to date have been impacted by bulk type circuit reductions which have now occurred. As such, in ComReg's view, there is likely to be insufficient potential demand to incentivise an SP to invest in infrastructure to provide Low Bandwidth TI WHQA in the future.

Adapting an Existing Network to Provide LB TI WHQA

- 6.55 ComReg has considered the extent to which potential entry in the Low Bandwidth TI WHQA Market by an existing vertically integrated SP adapting its network would be likely to occur over the period of this market review and effectively constrain Eircom's suggested SMP position.
- 6.56 The barriers to entry present in the WHQA Markets may be lessened, in part, if a potential entrant has an existing network that is used to provide other services and could be leveraged to also provide WHQA services.
- 6.57 Relative to a 'Greenfield' entrant, an existing vertically integrated SP seeking to enter the Low Bandwidth TI WHQA Market could face reduced sunk costs, particularly those relating to the upfront civil costs involved in building a network. An existing SP also has an existing customer base over which it may, through cross-selling, more easily recover entry costs, and may be better placed to achieve economies of scale, scope, and density relative to a 'new build' Greenfield entrant.
- 6.58 However, ComReg does not consider it likely that entry by an existing SP through adapting its network would be likely to occur over the period of this review having regard to the slow decline in this market and the uncertainty this creates about the ability for an SP to recover any investment (which would be largely sunk and stranded).

Potential Low Bandwidth TI WHQA entry by existing MI WHQA providers

- 6.59 In paragraphs 5.169 to 5.173 ComReg explained that it was of the preliminary view that supply-side substitution is likely to be limited due to the existence of significant fixed costs associated with the change of electronic equipment required to deliver TI WHQA services. Moreover, it is likely to be inefficient for MI WHQA SPs to begin supplying TI WHQA services as the demand for these services is in decline and thus, the required investments are unlikely to be recovered.
- 6.60 The Oxera Report⁴⁸² also notes that there are barriers to entry in the Low Bandwidth TI WHQA Market associated with the ubiquity of Eircom's copper network as well as the presence of economies of scale and scope since TDM infrastructure can also be used to deliver voice services.

⁴⁸²Section 9.3.3 The Oxera Report

- 6.61 It should also be noted that none of the respondents to ComReg's Qualitative Questionnaire indicated that they are considering launching new TI WHQA services over the period of this market review. In this regard, BT noted that:

“



”

- 6.62 For these reasons, and due to the general decline in demand for TI LL by retail end-users (from which TI WHQA demand is derived), ComReg considers it unlikely that entry into the Low Bandwidth TI WHQA Market by MI WHQA SPs will be likely to occur over the period of this review. In fact, due to the decline in demand, market exit is a more likely development over the duration of this review.

Using LLU inputs to offer Low Bandwidth TI WHQA services

- 6.63 As noted in paragraph 4.9 to 4.57, BT, Digiweb and Magnet are already using LLU inputs to provide retail and/or wholesale EFM services (albeit in low numbers). Thus, potential entrants could enter the Low Bandwidth TI WHQA Market by purchasing these upstream products over the period of this market review.
- 6.64 However, the overall take-up of LLU products remains relatively low. As of Q1 2016, there were 62,523 LLU lines of which 51,847 were Line Share (which are not related to any EFM service) and 10,676 were Fully Unbundled lines⁴⁸³. Given the low demand to date, ComReg does not consider it likely that the use of LLU inputs by SPs to offer Low Bandwidth TI WHQA LLs would act as an effective competitive constraint over the period of this review.⁴⁸⁴
- 6.65 ComReg also considers that a SP attempting to enter or expand in the LB TI WHQA Market using LLU would be likely to face many of the same barriers to entry faced by 'Greenfield entrants', including:
- (a) the WHQA entrant would be unlikely to benefit from the same economies of scale to those enjoyed by the incumbent WHQA supplier, thus making it more difficult to compete with the incumbent WHQA supplier; and

⁴⁸³ Quarterly Key Data Report, Q1 2016. It should also be noted that the number of LLU lines is in decline in recent quarters (20.9% annual decline as of Q1 2016).

⁴⁸⁴ However, ComReg will keep this under review and revisit this analysis and/or adjust any remedies as appropriate should this change materially.

- (b) the entrant would be likely to face significant sunk costs in attempting to replicate (even to a lesser scale) the WHQA service using LLU inputs. These would include the costs associated establishing backhaul networks, unbundling exchanges (or upgrading equipment in existing unbundled exchanges), and costs associated with developing WHQA services as well as billing and order management systems.

6.66 For these reasons, ComReg considers it unlikely that entry into the TI WHQA Market using LLU products will occur over the period of this review to an extent that would pose an effective competitive constraint on Eircom in the provision of WHQA.

Preliminary Conclusion on Potential Competition in the LB TI WHQA Market

6.67 In paragraphs 6.46 to 6.66 ComReg has considered the extent to which potential competition would, over the period of this market review, be likely to effectively constrain Eircom's behaviour in the Low Bandwidth TI WHQA Market such that it would mitigate Eircom's suggested SMP position in LB TI WHQA Market. Overall, ComReg's preliminary view is that absent regulation in this market, it is unlikely that Eircom would be sufficiently constrained by potential competition such that it would prevent Eircom from behaving, to an appreciable extent, independently of competitors, customers and consumers.

6.68 ComReg considers that alternative independent network operators would be unlikely to enter the Low Bandwidth TI WHQA Market over the period of this review given the declining demand. As such, ComReg considers that existing alternative independent network operators would be unlikely to exert a sufficient competitive constraint on Eircom in the Low Bandwidth TI WHQA Market.

Countervailing Buyer Power

6.69 Below, ComReg considers whether bargaining power on the buyer side of the Low Bandwidth TI WHQA Market is likely to impose a sufficiently effective competitive constraint on Eircom, such that it would credibly offset Eircom's suggested power to behave, to an appreciable extent, independently of competitors, customers and ultimately consumers.

6.70 In so doing, ComReg examines whether sufficient countervailing buyer power ('**CBP**')⁴⁸⁵ exists such that it results in Eircom not being able to sustain Low Bandwidth TI WHQA prices that are above the competitive level, i.e. the effective exercise of CBP is one which results in such WHQA prices being constrained to the levels that would be achieved in a competitive market outcome.

⁴⁸⁵ The existence of some level of CBP would not, in itself, be sufficient. Rather, it must be sufficiently strong such that it results in WHQA pricing being prevented from rising above a level that would pertain in a competitive market outcome.

Overview of Framework for CBP Assessment

6.71 Below ComReg sets out the framework for the CBP assessment.

Necessary Conditions for Effective CBP

6.72 The effectiveness of CBP is likely to be significantly dependent on the strength of the bargaining power of the purchaser in its WHQA negotiations. The European Commission's 2009 enforcement priorities in applying Article 102 of the Treaty of the Functioning of the European Union to abusive exclusionary conduct by dominant undertakings⁴⁸⁶ (the '**2009 Enforcement Priorities**') are informative on the issue of CBP in competition assessments. These state⁴⁸⁷ that:

“Competitive constraints may be exerted not only by actual or potential competitors but also by customers. Even an undertaking with a high market share may not be able to act to an appreciable extent independently of customers with sufficient bargaining strength. Such countervailing buying power may result from the customers' size or their commercial significance for the dominant undertaking, and their ability to switch quickly to competing suppliers, to promote new entry or to vertically integrate, and to credibly threaten to do so. If countervailing power is of a sufficient magnitude, it may deter or defeat an attempt by the undertaking to profitably increase prices. Buyer power may not, however, be considered a sufficiently effective constraint if it only ensures that a particular or limited segment of customers is shielded from the market power of the dominant undertaking.”

6.73 In its Horizontal Mergers Guidelines⁴⁸⁸, the European Commission also notes that:

“Countervailing buyer power should be understood as the bargaining strength that the buyer has vis-à-vis the seller in commercial negotiations due to its size, its commercial significance to the seller and its ability to switch to alternative suppliers.”

6.74 In light of the above, it is ComReg's view that effective CBP results from buyers/customers that:

- Account for a significant proportion of the supplier's total output;
- Are well-informed about credible alternative sources of supply; and

⁴⁸⁶ Communication from the Commission — Guidance on the Commission's enforcement priorities in applying Article 82 of the EC Treaty to abusive exclusionary conduct by dominant undertakings (2009/C 45/02). Available at <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:C:2009:045:0007:0020:EN:PDF>.

⁴⁸⁷ Paragraph 18 of the 2009 Enforcement Priorities.

⁴⁸⁸ European Commissions “Guidelines on the assessment of horizontal mergers under the Council Regulation on the control of concentrations between undertakings”, [Official Journal C 31, 05.02.2004](#), para 64, (the '**Horizontal Mergers Guidelines**').

- Are able to switch to other suppliers at little cost to themselves, or to self-supply the relevant product relatively quickly and without incurring substantial sunk costs.
- 6.75 It is also of note that effective CBP is that which has a broader market impact and not that which only results in a limited segment of customers benefiting from better terms and conditions.

Impact of Regulation on CBP Assessment

- 6.76 In carrying out an assessment of CBP it is also necessary to consider the impact of existing or future potential regulation and, in this regard, ComReg sets out its approach to the treatment of:
- (a) existing SMP regulation in the Relevant WHQA Markets, being the markets within which prospective SMP is now being assessed; and
 - (b) existing SMP regulation in markets other than the Relevant WHQA Markets.

Existing SMP Regulation

- 6.77 Insofar as existing SMP regulation in the Relevant WHQA Markets is concerned, ComReg has already noted that throughout this analysis it adopts the European Commission's Modified Greenfield Approach⁴⁸⁹, whereby SMP regulation in the market under consideration is discounted when considering the prospective SMP analysis of the Relevant WHQA Markets.
- 6.78 In the context of the assessment of the existence of any effective CBP, ComReg considers the potential bargaining outcomes in the absence of Eircom having been designated with SMP (or being potentially designated with SMP) and absent SMP obligations being imposed on it. This is to avoid drawing conclusions regarding the competitive structure of a particular market which may be influenced by, or indeed premised on, existing or potential regulation on that market. Considering how the Relevant WHQA Markets may function absent regulation helps to ensure that regulation is only applied (or withdrawn) in those circumstances where it is truly justified and proportionate. To do otherwise could result in a circularity of argument whereby, for example, the Low Bandwidth TI WHQA Market is found to be effectively competitive (or not) only by virtue of constraints arising from existing or potential SMP obligations. Once found then to be effectively competitive, SMP obligations would be withdrawn in the Low Bandwidth TI WHQA Market, thereby undermining the original finding of effective competition within those markets.

⁴⁸⁹ See paragraph 5.12.

SMP Regulation in markets other than the Relevant WHQA Markets

- 6.79 The bargaining position of an undertaking with SMP obligations in markets other than the LB TI WHQA Market is likely to be somewhat weakened in any negotiations regarding WHQA. In this respect, Eircom is designated with having SMP in a number of regulated markets⁴⁹⁰ and has SMP obligations imposed upon it in these markets.
- 6.80 As a consequence, this somewhat weakens its bargaining position insofar as it limits the credibility of, for example, threats of increased wholesale prices in those markets – but not the credibility of threats of price increases in the LB TI WHQA Market.
- 6.81 In light of the above, it is ComReg’s preliminary view that Eircom’s Low Bandwidth TI WHQA customers’ positions in these markets in the presence of regulation is not likely to strengthen its bargaining power in its negotiations with SPs, in particular, given that its SMP position in such markets undermines the credibility of any threat to retaliate by, for example, imposing price increases or denying access to wholesale services provided in these markets.

CBP Assessment in the Low Bandwidth TI WHQA Market

- 6.82 As noted in paragraph 6.74, the circumstances where CBP might be observed to act as an effective competitive constraint are where buyers/customers:
- (a) account for a significant proportion of the supplier’s total output;
 - (b) are well-informed about credible alternative sources of supply; and
 - (c) are able to switch to other suppliers at little cost to themselves, or to self-supply the relevant product relatively quickly and without incurring substantial sunk costs.
- 6.83 The above factors are considered below (note that (b) and (c) are considered together), along with any evidence of effective CBP being exercised in negotiations between Eircom and Access Seekers.

Size of the Buyer and its Relative Importance to the Seller

- 6.84 The strength of CBP can be influenced by the relative size of the buyer, with this being measured according to the buyer’s share of relevant WHQA LLs purchased from the SP (in this case, Eircom) relative to total purchases of WHQA LLs from the same SP. The degree to which high shares of WHQA purchases are concentrated amongst one or more buyers could also be relevant.

⁴⁹⁰ This includes Retail Access to the Public Telephone Network at a Fixed Location, Fixed Voice Call Termination (‘**FVCT**’), Fixed Access and Call Origination (‘**FACO**’), Mobile Voice Call Termination (‘**MVCT**’) (through Eircom group Mobile), Wholesale Broadband Access (‘**WBA**’) Market and Wholesale Physical Network Infrastructure Access (‘**WPNIA**’) Market.

- 6.85 In the Low Bandwidth TI WHQA Market Eircom's retail business with a \times [REDACTED]⁴⁹¹ market share of low bandwidth TI LL purchases is, by a significant margin, the largest purchaser. BT has a \times [REDACTED]⁴⁹² market share of overall Low Bandwidth TI WHQA sales and is the largest third-party purchaser of Low Bandwidth TI WHQA products from Eircom. The remaining shares of WHQA purchases are split amongst a number of smaller Access Seekers (in terms of purchases).
- 6.86 Therefore, while one Access Seeker represents a relatively sizeable proportion of Eircom's LB TI WHQA sales, Eircom is a vertically integrated SP that earns most of its revenue from supplying retail services. Eircom is not, therefore, solely reliant on LB TI WHQA revenues. Indeed, absent regulation, it is ComReg's preliminary view that LB TI WHQA Access Seekers' subscribers would likely purchase retail services from Eircom. Assuming that Eircom's retail division is profitable, then Eircom would be likely to increase its profitability and revenue by gaining a retail customer at the expense of LB TI WHQA revenue.
- 6.87 Having regard to the above, ComReg's preliminary view is that while, BT is the largest external purchaser of Low Bandwidth TI WHQA from Eircom, this is not likely to strengthen its bargaining position as any dependency by Eircom on wholesale revenues earned from BT could be largely converted to retail revenues through foreclosing access to BT to the LB TI WHQA and so gaining the retail demand currently being met by BT.

Credible Alternative Sources of Supply

- 6.88 As noted in paragraph 6.27, Eircom is the largest supplier of LB TI WHQA and Access Seekers purchasing such products have limited options for switching to another supplier⁴⁹³. In this respect, we note that despite BT being able to supply Low Bandwidth
- 6.89 WHQA LLs on-net, it nonetheless buys a significant portion of such lines from Eircom, thereby suggesting its own self-supply is insufficient to fulfil its downstream demand. As noted previously, Eircom's competitors in MI WHQA Market are unlikely to enter the LB TI WHQA Market given that the majority of new orders is for MI LLs. Thus, ComReg has set out its preliminary view above that effective potential competition in the LB TI WHQA Market is not likely to emerge within the period of this market review.

⁴⁹¹ Greater than 65%.

⁴⁹² Less than 20%.

⁴⁹³ Given \times [REDACTED] are the largest consumers of Eircom's LB TI WHQA products and that these are relatively large organisations having significant experience of operating within electronic communications markets, they are likely to be reasonably well informed about alternative sources of supply, were they to exist.

6.90 Access Seekers therefore, rely on Eircom's LB TI WHQA services to provide retail services to their customers, and in the absence of regulation, are unlikely to be in a position to credibly threaten to respond to changes in Eircom's commercial terms and conditions by seeking an alternative source of supply. As discussed throughout this section, in response to a WHQA price increase by Eircom, barriers to entry would be likely to inhibit Access Seekers from switching to self-supplied LB TI WHQA LLs in response.

Evidence of bargaining power from operator negotiations

6.91 ComReg has considered whether effective CBP being exercised is evident from bargaining in WHQA negotiations between Eircom on the one hand and Access Seekers on the other. In this respect, in paragraphs 6.30 to 6.33 ComReg examined Eircom's LB TI WHQA pricing behaviour and set out its view that there is no firm behavioural evidence to suggest that Eircom is facing effective pricing constraints in the provision of LB TI WHQA services. This also suggests that effective CBP has not been or is likely to be a relevant factor in constraining Eircom's behaviour in the Low Bandwidth TI WHQA Market.

6.92 ComReg also notes that as part of the assessment of CBP, ComReg sought the views of SPs currently supplying LL services in Ireland as to whether their wholesale customers are able to meaningfully influence the price, quality, and other conditions of supply of their WHQA services.

6.93 In general, respondents noted that larger wholesale customers tend to negotiate with suppliers of WHQA services on prices and SLAs. For example, SPs may apply volume based discounts in some instances. However, ComReg notes that this was primarily in relation to MI WHQA LLs and not relevant to TI WHQA LLs.

Preliminary Conclusion on CBP Assessment in Low Bandwidth TI WHQA Market

6.94 Having regard to the analysis in paragraphs 6.69 to 6.93 above, ComReg's preliminary view is that it is unlikely that Eircom would be sufficiently constrained by CBP such that it would prevent it from behaving, to an appreciable extent, independently of competitors, customers and consumers.

Proposed Designation of Eircom with Significant Market Power in the LB TI WHQA Market

6.95 In paragraphs 6.25 to 6.94 above, ComReg has considered a wide range of factors to identify whether any undertaking enjoys a position of SMP in the LB TI WHQA Market. These factors have included:

- Existing competition in the Low Bandwidth TI WHQA Market;
- Potential competition in Low Bandwidth TI WHQA Market; and
- The strength of any CPB.

- 6.96 ComReg's preliminary view is that the Low Bandwidth TI WHQA Market is not likely to be effectively competitive and that Eircom would not be sufficiently constrained by the above factors such that it would prevent it from behaving, to an appreciable extent, independently or competitors, customers and consumers.
- 6.97 Where ComReg determines, as a result of a market analysis carried out by it in accordance with Regulation 27 of the Framework Regulations, that a given market identified in accordance with Regulation 26 of the Framework Regulations is not effectively competitive, ComReg is obliged to designate one or more undertaking under Regulation 27(4) of the Framework Regulations as having significant market power.
- 6.98 Having regard to the preliminary conclusions above, ComReg is of the preliminary view that Eircom should be designated as having SMP in the Low Bandwidth TI WHQA Market.

Assessment of Competition in the High Bandwidth TI WHQA Market

- 6.99 In assessing competition in the HB TI WHQA Market, ComReg adopts the same analytical framework as outlined above for the HB TI WHQA Market.

Existing Competition in the High Bandwidth TI WHQA Market

Market shares in the High Bandwidth TI WHQA Market

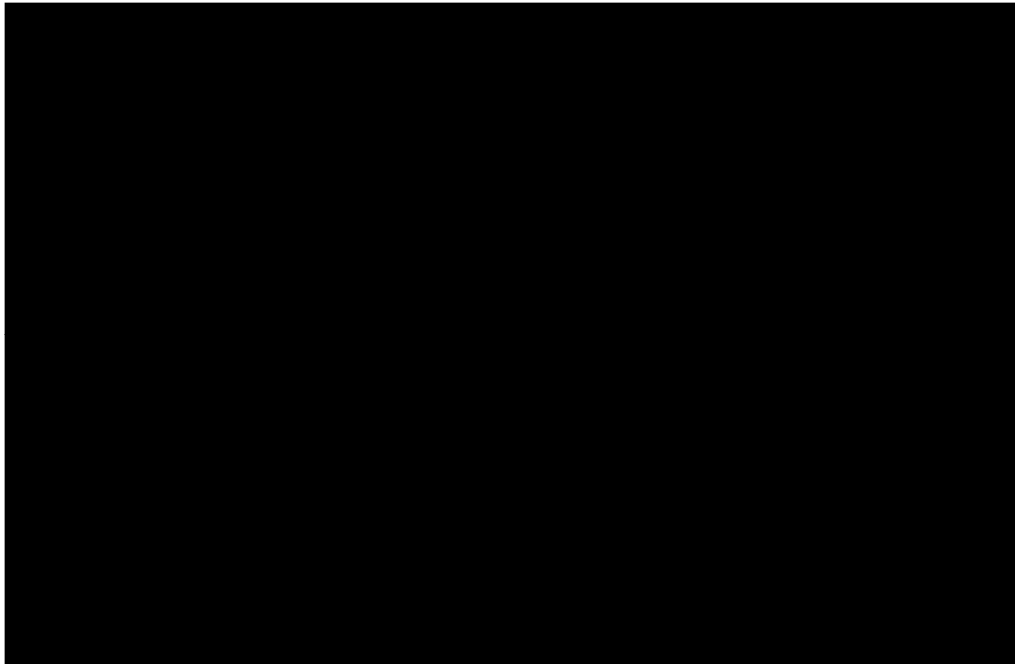
- 6.100 Before examining market shares it is worth noting that the total number⁴⁹⁴ of LLs in this market at the end of 2015 is relatively low (in comparison to the High Bandwidth TI WHQA Market and the MI WHQA Market) having fallen from ✂ [REDACTED] in 2013 to ✂ [REDACTED] in 2015 (a decline of 23%). This decline is likely to be due, in part, to end-users migrating over time to MI WHQA services. Moreover, ComReg notes that there is almost no new demand for High Bandwidth TI WHQA LLs with only ✂ [REDACTED]⁴⁹⁵ circuits ordered from ✂ [REDACTED] in 2015. These High Bandwidth TI WHQA volumes suggest that this market is in terminal decline and it is highly questionable whether it is a market that is likely to be capable of or worthy of monopolisation (given, for example, any extra profits through attempted monopolisation are likely to be relatively low).

⁴⁹⁴ The number is less than 400.

⁴⁹⁵ The number is less than 10.

6.101 Nevertheless, Figure 30 shows the hypothetical market shares absent regulation⁴⁹⁶ in the High Bandwidth TI WHQA Market for the period 2013 to 2015. It illustrates that BT is the largest provider of services in this market with a market share of \times [REDACTED]⁴⁹⁷ as of 2015 having been relatively stable since 2013. Eircom's hypothetical market share at the end of 2015 was \times [REDACTED]⁴⁹⁸ having declined by \times [REDACTED] since 2013.

Figure 30: Hypothetical Market Shares – High Bandwidth TI WHQA Market
 \times [REDACTED]



6.102 Thus, ComReg does not consider it likely that within the lifetime of this market review the market share of any SP is likely to rise close to or above 50%. Even if a SP's market share were to exceed 50%, the High Bandwidth TI WHQA Market is in decline and is unlikely to be worthy of monopolisation given the continuing decline for High Bandwidth TI LLs, the small relative size of the market, and a degree of asymmetric substitution between this market and the MI WHQA Market.

6.103 Given the low and declining volumes in this market, coupled with the fact that no SP has a market share of over 50%, and the fact that suitable, cheaper alternatives are available, ComReg is of the preliminary view that even based on an assessment of existing competition, no SP is likely to have SMP and that continued regulation of this market is not proportionate or justified.

⁴⁹⁶ Hypothetical shares absent regulation refers to the On-net supply at both the retail and wholesale level.

⁴⁹⁷ Less than 50%.

⁴⁹⁸ Less than 30%.

Potential Competition in the High Bandwidth TI WHQA Market

6.104 Given the decline in the High Bandwidth TI WHQA Market noted above, ComReg does not consider that there will be any potential competition in this market. It is more likely than not that over the period covered by this review that LL volumes will decline further thereby undermining any potential entry and investment by SPs in this market.

CBP Assessment in the High Bandwidth TI WHQA Market

6.105 Given the decline in the High Bandwidth TI WHQA Market noted above, ComReg does not consider that a CBP assessment could meaningfully be employed in the analysis.

Overall Preliminary Conclusions on Significant Market Power in the High Bandwidth TI WHQA Market

6.106 In paragraphs 6.99 to 6.105 above, ComReg has considered a number of factors to identify whether any undertaking enjoys a position of SMP in the High Bandwidth TI WHQA Market. These factors have included:

- existing competition in the High Bandwidth TI WHQA Market;
- potential competition in High Bandwidth TI WHQA Market;
- the strength of any CPB; and
- that this market is in terminal decline and that it is not likely to be capable of or worthy of monopolisation.

6.107 ComReg's preliminary view is that no SP is likely to have SMP in the High Bandwidth TI WHQA Market.

Assessment of Competition in the MI WHQA Market

6.108 In this section ComReg presents its preliminary views on the assessment of competition and SMP in the MI WHQA Market, in particular,

- (a) existing competition in the MI WHQA Market is discussed in paragraphs 6.111 to 6.130;
- (b) potential competition in the MI WHQA Market is discussed in paragraphs 6.131 to 6.134; and
- (c) CBP in the MI WHQA Market is discussed in paragraphs 6.135 to 6.140.

6.109 ComReg is of the preliminary view that the evidence of existing and potential competition indicates that it is unlikely that any SP has SMP in the MI WHQA Market and that this is likely to remain the case over the lifetime of this review.

Existing Competition in the MI WHQA Market

6.110 Below ComReg examines factors such as market shares, vertical integration, the relative strength of existing competitors, barriers to expansion, indirect constraints, and pricing behaviour.

Market shares in the MI WHQA Market

6.111 As noted in paragraph 6.113 above, ComReg's market share estimation in the MI WHQA Market is based on the count of single end physical LLs sold by SPs. However, to ensure the robustness of conclusions, market shares in terms of double-end physical LLs as well as market shares in terms of logical and single-end physical LLs were also estimated. These market shares are presented in Appendix: 4 below.⁴⁹⁹ As indicated in paragraphs 5.20 to 5.24 above, self-supply to retail arms of vertically integrated WHQA SPs are included in market share estimations, while Eircom's self-supply to its mobile arm and Tetra as well as MNOs supply of LL connectivity to their own downstream mobile operations is excluded from market share estimations as such supply is considered to be captive.

6.112 Figure 31 below shows the hypothetical absent regulation market shares for single-ended physical LLs in the MI WHQA Market in the period 2013 to 2015.

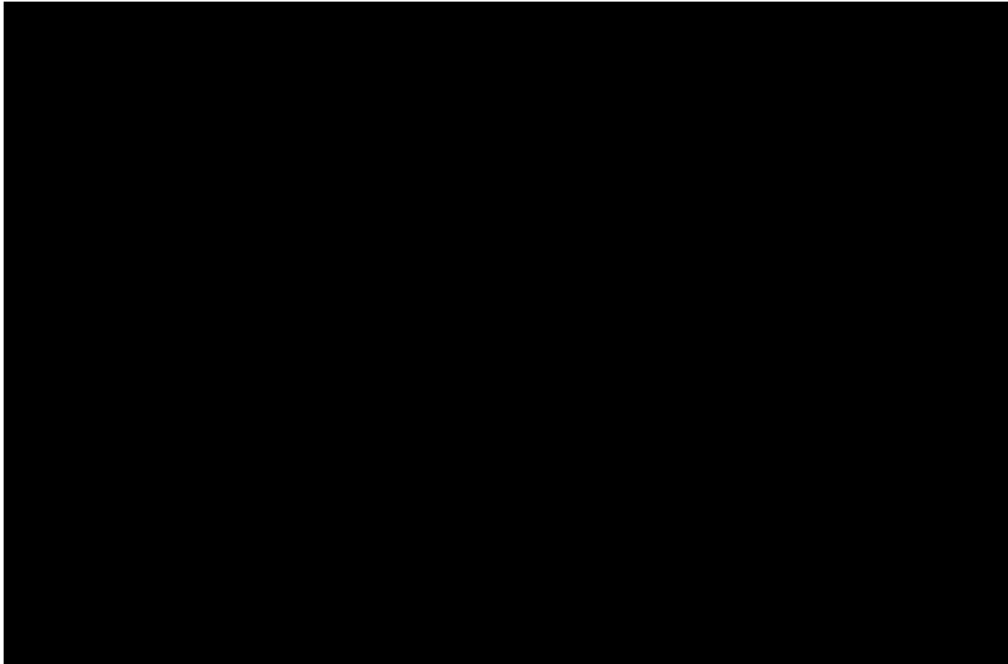
6.113 It illustrates that Eircom, the SP with the largest market share, had a market share at the end of 2015 of \times [REDACTED]⁵⁰⁰ although it has increased slightly since 2013. Nevertheless, Eircom's Market shares remained below 35% during this period.

6.114 Figure 31 also illustrates that there are a number of other SPs who held market shares above 10% including BT \times [REDACTED], enet \times [REDACTED] and Airspeed \times [REDACTED]. Moreover, changes in market shares indicate some churn in supply in a market that increased in volume by approx. 33% in the last three years.

⁴⁹⁹ Looking at counts of logical circuits, Eircom has a market share of \times [REDACTED] in 2015 and for double-ended circuits has a market share of \times [REDACTED] %.

⁵⁰⁰ Less than 40%.

Figure 31: Hypothetical Market Shares MI WHQA Market – method 2, single physical count of circuits ✂[REDACTED]



- 6.115 There is a mix of wholesale only SPs with national urban coverage such as enet, along with SPs that specialise in the supply of MI WHQA LLs over P2P radio links such as Digiweb.
- 6.116 As indicated in paragraph 3.4 above and highlighted in Table 1, all of Eircom's main competitors for the supply of MI WHQA LLs have their own wired or wireless network infrastructure, many with a wide geographic coverage. While the ubiquity of Eircom's network has not been replicated by any competitor, Airspeed's, BT's, Digiweb's, enet's, Three's and Vodafone's networks are assumed to be quasi national as they have established POPs in all provinces and many of the regional centres. Network coverage maps presented in Appendix: 11 further illustrate the geographic reach of alternative networks.
- 6.117 Again, of particular importance is the State owned MAN network operated by Enet where wholesale access to 94 urban centres is available. Furthermore, SPs providing MI WHQA LLs over P2P radio links are also an important source of supply with a collective ✂ [REDACTED]⁵⁰¹ market share.

⁵⁰¹ Less than 25%.

- 6.118 The strength of Eircom's competitors is also demonstrated by the relatively low dependency on Eircom's MI WHQA LL inputs for the provision of retail and/or wholesale LL services as indicated in Tables 8.3 and 8.4 of the Oxera Report⁵⁰². Overall, only \times [REDACTED]⁵⁰³ of retail MI services provided by Eircom's competitors depended on wholesale inputs from Eircom at the end of 2015. In the wholesale market, the corresponding figure is \times [REDACTED]⁵⁰⁴.
- 6.119 As noted in paragraph 5.212 above, ComReg also undertook a deeper geographic analysis to ascertain if the conditions of competition were sufficiently heterogeneous to warrant the delineation of separate geographic MI WHQA markets. This analysis, summarised in Figure 28 above indicates that although there are differences in market shares and the strength/presence of SPs inside and outside of these Business Parks, ComReg's preliminary view was that they are not sufficiently different to warrant the identification of separate geographic markets.
- 6.120 Moreover, even if separate markets were to be considered, no SP in either such separate markets would have a market share sufficiently large to be suggestive of it having SMP.
- 6.121 Furthermore, as noted in paragraph 6.118 the overall reliance by SPs on Eircom for circuit completion at both the wholesale and retail level for MI WHQA LLs is relatively low.

Other factors relevant to existing competition in the MI WHQA Market

- 6.122 Other factors considered by ComReg include vertical integration, relative strength of existing competitors, barriers to expansion, indirect constraints, and pricing behaviour.

Vertical Integration

- 6.123 The concept of vertical integration is set out in paragraph 6.35. In relation to the MI WHQA market, there are many vertically integrated SPs operating at both the wholesale and retail level. As such, it is ComReg's preliminary view that no SP is in a position where it is likely to be able to leverage its vertically integrated position to the detriment of competition in either the MI WHQA or retail MI LL markets.

Strength of Existing Competitors

- 6.124 As can be seen from Figure 31 above, there are four SPs with market shares over 10% and no SP has a market share in excess of 30%. As such, it is ComReg's preliminary view that there is no SP that enjoys a market position that is sufficiently strong as to not be competitively constrained by its rivals.

⁵⁰² See page 85 and 86 of the Oxera Report.

⁵⁰³ Less than 15%.

⁵⁰⁴ Less than 15%.

Barriers to Expansion

6.125 ComReg considers Barriers to Expansion alongside Barriers to Entry in the context of potential competition below in paragraphs 6.131 to 6.134 below.

Indirect Constraints

6.126 As noted in paragraph 6.114 above, all SPs providing on-net retail MI LLs also supply MI WHQA. As such, indirect constraints are not a consideration for either market definition or SMP assessment in the MI WHQA market.

Pricing Behaviour

6.127 As can be seen from Figure 29 above, there is a degree of churn in the market shares of SPs providing MI WHQA. Furthermore, 4 SPs stated that pricing was competitive at the Wholesale Level.⁵⁰⁵ Moreover at the retail level, [REDACTED] stated that prices were [REDACTED] lower in 2015 compared to 2011 for the provision of retail LLs for the Broadband for schools programme.

Preliminary conclusion on Existing Competition in the MI WHQA Market

6.128 The analysis above is suggestive that there is existing competition within the MI WHQA Market. As evidence by the presence of independent networks, barriers to entry have, since the 2008 Decision, been overcome.

6.129 Furthermore, the low reliance on other SPs for the provision of retail LL services means that competition at the wholesale level is infrastructure based. Moreover, the widespread use of Enet's MANs, Eircom's network and P2P Radio links means that such infrastructure based competition is not confined to areas of high demand but relatively widespread throughout the State.

6.130 As such, it is ComReg's preliminary view that existing competition is suggestive that no SP has SMP in the MI WHQA Market.

Potential Competition in the in the MI WHQA Market

6.131 As noted in paragraph 6.121, potential competition is assessed having regard to factors such as control of infrastructure not easily duplicated, barriers to entry in the MI WHQA Market, as well as considering the overall strength of potential competitors.

6.132 Noting the presence of competitive constraints posed by existing competition, ComReg now assesses the likely effectiveness of any constraints likely to be posed by potential competition in the MI WHQA Market.

⁵⁰⁵ [REDACTED]

- 6.133 ComReg is of the preliminary view that barriers to entry have been overcome and that existing competition is infrastructure based, and that market shares indicate that the MI WHQA Market has a number of strong competitors operating within it.
- 6.134 Moreover, as ComReg must take a forward looking view of competition in this assessment, it considers that the prospects for competition in the MI WHQA Market appear, based on trends to date, to be favourable. ComReg notes that the roll-out of the SIRO network and the National Broadband Plan should, to the extent they can be utilised to provide MI WHQA LLs, further strengthen independent infrastructure based competition in the MI WHQA Market.

CBP Assessment in the MI WHQA Market

- 6.135 As noted in paragraph 6.22 strong buyers of MI WHQA products may also impact the competitive behaviour of SPs providing MI WHQA. In assessing CBP in the MI WHQA Market ComReg adopts the same approach set out with respect to the Low Bandwidth TI WHQA Market in paragraphs 6.69 to 6.94 above.
- 6.136 However, it should be noted from the outset that CBP is used to ascertain if strong buyers may provide a competitive constraint on an SP with a high market share. In such instances a market in which one supplier has a high share and barriers to entry are present may not lead to harmful outcomes for consumers if buyers have sufficient CBP. In general, purchasers in WHQA markets may have a degree of buyer power where they purchase large volumes and have a credible threat to switch supplier or to meet requirements through self-supply. In order for the threat to be effective, the volumes that are or can credibly be met from another source of supply need to have a material impact on the supplier's profitability.
- 6.137 In the case of MI WHQA, there is a low reliance on any other SP for supply, with the majority of retail MI LLs being supplied either on-net or purchased from a number of MI WHQA SPs. Furthermore, there are a number of possible suppliers of MI WHQA, such that the threat of switching supply is credible.

Size of the Buyer and its Relative Importance to the Seller

- 6.138 The strength of CBP can be influenced by the relative size of the buyer, with this being measured according to the buyer's share of relevant retail MI WHQA LLs purchased from the SP relative to total purchases of WHQA LLs from the same SP. The degree to which high shares of WHQA purchases are concentrated amongst one or more buyers could also be relevant.
- 6.139 However, based on the information supplied in response to the SIRs and the Qualitative Questionnaire ComReg is not aware of any retail MI LL SP having a high reliance on a particular MI WHQA provider.

Credible Alternative Sources of Supply

6.140 As set out in paragraphs 6.110 to 6.121 above, ComReg is of the view that there are a number of SPs competing across the majority of geographic areas, either through wired or wireless MI WHQA. This suggests that in many cases credible alternative sources of supply exist and would, likely impose a degree of competitive constraint in the MI WHQA Market.

Preliminary Conclusion on CBP Assessment in MI WHQA Market

6.141 Having regard to the analysis in paragraphs 6.135 to 6.140 above, ComReg's preliminary view is that there are sufficient credible alternative sources of supply that no SP is in a position to exercise SMP.

Overall Preliminary Conclusions on Competition within the MI WHQA Market

6.142 In paragraphs 6.110 to 6.141 above ComReg has assessed, existing competition, potential competition and CBP. Having regard to this analysis it is ComReg's overall preliminary view that the evidence is suggestive of no SP being likely to have SMP in the MI WHQA Market.

6.143 This is due, amongst other things, to market shares being well distributed across a number of SPs with no SP having a high and growing market share, the evidence of multiple SPs competing (and likely to continue to compete) on the basis of independent infrastructure and that barriers to entry appear to have been overcome.

<p>Question 4: Do you agree with ComReg's competition and SMP assessments in the Relevant WHQA Markets? Please explain the reasons for your answer, clearly indicating the relevant paragraph numbers to which your comments refer, along with all relevant factual evidence supporting your views.</p>
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7. Competition Problems in the Low Bandwidth TI WHQA Market and Impacts on Competition and Consumers

Overview

- 7.1 In this Section ComReg now seeks to identify those competition problems which, absent regulation⁵⁰⁶, could potentially arise in the Low Bandwidth ('LB') TI WHQA Market and, having done so, ComReg proceeds in Section 8 to consider the imposition of appropriate remedies to address the identified competition problems.
- 7.2 In Section 6, ComReg set out its preliminary view that, in accordance with Regulation 27(4) of the Framework Regulations, this market is not effectively competitive and proposed that Eircom be designated as having SMP in this market, thereby meaning that it has the ability to act independently of its competitors, customers and consumers.
- 7.3 In accordance with Regulation 27(4) of the Framework Regulations, where an undertaking is designated as having a position of SMP in a relevant market, ComReg is required to impose on that undertaking each of the obligations (or remedies) set out in Regulations 9 to 13 of the Access Regulations, as ComReg deems appropriate.
- 7.4 As noted in the European Commission's Explanatory Note to the 2014 Recommendation, the underlying purpose of the *ex-ante* regulatory framework is to deal with predictable competition problems that have their origin in structural factors in the industry. For example, the finding of an absence of effective competition in the LB TI WHQA Market indicates the potential for competition problems to arise within them over the review period in question, thereby justifying the imposition of *ex-ante* regulation.
- 7.5 It is ComReg's view that the underlying ability and incentives for Eircom to potentially engage in anti-competitive behaviour absent regulation is due to the lack of effective competition in the LB TI WHQA Market, coupled with Eircom's position as a vertically integrated supplier competing with its wholesale customers in downstream markets.

⁵⁰⁶ WHQA products have to date been provided by Eircom pursuant to regulatory obligations imposed on it under the 2008 Decision (and subsequent decisions). The assessment carried out in this Section of the Consultation is carried out in the context of what competition problems would be likely assuming that such SMP obligations were not in place.

- 7.6 ComReg would note that it is neither necessary to catalogue examples of actual abuse nor to provide exhaustive examples of potential abuse. Rather, the purpose of *ex-ante* regulation is to prevent the possibility of abuse of dominance given that Eircom has been identified on a preliminary basis as having SMP in the LB TI WHQA Market.

Types of Competition Problems

- 7.7 In determining what form of *ex-ante* regulatory remedies are justified in the low bandwidth TI WHQA Market, ComReg has carried out an assessment of potential competition problems that are likely to arise, assuming regulation is absent and taking account of the structure and characteristics of the LB TI WHQA Market.
- 7.8 In the absence of regulation in the LB TI WHQA Market, ComReg considers that Eircom would have the ability and incentive to influence competition through effects on prices, innovation, output and the variety or quality of goods and services provided. In general, there are a number of competition problems that may arise when an SMP operator seeks to:
- Exploit customers or consumers by virtue of its SMP position;
 - Leverage its market power into adjacent vertically or horizontally related markets with a view to foreclosing or excluding competitors in downstream and/or upstream markets; and
 - Exclude or delay investment and market entry in the low bandwidth TI WHQA Market (and ultimately downstream markets).
- 7.9 In considering the above competition problems that could arise⁵⁰⁷, ComReg has also been guided by experience in the market. Although it is not necessary *per se* to demonstrate actual abuse, examples of competition problems which have previously arisen even in the presence of existing regulation, can help ground the analysis in actual experience.

Exploitative Practices

- 7.10 Economic theory suggests that where a firm holds market power it is in a position to increase prices above competitive levels and/or reduce output below competitive levels, thereby earning higher than normal profits. These higher profits effectively create a wealth transfer from the consumer to the firm with market power. It is ComReg's preliminary view that Eircom is the undertaking with SMP in the LB WHQA Market and, given its presence in a number of adjacent markets, Eircom would have the ability and incentive to engage in exploitative practices. Such exploitative practices could include excessive pricing, inefficiency or inertia to the ultimate detriment of end-users. These potential concerns are considered below.

⁵⁰⁷ Such issues are also considered in Section 8 in the context of appropriate remedies (regulatory obligations) to address completion problems.

Excessive pricing

- 7.11 According to EU competition case law, excessive pricing refers to a situation where the prices charged by a dominant undertaking are not closely related to the value to the consumer and/or the cost of producing or providing the relevant service.⁵⁰⁸ Concerns about excessive pricing arise where, absent regulation, price levels are likely to be persistently high with no effective pressure (e.g. from new entry or innovation) to bring them down to competitive levels over the period of the review.
- 7.12 Eircom's presence in the LB TI WHQA Market is characterised by a high market share (as set out in Section 6, at the end of 2015 Eircom's market share was 80%), an absence of existing effective competition, high and non-transitory barriers to entry associated with control over infrastructure not easily replicated, limited scope for potential competition and insufficient CBP. Thus, there is insufficient pressure to constrain Eircom from behaving, to an appreciable extent, independent of its customers, competitors or consumers. There is also insufficient pressure to prevent Eircom from engaging in excessive pricing behaviour in the LB WHQA Market⁵⁰⁹. Hence, ComReg considers that Eircom is likely to have incentives to exploit its WHQA customers in this manner as it competes with these SPs in downstream retail and/or wholesale markets.
- 7.13 For example, by raising the price of LB TI WHQA inputs above the competitive level, this would raise input costs for those SPs that purchase Eircom's LB TI WHQA products/services (assuming Eircom would provide them with such inputs absent regulation) in order to offer services in the downstream retail and/or wholesale markets. Given that such inflated wholesale prices may be passed on by SPs to their retail and/or wholesale customers via higher prices, it could lead to reduced revenues for these SPs and possibly their exit from the downstream retail and/or wholesale markets. This way, Eircom's excessive pricing of LB TI WHQA inputs could lead to the exclusion of competitors who purchase these inputs from the downstream retail and/or wholesale markets, and ultimately hinder effective competition in these markets.
- 7.14 Excessive prices can pose a deterrent to entry and also distort investment incentives as the higher charges raise costs of production for the operators that purchase from Eircom and constrain their ability and incentive to invest in additional infrastructure. However, this may be less of a concern in a market where LL products are largely based on legacy technologies and, as noted in Section 6, new entry to the LB TIWHQA Market is unlikely.

⁵⁰⁸ Case C 27/76 United Brands v. Commission, [1978] ECR 207, [1978] 1 CMLR 429, paragraph 250. In United Brands the Court of Justice of the European Union held that: "...charging a price which is excessive because it has no reasonable relation to the economic value of the product supplied would be... an abuse".

⁵⁰⁹ As noted in paragraph 1.24, eircom's wholesale prices in the WHQA Market are currently regulated under the 2012 Price Control Obligation Decision.

- 7.15 To address the potential for excessive pricing in the LB TI WHQA Market, ComReg considers that *ex-ante* regulation is required. Competition law applied on an *ex-post* basis is often unsuitable in preventing excessive pricing, and this is evidenced by the scarcity of successful *ex-post* excessive pricing cases within EU jurisprudence. An *ex-post* approach to excessive pricing in markets such as the LB TI WHQA Market which is characterised by a lack of effective competition and high and non-transitory entry barriers, is not likely to offer adequate protection for consumers or promote effective competition. This is because addressing the issue of excessive pricing through competition law approaches (if it is proven to the required competition law standard) would likely occur substantially after the occurrence of the competition problem itself, thereby contributing to significant uncertainty amongst downstream market participants in the interim and undermining the development of effective competition to the detriment of consumers.
- 7.16 As noted in the analysis in Section 6, Eircom's LB TI WHQA products are currently regulated via various price control obligations⁵¹⁰. Absent such regulation, ComReg considers that prices for such products would not be reduced to a competitive level. Given the ability and incentives for Eircom, as the SMP undertaking, to engage in excessive/exploitative pricing, transparency, price control and related cost accounting obligations are therefore considered justified by ComReg to ensure that prices are set at levels that are reflective of the underlying efficient cost of providing these products and that such charges are applied in a non-discriminatory fashion to other Access Seekers and between Access Seekers and Eircom to itself.

Leveraging

- 7.17 Where a vertically integrated undertaking has SMP in one market that has close links with other adjacent markets either at a similar (e.g. horizontal) or different (e.g. vertical) level in the production or distribution chain, the SMP undertaking may attempt to transfer (leverage) its market power to such vertically and/or horizontally related markets. This could enable the SMP undertaking to strengthen its position in those related markets and/or potentially reinforce its existing market power in the SMP market in question.

⁵¹⁰ See discussion on exiting price control obligations in paragraphs 8.22 to 8.25 below.

- 7.18 Given the close relationship between the LB TI WHQA Market and other horizontally related markets (e.g. MI WHQA⁵¹¹) and vertically related markets (e.g. WPNIA and retail LL market(s)), there is potential for leveraging to occur, absent regulation. Leveraging may raise rivals' costs, introduce barriers to effective access to LB TI WHQA products, services and facilities in a timely manner, reduce competitive pressures on related wholesale/retail services and enable the SMP undertaking to extract additional revenues from its competitors, customers and ultimately consumers.

Vertical Leveraging

- 7.19 Vertical leveraging arises where a vertically integrated undertaking is able to leverage its SMP position at one level in the production or distribution chain into downstream markets in which it is also active.
- 7.20 In the context of the LB TI WHQA Market, vertical leveraging may occur given that Eircom, as the proposed SMP undertaking, has the incentive to use its market power in this market to affect the competitive conditions in downstream retail markets, in particular, through its ability to control the key network inputs used by Access Seekers - which compete against Eircom in the downstream markets. This could result in a distortion of or reduction in competition in these downstream markets, potentially resulting in harm to consumers in the form of higher prices, lower output/sales, reduced quality or consumer choice.
- 7.21 ComReg considers that, absent regulation, vertical leveraging could arise in the LB TI WHQA Market because Eircom is a vertically-integrated undertaking, has SMP in this market, and has the ability and incentive to leverage that market power into downstream markets, including (but not limited to) the provision of retail LL services. This would serve to enhance its market power in these downstream markets.

Non-Price Based Vertical Leveraging Behaviour

- 7.22 Vertical leveraging could be undertaken by Eircom in a number of ways, absent regulation in the low bandwidth TI WHQA Market. For example, vertical leveraging can manifest as an outright refusal to supply or a constructive refusal to supply. Refusal to supply is particularly relevant when the SMP operator is vertically integrated which facilitates the SMP operator to gain strategic advantage over rivals in the downstream markets.
- 7.23 Other examples of non-price vertical leveraging, which can be closely related to each other, can amount to constructive rather than outright denial of access, including:

⁵¹¹ For example, an Access Seekers may purchase both TI and MI WHQA services from the same supplier. Absent a wholesale supplier having the ability to serve these needs, its position in the TI WHQA Market may be undermined.

- (a) **Delaying tactics:** this relates to issues such as protracted negotiations in respect of the supply of existing or new LB TI WHQA products, services or associated facilities to downstream competitors. Another example would be the use of retail contract terms to effectively dissuade a customer from moving to a competing SP in a timely manner, thereby undermining the effectiveness of access to LB TI WHQA products, services and facilities. An SMP operator has the ability and incentive to engage in a 'first mover advantage' by offering a retail offering before an equivalent wholesale product is made available to potential Access Seekers. This first mover advantage has the potential to raise the Access Seekers' costs relative to the SMP operator and restrict the Access Seekers potential future retail sales.
- (b) **Quality discrimination:** providing competitors with LB TI WHQA at a lower quality of service (or inferior information) to that which Eircom provides to its own downstream arm (or to certain other competitors). For example, the SMP operator could give priority to its own customers when repairing faults or upgrading network assets.
- (c) **Creating or exploiting information asymmetries and the withholding of relevant information:** where competitors are dependent on Eircom to provide LB TI WHQA and need certain (quality or technical) information in order to effectively compete in the downstream retail and/or wholesale market, a lack of transparency or asymmetry in the provision of relevant information can impede competition. For example, a lack of transparency in the terms and conditions of supply for LB TI WHQA products that are self-supplied by the SMP provider could make it difficult for Access Seekers to make effective commercial or operational decisions that involve the use of LB TI WHQA inputs in the provision of their own downstream services. Such a lack of transparency could also fail to assure Access Seekers that low bandwidth TI WHQA products are provided on a non-discriminatory basis (including whether Eircom is in a position to demonstrate that there is equivalence of access).
- (d) **Disproportionate entry criteria:** This may, for example, include Eircom setting unreasonable terms and conditions for supply/use of access to LB TI WHQA products (including associated facilities). An example of this behaviour would include an undue requirement to use a particular (more expensive) technology beyond the extent which might be economically or technically justified.
- (e) **Unwarranted withdrawal of access already granted:** Eircom could seek to unreasonably withdraw access to facilities already granted.
- (f) **Unreasonable product bundling/tying:** this could include the bundling/tying of LB TI WHQA products in such a way that it damages the ability of Access Seekers to compete downstream. For example, if Eircom required Access Seekers using LB TI WHQA services to also purchase additional and unnecessary services that raises Access Seekers' costs of providing downstream retail services, this could damage their ability to compete effectively.

7.24 Further examples of the above non-price leveraging behaviours arise where a vertically-integrated SMP undertaking may create or exploit information asymmetries to the detriment of downstream competition. This could include for example any differences in interface between the SMP undertaking's internal access to IT systems, and wholesale customers' access. The infrastructure associated with Operational Support Systems ('OSS') and Business Support Systems ('BSS') is supported by IT systems, which evolve over time. Where, for example, Access Seekers do not have visibility or input into relevant Eircom's IT system changes and are not aware of the IT development process and its timetable, they will be unable to contribute or to make a request for service at the appropriate point. Moreover, it may be the case that operational changes of this kind are not implemented simultaneously or to the same standard for external and internal access.

Information Asymmetries

7.25 Given that Eircom is vertically integrated, it may also be difficult to compare the LB TI WHQA products (and associated facilities) its uses internally with those offered to Access Seekers, as well as to compare how LB TI WHQA products are developed and implemented. A lack of transparency in how products are both developed and implemented internally could also make it difficult to demonstrate equivalence and could provide an incentive for non-price means of leveraging market power. For example, in terms of product offerings, absent regulation, Eircom, as the undertaking proposed to be designated with SMP in the LB TI WHQA Market, could make downstream retail products using LB TI WHQA inputs which Access Seekers could not match, because no wholesale equivalent has been made available. In terms of product implementation, if Access Seekers are not aware of all the features of the wholesale products which are available to Eircom internally, they will not know that they can request these features themselves, and ultimately may find themselves offering an inferior product at the retail level. Furthermore, where certain LB TI WHQA services/information necessary for preparing a bid/tender proposal for a customer contract are not made available to competitors in sufficient time, this could also impede their ability to compete with the SMP operator for important downstream customers.

7.26 Another example of information asymmetries could include situations where Access Seekers require metrics on order processing, service delivery and fault repair to view the overall performance of Eircom's LB TI WHQA products from a provisioning and service assurance perspective. Failure by Eircom to provide such data to its wholesale customers would likely impair their ability to compare the performance of Eircom's supply of wholesale products. Uncertainty for Access Seekers (and their retail and/or wholesale customers) as to the performance and quality of their purchased LB TI WHQA inputs relative to the services and information made available internally to Eircom's retail arm could potentially discourage participation in markets dependent upon Eircom's wholesale products (for example, through a lack of visibility of average line-fault repair time between Eircom retail and wholesale customer faults).

- 7.27 Information asymmetries may also apply to future planning by the SMP undertaking. For example, changes by Eircom to its network topography such as its location of points of interconnect may have significant implications for Access Seekers using LB TI WHQA products. Insufficient notice of network and process changes relevant to the delivery of services in the retail market could significantly impede the ability of LB TI WHQA Access Seekers to launch corresponding retail products and to compete with Eircom on an equivalent basis in downstream markets. A lack of information and the associated uncertainty may discourage Access Seekers from investing in or expanding their network footprint (to avail of WHQA products)⁵¹² or downstream footprint (since there may be a perceived risk of stranded assets). However, as noted in Section 6, given that Analogue and TDM LLs are based on a legacy technology, ComReg considers it unlikely that existing Access Seekers would expand the network footprints given the risk of non-recovery of investments in a declining market. Furthermore, such information asymmetries may lead to a delayed consideration of Access Seekers' wholesale requirements as part of such network developments, also delaying/impeding their ability to respond to any new downstream offerings by the SMP undertaking.
- 7.28 A vertically-integrated SMP undertaking could also have an incentive to frustrate the retail/wholesale switching process through which retail customers can switch to an alternative product or an alternative SP. Access seekers may wish to migrate their downstream customers between wholesale products (or from wholesale products onto products offered on their own network), and may wish to carry out single or bulk migration of their customer base (for example, migrations from TI WHQA products to MI WHQA products). This should involve minimal disruption or delay from the downstream customer's perspective. Examples of actions which could disrupt the migration process could include rejecting migration orders on the basis of technicalities which were not made known to the requesting Access Seekers, requesting additional customer authorisation agreements, or preventing the shift of a large number of retail customers to alternative service provision. This type of action would impose an additional and unnecessary switching cost on Access Seekers and ultimately retail customers.
- 7.29 Further examples of potential leveraging behaviour related to the above could include possible disruption of customer migration processes such as failing to switch bundles of services in a seamless and co-ordinated manner (such that any service loss by the switching retail customer is minimised, if not entirely eliminated) and practices aimed generally at raising rivals' costs.⁵¹³

⁵¹² Access Seekers' use of LB TI WHQA products depends on the extent of their backhaul network. Investing in backhaul depends on the location of Eircom's Points of Interconnection.

⁵¹³ Unlike predatory pricing, certain practices can be employed which unfairly raise rival's costs and reduce competition but which do not necessarily require the SMP undertaking to incur short run losses. For example, an integrated firm with market power in an upstream market may have incentives to raise the price of the inputs it sells to its downstream rivals, thereby potentially raising their costs and reducing demand for their products. Furthermore, the integrated operator could potentially give priority to its own traffic at network bottlenecks or apply standards that are easier for its own retail affiliate to meet than for its downstream

7.30 ComReg considers that, absent regulation, these types of issues could arise in the low bandwidth TI WHQA Market given that Eircom is competing in downstream markets within which Access Seekers also compete or may seek to compete.

Price Based Vertical Leveraging Behaviour

7.31 Vertical leveraging may also be evident in pricing behaviour and, absent regulation, Eircom could attempt to foreclose competition in a downstream market by offering LB TI WHQA products at a price that would not allow an efficient Access Seeker to earn a sufficient margin and recover their efficiently-incurred costs. This could result in the foreclosure of competition from an Access Seeker through margin squeeze.

7.32 A margin squeeze could distort competition and have an adverse effect on consumers in a number of ways:

- Foreclosure of competitors, leading to higher prices;
- Setting higher prices for LB TI WHQA products to negate rivals' competitive advantages;
- Raising rivals' uncertainty, through the threat of a margin squeeze to deter competition.

7.33 ComReg considers that, absent regulation, vertical leveraging could arise in the LB TI WHQA Market because Eircom is a vertically-integrated undertaking, has SMP in this market, and has the ability and incentive to raise prices for LB TI WHQA products to foreclose competitors. If a vertically integrated SMP operator were to increase the price of LB TI WHQA products, without a corresponding retail price increase, its retail competitors might respond by raising their retail prices (as a result of higher wholesale prices), thereby lowering their margins or volume of orders for LB TI WHQA products (as a result of switching to the now-relatively cheaper SMP operator). Regardless of the response of retail competitors, it leads to a lower profits, thereby reducing their ability to exploit the economies of scale and lowering the available capital to invest further in the LB TI WHQA Market. However, ComReg notes that Eircom is not a vertically-integrated undertaking and given this and, the presence of an effective cost orientation obligation, the risks of margin squeeze may be negated.

competitors. (See Krattenmaker, T.G. and S.C. Salop (1986) "Anticompetitive Exclusion: Raising Rival's Costs To Achieve Power over Price", Yale Law Journal, 96:209-93; Salop, S.C. and D.T. Scheffman (1987), "Cost-Raising Strategies", Journal of Industrial Economics, 36:19-34).

- 7.34 Price Discrimination could be used by a vertically integrated operator with SMP in the LB TI WHQA Market to raise an Access Seekers' costs downstream and induce a margin squeeze. This is achieved by charging a higher price (above cost) to downstream competitors than implicitly charged to its own retail arm. Such a margin squeeze between LB TI WHQA price and downstream LL prices could undermine the effectiveness of a low bandwidth TI WHQA product offering and, in doing so, could harm competition in downstream retail markets by eliminating competing SPs, distorting competition or discouraging the entry of new SPs. However, ComReg notes that Eircom <[REDACTED] and given this and, the presence of an effective cost orientation obligation, the risks of margin squeeze may be negated.
- 7.35 Another example of pricing behaviour is predatory pricing. This could occur where a vertically integrated operator with SMP seeks to sell a LB TI WHQA product below the costs of production for a sustained period of time, with the intention of deterring market entry or putting a rival operator out of business, enabling the SMP operator to further increase its market power and later to raise prices. While consumers may benefit in the short run from low prices, consumer welfare is reduced in the long run due to the elimination of competition and consumer choice in the market. A vertically integrated operator with SMP upstream supplying an input to retail competitors might engage in predatory pricing at the retail level to expose retail competitors to a margin squeeze. However, ComReg notes that Eircom <[REDACTED] and given this and, the presence of an effective cost orientation obligation, the risks of margin squeeze may be negated.

Horizontal Leveraging

- 7.36 Horizontal leveraging arises where an undertaking with market power in one market is able to use it to exert undue influence into other markets that are at a similar level in the production or distribution chain. Examples of horizontal leveraging can include certain tying/bundling practices, cross subsidisation/predatory-type behaviour and/or where the SMP undertaking may seek to foreclose infrastructure-based competitors by way of an insufficient economic space⁵¹⁴ between the relative pricing of different upstream/intermediate inputs.
- 7.37 In the context of this market review, horizontal leveraging may occur where Eircom, which is likely to have SMP in the LB TI WHQA market, is competing in adjacent wholesale markets and has the ability and incentive to negatively impact the position of its competitors in these markets. Horizontal leveraging in this case could involve:
- Tying LB TI WHQA and other WHQA services, so an Access Seeker, in purchasing LB TI WHQA from Eircom, must also purchase MI WHQA or other

⁵¹⁴ "Economic space" refers to an appropriate space between the pricing of related wholesale or intermediate products/services sufficient to promote sustainable infrastructure competition to the benefit of end-users.

facilities from Eircom, thereby impacting the ability of other MI WHQA providers to compete effectively.

- 7.38 ComReg considers that some of these concerns exist given that Eircom could have the ability and incentive to price its wholesale inputs in a way that increases uncertainty.

Exclusionary practices

- 7.39 The SMP WHQA provider may also have the ability and incentive to behave in such a way that delays/deters network investment and entry into the downstream retail and/or wholesale markets. The LB TI WHQA provider may attempt to defend its existing SMP position in the LB TI WHQA Market by engaging in conduct aimed at foreclosing the market.
- 7.40 ComReg's preliminary view is that exclusionary behaviour that is likely to take place in the low bandwidth TI WHQA Market is behaviour closely associated with the ability and incentives of a vertically-integrated SMP undertaking, as discussed in paragraphs 7.17 to 7.38 above, in the context of leveraging and the exclusionary impacts in horizontally or vertically related markets. These include (but are not limited to) foreclosing competition by:
- (a) Refusing to supply access, applying unreasonable or discriminatory terms and conditions of access, and/or creating or exploiting information asymmetries;
 - (b) Engaging in exclusive contracts with downstream customers and exclusionary actions aimed generally at raising customer or consumer switching costs thereby impacting on potential competition;
 - (c) Raising costs of those competitors that rely on Eircom's Low Bandwidth TI WHQA inputs in providing downstream retail and/or wholesale services;
- 7.41 ComReg is of the preliminary view that, as the vertically integrated undertaking with SMP in the LB TI WHQA Market, Eircom has both the ability and incentives to restrict or distort the development of competition in the LB TI WHQA Market.

Overall Preliminary conclusions on competition problems

- 7.42 Having regard to the analysis set out in paragraphs 7.7 to 7.41, ComReg set out its preliminary view that, absent regulation, Eircom, as the SMP undertaking in the LB TI WHQA Market has the ability and incentive to engage in actions which could negatively impact on competition and customers in related retail and/or wholesale markets, as well as having the potential to reinforce its market power in the LB TI WHQA Market over time.

- 7.43 ComReg has presented examples of such behaviour and therefore considers that it is justified and proportionate to impose robust obligations on Eircom in the LB TI WHQA Market relating to access, transparency, non-discrimination, price control and cost accounting and accounting separation. The detail of these obligations is discussed in Section 8 below.

Question 5: Do you agree that the competition problems and the associated impacts on competition consumers identified are those which could potentially arise in the LB TI WHQA Market? Please explain the reasons for your answer, clearly indicating the relevant paragraph numbers to which your comments refer, along with all relevant factual evidence supporting your views.

8. Remedies in the Low Bandwidth TI WHQA Market

Introduction

- 8.1 In this Section ComReg sets out its preliminary views in relation to the imposition of remedies to address the competition problems in the LB TI WHQA Market and related markets identified in Section 7.
- 8.2 As noted in Section 5, the Low Bandwidth TI WHQA Market refers to the wholesale market for TI LLs with speeds up to and including 2Mb/s. In Section 6 ComReg set out its preliminary view that Eircom should be designated with SMP in this market.
- 8.3 ComReg's preliminary view is that imposition of a full suite of access obligations including access, non-discrimination, transparency, price control and accounting separation is warranted to address the competition concerns identified in the Section 7 above.
- 8.4 Furthermore, ComReg is of the preliminary view that due to the trivial number of Analogue Wholesale TI LLs currently in place (4 in total) and the fact that there has been no new orders for such products since 2002, it is proportionate to forbear on the imposition of access and/or any other remedies for this product.⁵¹⁵
- 8.5 This Section is set out as follows;
 - (a) ComReg's approach to specifying remedies, including the legal framework for their imposition (discussed in paragraphs 8.6 to 8.12);
 - (b) remedies that are currently in place under the 2008 Decision (and subsequent decisions) (discussed in paragraphs 8.13 to 8.25);
 - (c) an assessment of the approaches available to impose remedies (discussed in paragraphs 8.26 to 8.34);
 - (d) proposed regulatory remedies in the Low Bandwidth TI WHQA Market relating to access, non-discrimination, transparency, price-control and cost accounting, and accounting separation, as well as the withdrawal of certain remedies (discussed in paragraphs 8.35 to 8.265); and
 - (e) ComReg's overall preliminary conclusions on the imposition of remedies in the Low Bandwidth TI WHQA Market, along with the relevant consultation questions on which respondents' feedback is sought (discussed in paragraphs 8.266 to 8.269).

⁵¹⁵ See paragraph 8.28 below.

Approach to Specifying and Implementing Remedies

- 8.6 In Sections 6 and 7, ComReg set out its preliminary view that Eircom has SMP in the Low Bandwidth TI WHQA Market and identified a range of competition problems and competition or consumer impacts that, in the absence of regulation, could arise in this and related markets. These competition problems related to, amongst other things, Eircom having the ability and the incentive to foreclose competition and/or exploit wholesale (and retail) customers, ultimately to the detriment of competition and consumers. In this Section ComReg considers the imposition of regulatory remedies (or obligations) to address these competition problems.
- 8.7 To this end ComReg sets out the legal framework for imposing remedies below.

Legal Framework for Imposing Remedies

- 8.8 In accordance with Regulation 8(1) of the Access Regulations⁵¹⁶, where an operator is designated as having SMP in a relevant market, ComReg is required⁵¹⁷ to impose on such an operator the obligations set out in Regulations 9 to 13 as ComReg considers appropriate. In this regard, the obligations that may be imposed by ComReg on SMP undertakings are those relating to:
- (a) Access;
 - (b) Transparency;
 - (c) Non-Discrimination;
 - (d) Price Control and Cost Accounting; and
 - (e) Accounting Separation.
- 8.9 In addition, Regulation 8(6) of the Access Regulations provides that any of the above obligations imposed must:
- (a) be based on the nature of the problem identified;
 - (b) be proportionate and justified in the light of the objectives laid down in Section 12 of the Communications Regulation Acts 2002 (as amended) and Regulation 16 of the Framework Regulations⁵¹⁸; and

⁵¹⁶ European Communities (Electronic Communications Networks and Services) (Access) Regulations 2011 (S.I. No. 334 of 2011) (the 'Access Regulations').

⁵¹⁷ The SMP Guidelines also state at paragraph 17 that "NRAs must impose at least one regulatory obligation on an undertaking that has been designated as having SMP".

⁵¹⁸ Pursuant to section 12 of the Communications Regulation Acts 2002 (as amended), ComReg's relevant objectives in relation to the provision of electronic communications networks and services are: (i) to promote competition, (ii) to contribute to the development of the internal market, and (iii) to promote the interests of

- (c) only be imposed following public consultation and notification of the draft measures to the European Commission, BEREC⁵¹⁹ and other NRAs in accordance with Regulation 12 of the Framework Regulations.
- 8.10 Regulations 12(1) and 12(4) of the Access Regulations also provide statutory criteria that ComReg must take into account before imposing access obligations on an SMP undertaking. These criteria include, inter alia, examining the technical and economic viability of using or installing competing facilities; the feasibility of providing access; the initial outlay of investment by the undertaking; and the need to safeguard competition in the long term.
- 8.11 Regulation 13(2) and Regulation 13(3) of the Access Regulations provide that ComReg is also required, when imposing price control obligations, to take into account:
- (a) the investment made by the SMP operator which ComReg considers relevant and allows such an operator a reasonable rate of return on capital employed, taking into account any risks involved specific to a particular new investment network project⁵²⁰; and
 - (b) ensure that any cost recovery mechanism or pricing methodology that ComReg imposes serves to promote efficiency and sustainable competition and maximise consumer benefits⁵²¹.
- 8.12 These considerations are taken into account throughout this Section, as appropriate, when assessing whether and what form of remedy to impose, and are also discussed in further detail in the context of the Regulatory Impact Assessment found in Section 9 of this Consultation. ComReg has also taken the following into account in considering the imposition of remedies on the SMP operator:

users within the Community. Regulation 16 of the Framework Regulations further specifies ComReg's obligations.

⁵¹⁹ Body of European Regulators for Electronic Communications.

⁵²⁰ Pursuant to Regulation 13(2) of the Access Regulations.

⁵²¹ Pursuant to Regulation 13(3) of the Access Regulations.

- (a) the European Regulators Group's ('**ERG**'⁵²²) common position on the approach to appropriate remedies in the electronic communications networks and services regulatory framework⁵²³ and its common position on the best practice in remedies for the wholesale leased lines markets⁵²⁴;
- (b) the comments letters issued by the European Commission pursuant to Articles 7 and 7a of the Framework Directive in its review of regulatory measures notified by Member States under the EU consultation mechanism for electronic communications service; and
- (c) the European Commission's 2005 Accounting Separation and Cost Accounting Recommendation⁵²⁵.

Existing Remedies

8.13 Before considering which remedies would best meet ComReg's statutory/regulatory objectives in the LB TI WHQA Market, it is worth highlighting the existing remedies that are in place with respect to Eircom's provision of LLs arising from the obligations imposed in the 2008 Decision and subsequently in other relevant decisions.

Existing Access Remedies

8.14 Eircom is currently subject to a range of access obligations having been designated with SMP in the wholesale terminating segment leased line market as described in section 8 of the 2008 Decision. These remedies were designed to address various competition problems that were identified at that time. The obligations imposed under the 2008 Decision require Eircom to, amongst other things, provide:

⁵²² Pursuant to [Regulation \(EC\) No 1211/2009 of the European Parliament and the Council of 25 November 2009 establishing the Body of European Regulators for Electronic Communications \(BEREC\) and the Office](#) ERG was replaced with the Body of European Regulators for Electronic Communications (BEREC) in 2010.

⁵²³ Revised ERG Common Position on the approach to Appropriate remedies in the ECNS regulatory framework, ERG (06)33, May 2006, available at:

http://www.erg.eu.int/doc/meeting/erg_06_33_remedies_common_position_june_06.pdf.

⁵²⁴ BEREC Common Position on best practice in remedies imposed as a consequence of a position of significant market power in the relevant markets for wholesale leased lines, Document BOR(12) 126 published 26 November 2012, available at:

http://berec.europa.eu/eng/document_register/subject_matter/berec/regulatory_best_practices/common_approaches_positions/1096-revised-berec-common-position-on-best-practices-in-remedies-as-a-consequence-of-a-smp-position-in-the-relevant-markets-for-wholesale-leased-lines.

⁵²⁵ European Commission Recommendation of 19 September 2005 on accounting separation and cost accounting systems under the regulatory framework for electronic communications (2005/698/EC) the '**2009 Termination Rates Recommendation**').

- (a) Wholesale Leased Lines ('WLLs')⁵²⁶;
- (b) Partial Private Circuits ('PPCs'),⁵²⁷ including handover; and
- (c) to meet all reasonable requests for access to network elements or associated facilities in the market.

8.15 The 2008 Decision and subsequent decisions also imposed obligations upon Eircom:

- (a) to give third parties access to products, services, network elements or facilities in the market including access to any additional wholesale inputs which are necessary for the provision of end to end LLs to end users;
- (b) to negotiate in good faith with undertakings requesting access;
- (c) not to withdraw access to facilities already granted without ComReg's prior approval;
- (d) to continue to make available the in-situ transfer of end-to-end LLs;
- (e) to grant open access to technical interfaces, protocols or other key technologies that are indispensable for the interoperability of services or virtual network services;
- (f) to provide access to Operational Support Systems ('OSS') and similar software systems necessary to ensure fair competition in the provision of services;
- (g) to interconnect with networks or network facilities;
- (h) to comply with a set of Key Performance Indicators ('KPIs') which were further refined in the 2011 KPI Decision⁵²⁸; and
- (i) to invoice other authorised operators on a monthly basis, one month in advance of provision of the service with the credit terms remaining at 30 days, as specified in the 2011 Access and Transparency Decision⁵²⁹.

⁵²⁶ A Wholesale Leased Line is a service provided by Eircom whereby Eircom supply the leased line from one end-user premises to another.

⁵²⁷ A Partial Private Circuit ('PPC') is a service whereby Eircom supply leased line connections to end-user premises and present these at a point of interconnection or handover to another SP. The operator may use its own network to deliver the "other end" of the leased line. PPCs (Partial Private Circuits) is a generic term used to describe a category of private circuits (leased lines) that terminate at a point of connection between two communications providers' networks. It is therefore the provision of transparent transmission capacity between a customer's premises and a point of connection between the two communications providers' networks. It may also be termed a part leased line.

⁵²⁸ See "Introduction of Key Performance Indicators for Regulated Markets", Response to Consultation and Decision, ComReg Document No 11/45, Decision D05/11, June 2011 (the '**2011 KPI Decision**').

⁵²⁹ ComReg Document 11/22, Decision D02/11, Amendments to the transparency obligation and the access obligation in the market for wholesale terminating segments of leased lines, ComReg document No.11/22 published 22 March 2011 ('**2011 Access and Transparency Decision**').

- 8.16 ComReg also imposed the following conditions with respect to the access obligations:
- (a) to conclude legally binding and fit for purpose Service Level Agreements ('**SLAs**'⁵³⁰) with Other Authorised Operators ('**OAOs**');
 - (b) to negotiate in good faith with OAOs in relation to the conclusion of legally binding SLAs;
 - (c) to ensure that SLAs include provisions for service credits⁵³¹ arising from a breach of the SLA;
 - (d) to update and publish the industry SLA as required; and
 - (e) to provide to ComReg and publish on a monthly basis, performance statistics as specified by ComReg.
- 8.17 The list of Urban Centres (originally 15 Urban Centres were listed in Annex A of the 2008 Decision) which related to defining the market for the trunk segment of wholesale LLs was amended and increased to 16 and later to 20 Urban Centres, under the 2010 Urban Centres Decision⁵³² and the 2013 Urban Centres Decision⁵³³.

Existing Non-Discrimination Remedies

- 8.18 Eircom is also subject to non-discrimination obligations under the 2008 Decision. These include requirements on Eircom to:
- (a) apply equivalent conditions in equivalent circumstances to other undertakings providing equivalent services;
 - (b) provide services and information to OAOs under the same conditions, according to the same timescales, on the same basis and quality, as Eircom provides for its own services or those of its subsidiaries or partners; and
 - (c) provide to OAOs information which is required to support existing and future products, services and associated facilities in an accurate and timely manner.

⁵³⁰ An SLA is essentially a legally binding contract in relation to the service levels that Eircom would commit to when supplying Wholesale TI LLs to Access Seekers, as more particularly set out in Eircom's LLRO, as may be amended from time to time.

⁵³¹ A service credit is a financial credit which is provided by Eircom to an Access Seeker where Eircom has failed to meet the service levels which Eircom commits to from time to time in its SLA.

⁵³² ComReg Document 10/12, Decision D02/10, Leased Line Markets: Review of Urban Centres Response to Consultation 09/86 and Final Decision, published 15 February 2010 ('**2010 Urban Centres Decision**').

⁵³³ ComReg Document No. 13/27, Decision D12/13, Leased Line Markets: Further review of Urban Centres, published 29 July 2013 ('**2013 Urban Centres Decision**').

Existing Transparency Remedies

- 8.19 The 2008 Decision also subjected Eircom to a range of transparency obligations whereby it is required to make certain information available in relation to interconnection and access. These include specific obligations on Eircom to:
- (a) publish on its wholesale website, and keep updated, a Reference Offer ('**RO**'), which shall include a description of the relevant offerings broken down into component parts and a description of the associated terms and conditions, including prices;
 - (b) ensure that its RO is sufficiently unbundled so that undertakings are not required to pay for facilities which are not necessary for the service requested;
 - (c) publish at least three months in advance any proposed changes to the RO and any proposed changes to wholesale prices and the application of such prices. Furthermore, Eircom is required to notify ComReg five days in advance of any such publication as the prior approval of ComReg is necessary before the implementation of any such changes.
 - (d) publish information, such as accounting information, technical specifications, network characteristics, terms and conditions for supply and use, and prices;
 - (e) publish all SLAs concluded and/or amended and publish a standard industry SLA on its wholesale website;
 - (f) publish KPIs to demonstrate that a product is continually fit for purpose; and
 - (g) provide information which is required to support existing and future products in an accurate and timely manner to OAOs.
- 8.20 The 2011 KPI Decision required Eircom to publish on a publicly available website a set of KPIs across a range of products including the terminating segments of the Wholesale Leased Line Market.
- 8.21 The 2011 Access and Transparency Decision, further amended the transparency obligations that existed under the 2008 Decision, removing the obligation to publish pricing information for WLLs (Eircom Wholesale Leased Line product) of bandwidths greater than 10Mb/s.

Existing Price Control and Cost Accounting Remedies

- 8.22 In the 2008 Decision, all existing cost accounting obligations in place prior to the effective date of that decision were maintained pending the completion of a further consultation on accounting separation and cost accounting obligations. The 2008 Decision specified that the prices charged for WLLs up to and including bandwidths of 2Mb/s were to be no more than the prices in place at the effective date pending a further consultation. WLLs with bandwidths above 2Mb/s, were to be offered to OAOs on the same terms and conditions equivalent to those offered to Eircom's retail arm.

- 8.23 PPC pricing was specified to be cost oriented based on costs calculated on a forward looking long run incremental costs ('FL-LRIC') or an alternate model, pending a future consultation. An obligation not to cause a margin squeeze was also imposed.
- 8.24 This further pricing and cost control consultations mentioned above were completed and the resultant decision was published in the 2012 Pricing Decision⁵³⁴. This directed Eircom to charge no more than the existing prices for WLL services as published in Appendix A of the 2012 Pricing Decision. Eircom was also directed to charge not less than the minimum price floors, as specified in a Similarly Efficient Operator ('SEO') test⁵³⁵, so as not to cause a margin squeeze between related WLL services, including (but not limited to) PPCs and NGN Ethernet. Eircom was further directed to base charges for PPCs and NGN Ethernet on the basis of a Bottom Up Long Run Average Incremental Cost plus ('BU-LRAIC+') methodology.

Existing Accounting Separation Remedies

- 8.25 In the 2008 Decision ComReg specified that Eircom was subject to the then relevant accounting separation decisions which were existing at the time of publication. These decisions have been revised and updated in the 2010 Accounting Separation Decision⁵³⁶

Assessment of Regulatory Approaches to Imposing Remedies in the Low Bandwidth TI WHQA Market

- 8.26 In Section 6, ComReg has set out its preliminary view that Eircom has SMP in the LB TI WHQA Market. Furthermore, in Section 7, ComReg identified a range of potential competition problems that may arise in this market, absent regulation, arising from Eircom's ability and incentives as a vertically integrated SMP undertaking that competes with Access Seekers⁵³⁷ in both the retail and wholesale LL markets. In this Section, ComReg assesses the regulatory options for addressing the competition problems that have been identified, before then proposing specific regulatory obligations.

⁵³⁴ ComReg Document No. 12/03, Decision D02/12 Response to Consultation Document No. 10/70 and 11/32: A final decision further specifying the price control obligation in the market for wholesale terminating segments of leased lines, published 2 February 2012 ('**2012 Pricing Decision**')

⁵³⁵ A Similarly Efficient Operator ('SEO') test is a test which seeks to establish the costs than an efficient operator similar to the incumbent in terms of efficiency would incur in providing service/s.

⁵³⁶ ComReg Document 10/67, Decision D08/10, Accounting Separation and the Cost Accounting Review of Eircom Limited, August 2010 ('**2010 Accounting Separation Decision**').

⁵³⁷ The main SPs active in the Low Bandwidth TI WHQA market are BT, Eircom, Colt and enet.

Option of ‘No Regulation’ in the Low Bandwidth TI WHQA Market

- 8.27 ComReg has considered whether the option of de-regulation or regulatory forbearance is appropriate in the LB TI WHQA market.
- 8.28 ComReg is proposing to forbear from applying regulatory obligations with respect to wholesale Analogue LLs. ComReg notes that at the end of 2015 there were only four such wholesale Analogue LLs in-situ. The most recent delivery date for any of these lines was in 2002, i.e. it has been 14 years since any live wholesale Analogue LL was last provided. ComReg considers that this clearly demonstrates that Access Seekers do not use Analogue LLs and have been competing with Eircom without using this wholesale input. Given the low number of such Analogue LLs remaining, ComReg considers that it is no longer reasonable or proportionate to continue to impose any obligations on Eircom to supply any wholesale variant of this service. ComReg therefore proposes to withdraw all such related obligations.
- 8.29 Similarly, ComReg is proposing to forebear from imposing regulatory obligations on Eircom in respect to wholesale end-to-end digital leased lines (‘WLLs’) and wholesale Channelised E1 (2Mb/s) Access⁵³⁸ LL services. ComReg is of the preliminary view that given the extent of interconnects currently in place it is now possible for OAOs, in the presence of regulation of the LB TI WHQA Market, to compete in the provision of digital leased lines using PPC inputs. As discussed later, obligations with respect to the supply of PPCs are the access remedy which is to be applied to the LB TI WHQA Market and ComReg considers that this PPC wholesale input is sufficient to allow an Access Seeker to replicate Eircom’s retail TI LL services and thereby, compete at the retail level.
- 8.30 As noted in paragraph 8.8 above, Regulation 8(1) of the Access Regulations and Regulation 27(4) of the Framework Regulations require ComReg to impose at least some level of regulation on undertakings designated as having SMP. In Section 6, ComReg set out its view that LB TI WHQA Market is not effectively competitive (and is not likely to become effectively competitive within the timeframe covered by this review). In Section 7, ComReg identified a range of competition problems that could occur in the LB TI WHQA Market and related markets, absent regulation.

⁵³⁸ This is the wholesale product listed in Issue 1.0 of Eircom’s “Wholesale Leased Line Product Description” as currently published on its wholesale website as distinct to E1 Channelised Links required for the delivery of sub 2Mb/s PPC EULs

- 8.31 In view of this assessment, it is ComReg's preliminary view that LB TI WHQA Market (and downstream markets) would be unlikely to function effectively absent regulation. This would not be in the interest of promoting sustainable competition. ComReg has set out its preliminary view that Eircom has the ability and incentive to exclude or foreclose Access Seekers competing in the provision of wholesale and/or retail LB TI LLs by refusing to supply them with its LB TI WHQA products, services and facilities (including constructive refusal), or by setting prices at an excessive level.⁵³⁹
- 8.32 It is ComReg's preliminary view that the option of regulatory forbearance in the LB TI WHQA Market is not, therefore, appropriate or justified. The relevant issue to be considered, therefore, relates to what form of regulation is appropriate. In particular, which of the remedies identified in paragraph 8.8 above are appropriate having regard to the particular circumstances of the LB TI WHQA Market, the associated competition problems and taking account of the relevant statutory requirements to which ComReg must have regard to when imposing remedies. ComReg sets out its preliminary views on these issues below.

Option to impose remedies in the Low Bandwidth TI WHQA Market

- 8.33 As noted in paragraphs 8.14 to 8.25 Eircom has to date been subject to a range of SMP based regulatory obligations as imposed primarily in 2008 Decision and subsequent decisions. These obligations require Eircom to provide Access Seekers with wholesale access to TI LLs and to do so on non-discriminatory and transparent terms and conditions, including at regulated prices.
- 8.34 ComReg sets out below its preliminary views on the detail of the imposition of regulatory obligations on Eircom in the LB TI WHQA Market.

Proposed Remedies in the Low Bandwidth TI WHQA Market

- 8.35 In the paragraphs below ComReg sets out its preliminary views regarding the remedies that it proposes to impose upon Eircom in the LB TI WHQA Market. These include:
- (a) Access obligations (discussed in paragraphs 8.36 to 8.93);
 - (b) Non-discrimination obligations (discussed in paragraphs 8.94 to 8.111);
 - (c) Transparency obligations (discussed in paragraphs 8.112 to 8.149);
 - (d) Price control and cost accounting obligations (discussed in paragraphs 8.150 to 8.257); and

⁵³⁹ See Section 7 above.

- (e) Accounting separation obligations (discussed in paragraphs 8.258 to 8.263).

Access Remedies

Overview

- 8.36 As identified in Section 6, in providing retail and/or wholesale LB TI LLs, a number of service providers are largely dependent upon the use of Eircom's wholesale services due to its largely non-replicable ubiquitous copper network. ComReg has already set out its view that Eircom has the ability and incentive to refuse to supply wholesale LB TI LLs to Access Seekers, either actually or constructively, or to provide these services on discriminatory or unreasonable terms and conditions (including in relation to price) and that this would likely hinder competition in the market. This would ultimately be detrimental to the interests of end-users, and would be contrary to the objectives set out in Section 12 of the Communications Regulation Acts 2002 (as amended) and Regulation 16 of the Framework Regulations.
- 8.37 ComReg's preliminary view is that there are likely to continue to be differences in bargaining power⁵⁴⁰ between Eircom and Access Seekers, particularly given the absence of credible alternative sources of supply within the timeframe of this review period.
- 8.38 Absent the presence of effective access remedies, ComReg would be left to address any such refusal by Eircom to supply wholesale LB TI LLs either through its general dispute resolution or compliance functions, all of which would occur after the fact, take time⁵⁴¹ to resolve, be specific to the bilateral circumstances between the relevant parties and not, thereby contributing to regulatory certainty amongst market players. As a consequence, this could be damaging to downstream competition and ultimately consumers.
- 8.39 Such case-by-case interventions by ComReg would also be inefficient and ineffective in resolving the broader competition problem of denial/delayed access by an SMP operator. In this regard, it is worth noting that the European Commission has made several comments⁵⁴², under Article 7/7a of the Framework Directive, on the imposition by NRAs of SMP-type obligations pursuant to the exercise of dispute resolution functions. Such European Commission decisions clearly highlight the need for effective remedies to be imposed through a formal market analysis process. This includes the imposition of access (and other) obligations on any operators found to have SMP.

⁵⁴⁰ ComReg considered the impact of CBP in Section 6, and considered it to be ineffective.

⁵⁴¹ Including time for ComReg to consider the dispute, along with possible public consultation and notification to the European Commission.

⁵⁴² See European Commission serious doubts/comments and [BEREC Opinions](#) (where made) on Polish cases [PL/2010/1127](#), [PL/2011/1273](#), [PL/2011/1255-1258](#) and Latvian case [LV/2012/1296](#).

- 8.40 Additionally, ComReg could seek to use its *ex post* competition law powers. However, such powers could ultimately result in a finding by an Irish court that an undertaking has abused its dominant position, but not necessarily require access to be provided as an outcome to any such finding. Similar to the reasons above, a competition law approach would also take significant time to resolve, be specific to the relevant circumstances of the case and not contribute to regulatory certainty amongst market players.
- 8.41 Overall, therefore, ComReg considers that dispute resolution (which can be of relevance in resolving access and other issues in certain circumstances) and *ex post* competition law approaches would not be effective in resolving issues concerning denial of access in the LB T I LL Markets.
- 8.42 Regulation 12(1) of the Access Regulations provides that ComReg may, in accordance with Regulation 8 of the Access Regulations, impose on an operator obligations to meet reasonable requests for access to, and use of, specific network elements and associated facilities where ComReg considers that the denial of such access, or the imposition by operators of unreasonable terms and conditions having a similar effect, would:
- (a) hinder the emergence of a sustainable competitive retail market;
 - (b) not be in the interests of end-users; or
 - (c) otherwise hinder the objectives set out in Section 12 of the Communications Regulation Acts 2002 (as amended) and Regulation 16 of the Framework Regulations.
- 8.43 Obligations must also be proportionate and justified in the light of the objectives laid down in Section 12 of the Communication Regulation Act 2002 and Regulation 16 of the Framework Regulations.
- 8.44 Regulation 12(2)(a) to 12(2)(j) and Regulation 12(3) of the Access Regulations provide that ComReg can impose, where appropriate, additional access obligations and may attach conditions covering fairness, reasonableness and timeliness in relation to those access obligations.
- 8.45 As noted above, pursuant to Regulation 12(4) of the Access Regulations, when considering whether to impose obligations referred to in paragraphs (1) and (2) of Regulation 12 and, in particular, when assessing whether such obligations would be proportionate to the objectives set out in Section 12 of the Communications Regulation Acts 2002 (as amended), ComReg has to take the following factors into account:
- (a) the technical and economic viability of using or installing competing facilities, in light of the rate of market development, taking into account the nature and type of interconnection and access involved;
 - (b) the feasibility of providing the access proposed, in relation to the capacity available;
 - (c) the initial investment by the facility owner, bearing in mind the risks involved in making the investment;

- (d) the need to safeguard competition in the long-term;
- (e) where appropriate, any relevant intellectual property rights; and
- (f) the provision of pan-European services.

8.46 The relevant provisions are taken into account below in ComReg's consideration of the access remedies that ComReg proposes to impose upon Eircom in order to address the competition problems identified in Section 7. An overview of Eircom's existing access obligations has also been provided in paragraphs 8.13 to 8.25 above.

Consideration of statutory criteria on proposed access obligations

8.47 In paragraphs 8.10 and 8.45 above, ComReg set out a range of statutory criteria that ComReg must consider when imposing access obligations. These criteria are considered below having regard to the proposed access obligations set out in paragraphs

- (a) **Technical and economic viability of using or installing competing facilities:** In Sections 5 and 6, ComReg defined the LB TI WHQA Market and has set out its preliminary view that existing competition, potential competition and CBP are unlikely to result in effective competition within such a market. In light of this, using or installing competing facilities to provide LB TI WHQA products is not likely to be economically feasible within the period of this review. This is evidenced by the lack of meaningful independent entry into the LB TI WHQA Market since the 2008 Decision and Eircom's high and persistent market share. On a forward looking basis, ComReg does not consider that barriers to entry may sufficiently be eroded over time (given, for example, TDM is a legacy technology with demand for LLs declining, SPs are not likely to commit to investments given the risks they will be sunk and non-recoverable). However ComReg does not consider it likely that any market entry will materially alter the competitive position within the LB TI WHQA Market within the period of this review. Eircom has to date been providing LB TI WHQA products, services and facilities and it is, therefore, technically viable to do so for the period of the review.
- (b) **Feasibility of providing access in relation to capacity available:** Access to LB TI WHQA products, services and facilities are currently provided by Eircom, albeit on foot of existing regulatory obligations. On a forward-looking basis, ComReg is not aware that there would be any material capacity constraints that would give rise to Eircom facing difficulties in meeting the proposed access obligations. Indeed, as noted in Section 5, given the overall decline in LB TI LLs since the 2008 Decision, it is likely that spare capacity exists on Eircom's network, such that capacity constraints are not likely to unduly restrict Eircom's ability to meet the proposed access obligations.

- (c) ***The need to safeguard competition:*** In Section 7 and throughout this Section, ComReg has highlighted the impact on downstream competition and the impacts on end-users that could arise given Eircom's ability and incentives to potentially engage in exploitative or exclusionary behaviours in the LB TI WHQA Market and related markets (absent regulation). These include, *inter alia*, actual or constructive denial of access, excessive pricing and other behaviours which could damage the development of sustainable competition in the LB TI WHQA market. ComReg considers that imposing access (and other obligations) in the LB TI WHQA Market will ultimately promote competition in the retail LB TI WHQA market, to the benefit of consumers.
- (d) ***Intellectual property rights:*** ComReg's preliminary view is that intellectual property rights are not likely to be a significant concern in the context of the provision of access to LB TI WHQA products, services and facilities.
- (e) ***Pan European Services:*** ComReg's preliminary view is that its proposed approach should facilitate the provision of pan-European services since the proposed approach is consistent with the policies of the European Commission and other NRAs. Consistent regulation of TI LLs across the EU will help to support a seamless provision of pan-European services by allowing SPs in other Member States to provide electronic communications services in Ireland.

8.48 In view of the above, ComReg's preliminary view is that the proposed obligations requiring Eircom to provide access to LB TI WHQA products, services and associated facilities, are proportionate and justified.

8.49 ComReg has also considered whether access obligations would be sufficient in themselves to resolve the identified competition problems. For the reasons set out in the discussion of the other proposed remedies below, ComReg does not consider this to be the case. For example, the imposition of access obligations alone would not resolve issues such as excessive pricing or margin squeeze, discrimination on price or quality grounds, or ensure transparency of terms and conditions of access.

Reasonable Requests for Access to Wholesale Low Bandwidth TI LL Products, Services and Facilities

8.50 ComReg considers it necessary to impose a range of access obligations upon Eircom which are ultimately intended to facilitate sustainable competition in downstream markets.

8.51 An overview of existing access obligations is set out in paragraphs 8.14 to 8.17 above.

8.52 ComReg's preliminary view is that, pursuant to Regulation 12(1) of the Access regulations, Eircom should be required to meet all reasonable requests from undertakings for the provision of access to LB TI WHQA products, services and facilities.

8.53 As noted in Section 6, ComReg does not consider that existing or potential competition would effectively constrain Eircom's market power within the lifetime of this market review. In particular, ComReg has noted that competition has and, for the period of this review, is likely to continue to be heavily dependent on availability of wholesale access to LB TI products, services and facilities. In this respect, access to these elements is necessary to maintain competition and to minimise foreclosure concerns that could arise, absent such regulation.

Additional Proposed Access Remedies

8.54 In addition, apart from the general obligation above to meet reasonable requests for access to LB TI WHQA products, services and facilities, ComReg proposes to impose requirements upon Eircom to provide a range of specific products, services and facilities, as well as more general requirements governing this.

8.55 In this respect, ComReg proposes to impose the following specific obligations upon Eircom in order to address identified competition problems and ultimately to promote the development of competition to the benefit of end-users:

- (a) to provide access to Partial Private Circuits ('PPC')⁵⁴³ which consist of:
 - (i) End User Links ('EUL(s)')⁵⁴⁴ of bandwidths 64Kb/s up to and including 2Mb/s, (discussed in paragraphs 8.59 to 8.62 below);
 - (ii) Interconnection Services, in particular, Transport Links ('TL(s)')⁵⁴⁵ (including In-Span Handover ('ISH')⁵⁴⁶ and Customer Sited Handover ('CSH')⁵⁴⁷ variants) (discussed in paragraphs 8.63 to 8.68);
- (b) to negotiate in good faith with undertakings, requesting Access (discussed in paragraphs 8.69 to 8.72);
- (c) to negotiate in good faith with undertakings, requesting Access (discussed in paragraphs 8.69 to 8.72);

⁵⁴³ A PPC is an interconnection service providing dedicated capacity between an end-user premises to an Access Seeker's Point of Handover. It consists of 2 components, namely an End User Link and a Transport Link. It is described in Eircom's PPC Product Description currently published at http://www.openeir.ie/Products/Data/Partial_Private_Circuits/.

⁵⁴⁴ An EUL refers to the portion of a Partial Private Circuit which connects an end-user's premises to a Transport Link. It is described in Eircom's PPC Product Description currently published at http://www.openeir.ie/Products/Data/Partial_Private_Circuits/.

⁵⁴⁵ A TL (Transport Link) refers to the interconnection service which connects a SP's network to the Eircom network. It is a large bandwidth circuit used to present aggregate lower speed EULs to the SP. It is described in Eircom's PPC Product Description currently published at http://www.openeir.ie/Products/Data/Partial_Private_Circuits/.

⁵⁴⁶ In-Span Handover is where the SP and Eircom's fibre optic cables are interconnected in an underground chamber next to the Eircom serving exchange thereby connecting both operators respective exchange facilities.

⁵⁴⁷ Customer Sited Handover is where Eircom places termination equipment in the SP's premises and the point of interconnection is therefore located in the SP's premises.

- (d) not to withdraw Access to facilities already granted without the prior approval of ComReg (discussed in paragraphs 8.73 to 8.75);
 - (e) to grant open access to technical interfaces, protocols or other key technologies that are indispensable for the interoperability of products, services or facilities (discussed in paragraph 8.76); and
 - (f) to provide access to OSS or similar software systems necessary to ensure fair competition in the provision of services (discussed in paragraphs 8.77 to 8.79);
- 8.56 ComReg is also proposing to impose certain conditions on the access obligations dealing with fairness, reasonableness and timeliness (discussed in paragraphs 8.80 to 8.85 below), namely:-
- (a) to conclude legally binding SLAs in respect of the services and products offered, and to update and publish such SLAs, and to insure that all SLAs include the payment of service credits arising from a breach of the SLA; and
 - (b) to ensure that the SLAs include performance metrics, the latter being the measure of performance levels achieved by Eircom within a specified period, as calculated in accordance with the methodology and service parameter definitions set out in its SLAs.
- 8.57 ComReg also proposed to remove requirements to provide access to digital end-to-end WLLs, Channelised E1 (2Mb/s) LLs (as distinct from PPC E1 Channelised Links⁵⁴⁸) and Analogue LLs (discussed in paragraphs 8.86 to 8.91 below).
- 8.58 The consideration of and justification for the above access remedies and the withdrawal of obligations is discussed below.

Requirement to provide Access to PPC EULs in the Low Bandwidth TI WHQA Market

- 8.59 In addition to the general obligation to meet reasonable requests for access ComReg proposes, pursuant to Regulation 12 of the Access Regulations, that Eircom should be required to provide access to LB PPC EULs (64Kb/s up to and including 2Mb/s) and associated PPC Transport Link interconnect circuits (further described in paragraphs (8.63 to 8.68 below).

⁵⁴⁸ This service allows Access Seekers to nominate an individual 2Mb/s timeslot on a Transport Link bearer which can be subdivided in order to allow connection to sub 2Mb/s EULs

- 8.60 The access obligations that ComReg proposes to impose here, and elsewhere in this Section, effectively results in a continuation of Eircom's offer of the existing LB TI WHQA products called PPCs, in accordance, with the product descriptions and terms and conditions of supply or use, as specified in the current version of the Eircom's Leased Line Reference Offer ('LLRO')⁵⁴⁹ and Partial Private Circuit Product Description⁵⁵⁰, and in addition, in accordance with the proposed obligations discussed elsewhere in this Consultation.
- 8.61 ComReg's preliminary view is that access to these products is necessary to ensure the development of sustainable and effective downstream competition and to minimise foreclosure concerns that could arise, absent regulation. Otherwise, absent regulation, it is ComReg's preliminary view that given Eircom is a vertically integrated undertaking with SMP in the LB TI WHQA Market, it has the ability and incentive to refuse to provide access to LB TI WHQA products, services and facilities.
- 8.62 For these reasons, ComReg proposes that Eircom should continue to be required, pursuant to Regulation 12(2) of the Access Regulations, to provide access to LB TI WHQA products identified in paragraph 8.60 above.

Requirement to Provide Access to PPC Interconnection Services

- 8.63 Pursuant to Regulation 12(2)(i) and 12(2)(f) of the Access Regulations, ComReg's preliminary view is that Eircom should be required to provide access to a range of specific PPC related Interconnection Services that are associated with the provision of access to LB TI LLs.
- 8.64 Interconnect Services essentially relate to the physical and/or logical connectivity between network aggregation points (typically exchanges or their equivalents) to facilitate the handover of LLs within or between undertakings' networks.
- 8.65 Eircom currently supplies a range of Interconnection Services⁵⁵¹ (referred to as PPC Transport Links) to Access Seekers purchasing PPC EULs pursuant to its existing SMP obligations. The PPC Transport Link variants provided are as follows:
- (a) In-Span Handover ('ISH') which means the connection between the Eircom Exchange or node and the Access Seeker's nominated Point of Handover. In this instance the Access Seekers extends its network to a point close to the Eircom node (this can be in an underground chamber for example).

⁵⁴⁹ Currently LLRO version L dated 1 July 2017, as published on [Eircom's wholesale website](#), as may be amended from time to time and in accordance with the obligations proposed elsewhere in this Consultation. The LLRO is the offer of contract by Eircom to Undertakings in respect of the provision of Wholesale TI LL products, services and facilities.

⁵⁵⁰ The relevant products are described in Eircom's PPC Product Description, as published on http://www.openeir.ie/Products/Data/Partial_Private_Circuits/.

⁵⁵¹ The range of Interconnect Services currently supplied by eircom are described in the LLRO, Service Schedule 001.

- (b) Customer-Sited Handover ('CSH') which means that Eircom provide the transmission path from the Eircom Exchange or node to the Access Seekers premises, without the requirement for the Access Seeker to extend their network.
 - (c) 2Mb/s Transport Links, which are a form of CSH which provide a 2Mb/s connection between Eircom's exchange and the Access Seeker's nominated Point of Handover.
- 8.66 The Transport Link product supports the supply of EULs to Access Seekers and in the context of this review, it is ComReg's preliminary view that the continued imposition of obligations to provide such interconnection products is necessary to enable Access Seekers to purchase and connect to the EULs and thereby to compete in the LB TI LL markets.
- 8.67 For the avoidance of doubt while ComReg is proposing the removal of the obligation to supply wholesale Channelised E1 (2Mb/s) Access services (see further discussion in paragraphs 8.86 to 8.91 below). It is ComReg's preliminary view that Eircom should continue to supply the Channelised E1 link service as part of its Transport Link product. This service allows Access Seekers purchasing Transport Links to nominate an individual 2Mb/s timeslot on the Transport Link bearer which can be subdivided in order to allow connection to sub 2Mb/s EULs. (Eircom are also obliged to continue the provision of 2Mb/s Transport Links as described in paragraph 8.65)
- 8.68 Absent regulation, ComReg considers that Eircom would have the ability and incentive to leverage its SMP position in the LB TI WHQA Market by denying (outright or constructive) access to the Interconnection Services described above or by acting in a discriminatory manner (say through offering preferential terms and conditions, including prices, to one group of purchasers over another).

Requirement to negotiate in good faith

- 8.69 Pursuant to Regulation 12(2) (b) of the Access Regulations, ComReg proposes to impose an obligation on Eircom to negotiate in good faith with undertakings requesting access to LB TI WHQA products, services and facilities. Having regard to the competition problems identified in Section 7, ComReg considers this measure to be proportionate and justified in order to ensure that genuine bona fide negotiations take place between Eircom and Access Seekers in relation to access (particularly given the identified competition problem that Eircom has the ability and incentive to expressly or constructively refuse to provide access to LB TI WHQA products, services and facilities). It will also somewhat address imbalances between the bargaining powers of the respective parties in the negotiation process by reducing incentives to unnecessarily prolong negotiations and should facilitate a more efficient and effective consideration of reasonable requests for access and provision of such access. Overall, an obligation to negotiate in good faith will support the provision of efficient and effective access to LB TI WHQA products, services and facilities, thereby promoting the development of effective wholesale and, ultimately, retail competition.

8.70 ComReg also notes that the obligation to negotiate in good faith implies that the responsibility rests with Eircom to demonstrate that its approach to negotiations with undertakings was in good faith and that any unmet access requests can be shown to be unreasonable by reference to objective criteria. In this regard, recital 19 of the Access Directive states with respect to requests for access to SMP undertakings that:

“...such requests should only be refused on the basis of objective criteria such as technical feasibility or the need to maintain network integrity.”

8.71 ComReg, therefore, proposes that should an access request be refused, or only partially met, then the objective criteria for refusing same should be provided by Eircom to the requesting Access Seeker at the time of refusal. This will also improve regulatory effectiveness, efficiency and transparency should any complaint or dispute be raised with ComReg, as it will provide a useful audit trail for compliance-monitoring purposes.

8.72 In ComReg’s view, this remedy does not impose any significant additional burden on Eircom beyond that which would normally be expected to occur in circumstances involving fair commercial negotiations between parties.

Requirement not to withdraw access to facilities already granted

8.73 Pursuant to Regulation 12(2)(c) of the Access Regulations, ComReg proposes to impose an obligation on Eircom not, without the prior approval of ComReg, to withdraw access to facilities already granted. For the avoidance of doubt, this does not mean there are no objectively justified circumstances for withdrawing access to LB TI WHQA products, services and facilities (such as the unjustified non-payment of wholesale charges), however, this would have to be considered on the basis of the facts of the particular circumstances governing the proposed withdrawal of access.

8.74 Having regard to the competition problems identified in Section 7, ComReg is of preliminary view that Eircom would have the ability and incentive to delay, withdraw or refuse access to LB TI WHQA products, services and facilities, either outright or constructively, resulting in restrictions and/or distortions in competition to the detriment of consumers. ComReg considers that the proposed remedy, requiring Eircom to seek ComReg’s approval prior to any withdrawal of access, will promote regulatory certainty for all parties without unduly restricting investment incentives.

8.75 More specifically, ComReg proposes that Eircom should notify ComReg, in writing, of any proposal to withdraw access to facilities already granted, giving detailed reasons for the proposal, including the impacts that the withdrawal of access is likely to have on existing purchasers of LB TI WHQA products, services and facilities purchasers. Where Eircom proposes to withdraw services, ComReg would retain the right to consult with relevant parties, prior to making a decision on whether to grant or to withhold its approval. ComReg also notes that within the period of this review it is possible that Eircom may seek to put in place a programme to commence the retirement of its copper infrastructure. Any such programme would be considered by ComReg having regard to the principles to be established on foot of ComReg's finalisation of the issues subject to the 2016 Copper Network Transition Consultation⁵⁵².

Requirement to grant open access to technical interfaces, protocols and other key technologies

8.76 Pursuant to Regulation 12(2)(e) of the Access Regulations, ComReg proposes to impose an obligation on Eircom to grant open access to technical interfaces, protocols and other key technologies that are indispensable for the interoperability of LB TI WHQA products, services and facilities. Having regard to the competition problems identified Section 7, ComReg considers that this remedy is both justified and proportionate in order to ensure that, in the context of the provision of access to Low Bandwidth TI WHQA products, services and facilities, interoperability of networks and services is ensured.

Requirement to provide access to OSS or similar software systems necessary to ensure fair competition in the provision of services

8.77 Access to Eircom's Operational Support Systems ('OSS')⁵⁵³ plays an important role in the provisioning and service assurance of wholesale services for Access Seekers and for Eircom's retail business as access to OSS is essential to the effectiveness and efficiency of the supply of the products, services and facilities that are used as inputs to the supply of LB TI LL to end-users (or other wholesale customers).

8.78 In the absence of Access Seekers being able to gain effective and efficient access to Eircom's OSS, they would likely be at a significant competitive disadvantage relative to Eircom's own downstream businesses in providing retail LB TI LLs. Having regard to the competition problems discussed in Section 7, ComReg considers that this remedy is needed to support Eircom's general access obligation because Eircom has the ability and the incentives to impede access to its OSS in order to leverage its market power into downstream and adjacent markets.

⁵⁵² Transition from Eir's copper network, Proposed principles and notification procedures, [ComReg Document 16/01](#), 16 January 2016 ('**2016 Copper Network Transition Consultation**').

⁵⁵³ Operational Support Systems in the context of Eircom relates to various computer systems used by eircom on the provision of and service assurance for various products.

- 8.79 As such, pursuant to Regulation 12(2)(h) of the Access Regulations, ComReg proposes to impose an obligation on Eircom to provide access to OSS or similar systems to ensure fair competition in the provision of services.

Requirements governing fairness, reasonableness and timeliness of access

- 8.80 As noted in Section 7, ComReg considers that Eircom has the ability and incentive to constructively refuse to supply access (including delay or other behaviours which have the effect of raising rivals' costs) to LB TI WHQA products, services and facilities by engaging in non-price leveraging behaviours.
- 8.81 ComReg's preliminary view is that pursuant to Regulation 13(3) of the Access Regulations, certain conditions should, therefore, be attached to Eircom's proposed access obligations in order to ensure that access to LB TI WHQA products, services and facilities are provided in a fair, reasonable and timely manner. Such conditions should also ensure consistency in the treatment of requests for access. ComReg considers that this remedy will ultimately contribute to the development of sustainable competition, to the ultimate benefit of consumers.
- 8.82 ComReg therefore proposes to include requirements obliging Eircom to conclude SLAs in respect of the LB TI WHQA products, services and facilities provided. This requirement is specified in more detail below, namely that ComReg proposes that Eircom is required:
- (a) to conclude, maintain or update, as appropriate, legally binding SLAs with Access Seekers;
 - (b) to ensure that the SLAs include provision for service credits to be provided by Eircom to Access Seekers in the event that committed service levels are not met;
 - (c) to ensure that SLAs detail the methodology for the calculation of service credits and also include the provision of an example calculation;
 - (d) to ensure that the application of Service Credits, where they occur, is applied automatically, and in a timely and efficient manner;
 - (e) to ensure that the level of the Service Credits are fair and reasonable;
 - (f) to ensure that the SLAs include performance metrics, the latter being the measure of performance levels to be achieved by Eircom within a specified period, as calculated in accordance with the methodology and service parameter definitions set out in its SLAs; and
 - (g) to negotiate in good faith with Access Seekers in relation to the conclusion of legally binding and fit-for-purpose SLAs.
- 8.83 ComReg also proposes to set as a condition of access that Eircom should comply with a set of key performance indicators ('KPIs') to ensure Eircom is delivering products, services, features or facilities that are fit for purpose. This is discussed in more detail in paragraphs 8.138 to 8.144 below.

- 8.84 SLAs and KPIs are intended to allow for efficient access to LB TI WHQA products, services and facilities. As such, it will help minimise the risk of Eircom engaging in actual or constructive refusal to supply. Ultimately, this will support the aim of ensuring fair competition in the provision of services by allowing Access Seekers to compete on a level playing field with Eircom.
- 8.85 The majority of the above conditions are currently imposed upon Eircom through its existing regulatory obligations as principally imposed in the 2008 Decision and the 2011 KPI Decision. These proposed obligations should:
- (a) encourage Eircom to achieve acceptable levels of service performance in the provision of services to Access Seekers and to ensure that a level playing field is created in terms of the access provided by Eircom to Access Seekers and that which is self-supplied;
 - (b) ensure that Eircom engages in genuine bona-fide negotiations with Access Seekers when seeking to agree appropriate SLAs;
 - (c) provide assurances to Access Seekers surrounding the levels of service provided by Eircom so that they are, in turn, able to offer service assurances to their own customers (and prospective customers);
 - (d) ensure that Eircom is adequately incentivised to achieve the targets set out in its SLAs by ensuring that any service credits to be paid by Eircom to Access Seekers are fair and reasonable;
 - (e) establish performance metrics against which the standards of performance achieved by Eircom can be readily measured and compared; and
 - (f) hold Eircom accountable for its committed service levels by establishing a mechanism for Access Seekers to receive service credits where service levels are not achieved by Eircom.

Proposed withdrawal of certain existing Wholesale TI LL access remedies

- 8.86 In paragraph 8.29 above, ComReg has already discussed the potential removal of the obligations to supply Wholesale LL and Channelised E1 (2MB) Access services for TI digital end-to-end WLLs up to and including 2Mb/s. For the avoidance of doubt, this does not refer to PPC E1 Channelised Links required to deliver sub-2Mb/s EUL LLs. This proposed withdrawal refers specifically to Eircom's wholesale's digital end-to-end WLL product for bandwidths from 64Kb/s up to and including 2Mb/s and "Channelised E1 Access" products for bandwidths $N \times 64\text{Kb/s}$ (where N can be from a value of 1 up to 31).

- 8.87 ComReg is of the preliminary view that the requirement to provide a PPC variant of these products is sufficient to ensure a competitive alternative to Eircom's TI Digital retail LLs. An SP can enter the market by interconnecting with a Transport Link in one location and purchasing EULs from Eircom. All Access Seekers who would wish to provide a LB TI LL service (either at wholesale and/or retail level) are interconnected with Eircom for voice services using TDM based interconnection at the Tertiary Exchange⁵⁵⁴ level and these interconnects could be used to connect PPC EULs. There is therefore no significant barrier to Access Seekers gaining access to the PPC remedy in the LB WHQA Market.
- 8.88 However, the obligation to provide access to wholesale Analogue Leased Lines is to be withdrawn.
- 8.89 As discussed in paragraph 8.28 ComReg is also of the view that an obligation to provide a wholesale Analogue LL product is not warranted or reasonable in the current circumstances of the market. (It follows logically that a requirement to provide a wholesale Analogue EUL, were it technically possible to do so, is not warranted or justified and ComReg does not intend to impose obligations requiring the provision of such).
- 8.90 ComReg is also proposing to withdraw the obligation to provide in-situ transfer of end to end LLs. This obligation was designed to facilitate the transfer of customers between SPs to foster the development of competition. Given the proposal to remove the requirement to provide end-to-end wholesale digital LLs due to the low number of lines being sold by Eircom to SPs, ComReg is of the preliminary view that this remedy is no longer required. In addition, Eircom's wholesale price list is currently offering zero installation/connections charge until the end of 2016.⁵⁵⁵ As such, SPs can replicate a rival operator's in-situ TDM digital service without incurring any additional charge. For these reasons, ComReg considers that this obligation is no longer proportionate.
- 8.91 Should ComReg eventually decide that these obligations should not be re-imposed, then these remedies would be withdrawn, most likely over a 'sun-set' or withdrawal period of 6 to 9 months in order to facilitate purchasers making any necessary adjustments at the wholesale and/or retail level. This is to avoid possible situations where end-users could be disconnected due to the proposed removal of access obligations amongst others, and to allow Access Seekers a sufficient period in which to make other arrangements. This would provide adequate time for Access Seekers to negotiate commercial contracts with Eircom and/or alternate suppliers or to connect customers directly using their own networks.

⁵⁵⁴ Tertiary Exchange refers to exchanges at the highest level of the PSTN (Public Switched Telephone Network).

⁵⁵⁵ End User Link price list, Table 1 of Eircom's Network Price list– Connection and Paper Migration Fees - From 1st July 2015 to 31st December 2016 as published on www.openeir.ie.

Overall Summary of Preliminary Conclusions on Access Obligations

- 8.92 Having regard to the analysis set out in paragraphs 8.36 to 8.91 above, ComReg's preliminary view is that proposed access obligations are proportionate and justified. The proposed specific requirements include:
- (a) to meet reasonable requests for access to LB TI WHQA products, services and facilities;
 - (b) to provide access to specific LB TI WHQA products, namely PPC EULs in the bandwidth range 64Kb/s up to and including 2Mb/s;
 - (c) to provide access to specific Interconnection Services, namely PPC Transport Links (including ISH and CSH variants);
 - (d) to negotiate in good faith with undertakings requesting Access;
 - (e) not to withdraw Access to facilities already granted without the prior approval of ComReg;
 - (f) to grant open access to technical interfaces, protocols or other key technologies that are indispensable for the interoperability of products, services or facilities;
 - (g) to provide access to specified information which supports existing and future wholesale leased lines;
 - (h) to provide access to OSS or similar software systems necessary to ensure fair competition in the provision of services, and
 - (i) to provide access in accordance with a range of conditions governing fairness, reasonableness and timeliness.
- 8.93 ComReg has also proposed to withdraw existing access obligations in relation to Wholesale digital end-to-end LLs, Wholesale E1 Channelised E1 (2MB) Access service and Wholesale Analogue LLs.

Non-Discrimination Remedies

Overview

- 8.94 The application of an *ex ante* non-discrimination remedies seeks to prevent a dominant, vertically-integrated undertaking from engaging in discriminatory (price or non-price) behaviour that could hinder the development of sustainable and effective competition in wholesale and retail markets.
- 8.95 In Section 7 ComReg identified that, absent regulation, Eircom has the ability and incentive to engage in behaviours that could adversely impact upon downstream competition and consumers. For example, Eircom could offer LB TI WHQA products, services and facilities at discriminatory prices, terms and conditions, and service/repair quality to different Access Seekers or between Access Seekers and its own downstream arm.

- 8.96 As noted in the Access Directive⁵⁵⁶, the principle of non-discrimination is designed to ensure that undertakings with market power do not distort competition, in particular, where they are vertically integrated undertakings that supply services to undertakings with whom they compete on downstream markets.
- 8.97 Regulation 10 of the Access Regulations provides that ComReg can impose non-discrimination remedies in relation to access or interconnection on an undertaking designated with SMP, in particular to ensure it behaves in such a way that it:
- (a) applies equivalent conditions in equivalent circumstances to other undertakings providing equivalent services; and
 - (b) provides services and information to others under the same conditions and of the same quality as it provides for its own services or those of its subsidiaries or partners.
- 8.98 In this respect, non-discrimination obligations can be standalone, but can also support other obligations such as those relating to access, transparency and price control.
- 8.99 An overview of existing non-discrimination obligations is set out in paragraph 8.18 above.

Proposed Non-Discrimination Remedies

- 8.100 ComReg is proposing to continue to impose general non-discrimination obligations on Eircom in order to address identified competition problems that could arise in the LB TI WHQA Market and adjacent markets.

General non-discrimination remedies

- 8.101 ComReg is proposing to require that Eircom:
- (a) applies equivalent conditions in equivalent circumstances to other Undertakings requesting, or being provided with Access (including Access to LB TI WHQA products, services and facilities) or requesting or being provided with information in relation to such Access; and
 - (b) provides access (including access to LB TI WHQA products, services and facilities) and information to all other Undertakings under the same conditions and of the same quality as Eircom provides to itself or to its subsidiaries, affiliates or partners.

⁵⁵⁶ Recital 17 of the Access Directive.

- 8.102 For the avoidance of doubt, it is ComReg's view that the non-discrimination obligations above should apply irrespective of whether or not a specific request for services or information has been made by an undertaking to Eircom. For example, if information or a service is provided by Eircom following a request from one undertaking, Eircom is obliged to offer this to other undertakings, notwithstanding that such other undertakings have not made a request for it (or known to make a request for it). This is to ensure fair treatment of all undertakings.
- 8.103 These obligations are intended to ensure that Eircom does not favour its downstream arm, or unduly favour any particular Access Seeker in the provision of LB TI WHQA products, services and facilities such that it might otherwise restrict or distort competition in this market or any downstream or adjacent market, ultimately impacting on the development of sustainable retail competition.

Specification of the non-discrimination standards with respect to the provision of Low Bandwidth TI WHQA

- 8.104 ComReg also proposes that the non-discrimination obligations should be applied on, at least, an Equivalence of Outputs ('**EOO**')⁵⁵⁷ standards basis. When Eircom provides Access Seekers with access to LB TI WHQA products, services and facilities, including access to information, Eircom would be required to do so in a manner which achieves the same standards in terms of functionality, price, terms and conditions, service and quality levels as Eircom provides to itself, albeit potentially using different systems and processes.
- 8.105 ComReg considers that this EOO standard is appropriate in the context of LB TI WHQA products, services and facilities, particularly given that the existing provision of LB TI WHQA products, services and facilities is largely over a legacy network and legacy systems. ComReg considers that adopting an Equivalence of Inputs ('**EOI**')⁵⁵⁸ standard would not be proportionate at this time. In particular, the OSS and wholesale interfaces that are in place and used for the provision of Eircom's suite of existing legacy LB TI WHQA products, services and facilities have already been developed. These OSS and wholesale interfaces would require likely substantial investment in order to upgrade or replace them to meet an EOI standard. This would not be justifiable or proportionate in the circumstances of the LB TI WHQA Market as it would likely involve costly systems re-development, the incremental benefits of which would not likely be substantial.

⁵⁵⁷ Equivalence of Outputs ('**EOO**') essentially refers to provision of products, services, facilities, and information by an SMP undertaking to Access Seekers such that such products, services, facilities, and information is provided to Access Seekers in a manner which achieves the same standards in terms of functionality, price, terms and conditions, service and quality levels as the SMP undertaking provides to itself, albeit potentially using different systems and processes.

⁵⁵⁸ Equivalence of Inputs ('**EOI**') essentially refers to provision of products, services, facilities, and information by an SMP undertaking to Access Seekers such that such products, services, facilities, and information is provided to Access Seekers in a manner which achieves the same standards in terms of functionality, price, terms and conditions, service and quality levels as the SMP undertaking provides to itself, and using the same systems and processes.

8.106 ComReg anticipates, that the EOO standard could be adopted in the LB TI WHQA Market without a significant additional cost burden being placed on Eircom, while at the same time addressing potential discriminatory concerns in a proportionate manner.

Transparency Remedies to Support Non-Discrimination

8.107 As discussed later in paragraphs 8.138 to 8.144, ComReg is proposing to impose a requirement on Eircom to publish a specific set of KPIs relevant to the LB TI WHQA Market on its public website in accordance with the existing requirements as set out in the 2011 KPI Decision remedies (subject to modifications discussed later). KPIs can support the monitoring of non-discrimination obligations and, in so doing, provide assurances to Access Seekers regarding the levels of service provided by Eircom to its downstream arm relative to that provided to Access Seekers. It also facilitates ComReg in fulfilling its role in monitoring the markets.

8.108 ComReg is proposing to modify the transparency requirement taking in to account the current dynamics in the LB TI WHQA market. This modification is discussed in paragraphs 8.138 to 8.144 below.

Summary of Preliminary Conclusions on Non-Discrimination Obligations

8.109 Having regard to the analysis set out in paragraphs above in paragraphs 8.94 to 8.108 above, ComReg's preliminary view is that proposed non-discrimination obligations are proportionate and justified.

8.110 ComReg's preliminary view is that there is a need to continue the imposition of non-discrimination obligations on Eircom for the supply of LB TI WHQA products, services and facilities, in particular Eircom is to be required to:

- (a) apply equivalent conditions in equivalent circumstances to other Undertakings requesting, or being provided with Access (including Access to LB TI WHQA products, services and facilities) or requesting or being provided with information in relation to such Access; and
- (b) provide access (including access to LB TI WHQA products, services and facilities) and information to all other Undertakings under the same conditions and of the same quality as Eircom provides to itself or to its subsidiaries, affiliates or partners.

8.111 ComReg also proposes that the non-discrimination obligations above should be applied on, at least, an EOO standards basis.

Transparency Remedies

Overview

- 8.112 Regulation 9 of the Access Regulations provides that ComReg may, inter alia, specify obligations to ensure transparency in relation to access or interconnection requiring an SMP undertaking to make public specified information such as accounting information, technical specifications, network characteristics, prices, and terms and conditions for supply and use, including any conditions limiting access to or use of services and applications where such conditions are permitted by law.
- 8.113 Transparency obligations can be standalone, but can also support other obligations being imposed and usually relate to requirements to make specified information publicly available.
- 8.114 An overview of existing transparency obligations is set out in paragraph 8.19 to 8.21 above.

Proposed Transparency Remedies

- 8.115 In Section 7, ComReg identified that Eircom has the ability and incentive to engage in a range of exploitative and exclusionary behaviours which can impact adversely on competition and consumers.
- 8.116 A transparency obligation is considered necessary in order to monitor and ensure the effectiveness of any access, non-discrimination, (and other obligations such as price control) as it allows ComReg to monitor the compliance of an SMP Operator's pricing and other behaviour (such as with respect to terms and conditions of use, quality or technical parameters) with non-discrimination and access obligations, and to address potential competition problems relating to price or quality discrimination.
- 8.117 Apart from the above, as noted in the Access Directive⁵⁵⁹, transparency of terms and conditions for access and interconnection, including prices, also serve to speed-up negotiations between undertakings, avoid disputes and give confidence to market players that a service is not being provided on discriminatory terms. Openness and transparency of technical interfaces can also be particularly important in ensuring interoperability. Transparency on prices (and changes to them) is also likely to provide the necessary clarity to Access Seekers in order that they can consider impacts on the structure or level of retail prices. Transparency also provides the means for Eircom to demonstrate that access to LB TI WHQA products, services and facilities is being provided in a non-discriminatory manner.

⁵⁵⁹ Recital 16 of the Access Directive.

- 8.118 ComReg therefore considers that Eircom should be required to comply with a range of transparency obligations in order to minimise information asymmetries and facilitate effective access to LB TI WHQA products, services and facilities and to ultimately promote effective competition in downstream and related markets.
- 8.119 ComReg also proposes that Eircom should be required, as specified by ComReg in writing from time to time, to make public on its publicly available wholesale website, information that may be reasonably requested by ComReg that is relevant to the provision of LB TI WHQA products, services and facilities such as accounting information, technical specifications, network characteristics, terms and conditions for supply and use, and prices. This allows ComReg to proactively intervene in specific cases where it considers that transparency is lacking regarding the provision of information in relation to LB TI WHQA products, services and facilities, notwithstanding the standard transparency measures proposed above being in place.
- 8.120 Additionally, at a specific level, ComReg proposes that Eircom should be required to:
- (a) publish a Leased Line Reference offer ('**LLRO**') and a price list which should contain a minimum specified set of details, including prices; these prices should be sufficiently unbundled so that Access Seekers are not required to pay for services that are not requested; and be subject to a transparent change management process, including advance public notification of proposed changes to products and prices;
 - (b) provide, in accordance with specified timeframes, advance notification to Access Seekers and to ComReg of proposed changes to the LLRO and to prices;
 - (c) to publish on its publicly available website KPIs, and SLAs relating to LB TI WHQA products, services and facilities; and
 - (d) meet requirements concerning access to confidential and/or commercial information.
- 8.121 These obligations largely mirror those imposed under the 2008 Decision, the 2011 KPI Decision, 2011 Access and Transparency Decision and subsequent decisions.
- 8.122 ComReg also notes that, pursuant to regulation 9(3) of the Access Regulations, it can issue directions requiring Eircom to make changes to the LLRO to give effect to obligations imposed by ComReg, and to publish the LLRO with such changes. Eircom must comply with any such directions made by ComReg.
- 8.123 These and other proposed remedies are discussed in more detail below.

Transparency requirements concerning LLRO and Price Changes

- 8.124 ComReg proposes that Eircom should make publicly available and keep updated on its website, an LLRO, which should contain a specified minimum list of items. The key purpose of the LLRO is to provide current or potential Access Seekers with all relevant information about the LB TI WHQA products, services and facilities that are or are intended to be provided by Eircom.

- 8.125 More specifically, ComReg considers that the LLRO should include at least the following items:
- (a) A description of the offer of contract for access broken down into components according to market needs;
 - (b) A description of any associated contractual or other terms and conditions for supply of access and use, including prices, (the latter being a '**Network Price List**');
 - (c) A description of the technical specifications and network characteristics of the access being offered; and
 - (d) The terms, conditions, service level agreements, guarantees and other product related assurances associated for LB TI WHQA products, services and facilities.
- 8.126 Overall, the proposed obligations are largely consistent with existing obligations which ComReg considers are not unduly burdensome and are required for the efficient and effective operation of the market.
- 8.127 In order to address the concerns discussed above, ComReg considers it important that both it and Access Seekers have visibility over the non-pricing and pricing terms and conditions associated with Eircom's LB TI WHQA products, services and facilities, thereby supporting the effective monitoring and enforcement of Eircom's access, non-discrimination, pricing and other obligations and enabling Access Seekers to make purchasing decisions in a timely manner.
- 8.128 Apart from the above, ComReg also considers that the LLRO and Network Price List should be sufficiently unbundled so as to ensure that Access Seekers are not required to pay for products, services or facilities which are not necessary for the Access requested.
- 8.129 ComReg considers that the format of the LLRO and the price list should be based on the versions that are currently published⁵⁶⁰ on Eircom's wholesale website (or at the date on which ComReg's decision concerning its LB TI WHQA market analysis is published), thereby continuing the current practice.

Transparency requirements governing LLRO change management

- 8.130 ComReg also proposes to impose various transparency requirements governing change management of the LLRO and its associated elements/documentation in order to enable Access Seekers to have visibility of any changes to be made or made to the LLRO over time. This will also support monitoring and enforcement of compliance with SMP obligations.
- 8.131 In this respect, ComReg proposes that Eircom should:

⁵⁶⁰ The current version of Eircom's LLRO at [http://www.Eircomwholesale.ie/Reference-Offers/LLRO/\(Version L dated 1 July 2015\)](http://www.Eircomwholesale.ie/Reference-Offers/LLRO/(Version L dated 1 July 2015)).

- (a) publish and keep updated on its public website both clean (or unmarked) and tracked changed (or marked) versions of its LLRO. The tracked change version of the LLRO must also be sufficiently clear to allow Access Seekers to clearly identify all actual and proposed amendments to regulated products from the preceding version of its LLRO.
- (b) publish and keep updated on its public website an accompanying LLRO change matrix which lists all of the amendments incorporated to regulated products or to be incorporated in any amended LLRO (the '**LLRO Change Matrix**').
- (c) publish and keep updated on its publicly available website both clean (unmarked) and tracked changed (marked) versions of the Network Price List(s) for LB TI WHQA products. The tracked change version of the Network Price must also be sufficiently clear to allow Access Seekers to clearly identify all actual and proposed amendments from the preceding version of its Network Price List of regulated products.
- (d) publish and keep updated on its publicly available website a Network price list change matrix, which lists all of the amendments incorporated to regulated products or to be incorporated in any amended Network Price List (the '**Price List Change Matrix**').

8.132 Eircom shall also maintain and keep publicly available historic versions of the above documents.

Advance notification timeframes for LLRO and price changes

8.133 ComReg proposes to impose obligations upon Eircom to provide advance notification of proposed amendments or changes to the LLRO and related prices according to specified timeframes. This is to provide sufficient notification to Access Seekers to allow them to factor in such proposed changes into the commercial decision making activities and to make any necessary adjustments or developments to billing or other systems, as appropriate. These advance notification requirements also provide a transparent and available mechanism according to which ComReg can monitor compliance by Eircom with its access, non-discrimination, pricing and other obligations proposed in this Consultation.

8.134 ComReg proposes that Eircom should be subject to the following obligations with respect to changes to the LLRO and the Network Price List:

- (a) Eircom shall (unless otherwise agreed by ComReg) publish, on its publically available website - at least three months in advance - any proposed changes to the LLRO and any proposed changes to Wholesale prices and the application of such prices for the purposes of notifying all interested parties of such changes.
- (b) Eircom shall notify ComReg at least five days in advance of any such publication taking place. This period of five days may be varied from time to time with the agreement of ComReg.

8.135 The above transparency requirements require Eircom to notify ComReg in the event of text changes to the LLRO or changes to prices. However, it should be noted that this notification does not include an approvals process. For the avoidance of doubt, in relation to existing contracts, text changes proposed by Eircom, arising from the text change process as detailed above, apply to Eircom's obligations only and are not automatically incorporated into existing contracts, as changes to Access Seeker contractual obligations. Eircom may negotiate with Access Seekers regarding any such changes.

Transparency requirements on wholesale billing

8.136 ComReg proposes to require Eircom to provide transparency in its billing charges for wholesale LB TI WHQA products, services and facilities to its wholesale customers, and to ensure that its wholesale invoices for such are sufficiently disaggregated, detailed and clearly presented so that an Access Seeker can reconcile the invoice to Eircom's LLRO and Network Price Lists.

8.137 This should ensure that Access Seekers have the clear ability to monitor the wholesale charges being levied on them and facilitate an auditable means of detecting any billing anomalies and/or non-compliance with regulatory obligations. Eircom should therefore, continue in its LLRO, the requirement to invoice OAOs on a monthly basis, one month in advance of provision of the service with the credit terms remaining at 30 days.

Transparency requirements regarding KPIs and SLAs

8.138 In the context of non-discrimination remedies discussed in paragraphs 8.107 and 8.108 above, KPIs and SLAs can support the monitoring of non-discrimination obligations and, in so doing, provide assurances to Access Seekers regarding the levels of service provided by Eircom to its downstream arm relative to that provided to Access Seekers.

8.139 ComReg is therefore proposing to require Eircom to continue to publish KPIs and SLAs. However ComReg is proposing to amend the current requirement on Eircom to publish KPIs on its public website with respect to service assurance for LB TI WHQA products, services and facilities in accordance with the existing requirements as set out in the 2011 KPI Decision.

8.140 The requirements regarding KPIs were specified in the 2011 KPI Decision which specified a range of Metrics for various categories of LLs against which Eircom would report. Given the preliminary findings with respect to SMP (or no SMP) in the Relevant WHQA Markets market, ComReg proposes that Eircom will no longer be required to publish metrics for the MI LLs or for HB LLs and the 2011 KPI Decision would be amended accordingly. ComReg therefore, proposes to remove all the current metrics specific to LLs in Annex 4 of the 2011 KPI Decision (Metrics 5.1.1 to 5.3.18) and corresponding tables 5, 6,7,8 and 9 contained in Appendix 2 of D05/11 and replace these with the new Metrics and new Table 15 below:

Table 15: Repair of LB TDM LLs

Metric Reference	Title			Definition		
5.1.1 to 5.1.3	Percentages of fault on PPC EULs of bandwidths up to 2Mb/s, repaired within 8, 24 and after 24 hours (excludes non-faults and co-op faults)			Percentage of faults (excludes non-faults and co-op faults) reported on PPC EUL's ≤2Mb/s repaired within 8, 24 and after 24 hours, of all faults reported, measured on a quarterly basis		
5.1.4 to 5.1.6	Percentages of fault on retail digital TDM leased lines of bandwidths up to 2Mb/s, repaired within 8, 24 and after 24 hours (excludes non-faults and co-op faults)			Percentage of faults (excludes non-faults and co-op faults) reported on retail digital TDM leased lines ≤2Mb/s reported, repaired within 8, 24 and after 24 hours, of all faults reported, measured on a quarterly basis		
	Retail			Wholesale (PPCs)		
Metrics associated with fault repair	<8WHs	<24 WHs	>24WHs	<8WHs	<24 WHs	>24WHs
43. Low Bandwidth (≤2M) TDM leased lines	%	%	%	%	%	%

- 8.141 With respect to the wholesale TI LLs ComReg is proposing to modify the current obligation taking into account the current dynamics in the market as follows.
- 8.142 The monthly volumes of LB TI WHQA LL orders are not currently of a volume that comparisons of performance between wholesale supply and retail supply would be meaningful. ComReg is therefore proposing to remove the obligation to provide KPIs with respect to the provision of LB TI WHQA LLs (including therefore, those relating to order designation).
- 8.143 ComReg is also proposing that the interval of measurement of 'Service Assurance Metrics' for LB TI WHQA LLs would change from monthly to quarterly, with the report continuing to be published on a quarterly basis.
- 8.144 This KPI remedy is justified as it provides confidence to Access Seekers that Eircom's performance in the supply of LB TI WHQA products, services and facilities will be measured against relevant performance indicators in a transparent way and therefore supports the non-discrimination and access obligations.

Transparency requirement to facilitate the legitimate sharing of confidential and/or commercial information through a non-disclosure agreement

- 8.145 ComReg also considers that Eircom, as the proposed SMP operator should be required to provide information regarding technical developments, network rollout and wholesale services, insofar as it affects the provision of LB TI WHQA products, services and facilities (subject to the proposed obligations set out in this Consultation) and to do so with sufficient visibility to ensure that operators are in a position to prepare business or operational plans.
- 8.146 In this respect, ComReg would note that in some cases circumstances may arise where Eircom considers that certain information to be provided by it pursuant to its non-discrimination obligations is of a confidential and/or commercially sensitive nature. To cater for such circumstances, ComReg proposes to require Eircom to meet the following requirements, which largely mirror those which have been recently imposed in other markets within which Eircom has SMP.
- (a) Eircom shall, without delay, provide ComReg with complete details of such information along with objective reasons justifying why it considers it is confidential and/or commercially sensitive. ComReg will consider the information in accordance with its Confidentiality Guidelines⁵⁶¹ as relevant or otherwise. If ComReg considers that the information is not confidential and/or commercially sensitive, it shall be published by Eircom in accordance with its obligations proposed in this paragraph (including the subsections).
 - (b) If ComReg concludes that the information in (a) above is confidential and/or commercially sensitive, Eircom shall publish general details which of itself is not considered confidential as to the nature of such information and shall make it available to an Access Seeker that has signed a Non-Disclosure Agreement ('NDA') the terms and conditions of which shall be fair, reasonable and non-discriminatory. The NDA shall also be published on Eircom's publicly available website. Any confidential and/or commercially sensitive information shall not be made available by Eircom to its downstream operations until such time as it is made available to an Access Seeker, or as otherwise agreed with ComReg.
 - (c) If and when the commercially sensitive and/or confidential information becomes no longer commercial sensitivity and/or confidential, it shall be made available by Eircom on its publicly available wholesale website without undue delay and without the need for an NDA to be signed.
- 8.147 This obligation is considered necessary to ensure that Eircom cannot circumvent compliance with its access, non-discrimination and transparency obligations on the grounds that it considers that certain information is commercially sensitive and/or confidential.

⁵⁶¹ See "Guidelines on the treatment of confidential information" ComReg Document 05/24, March 2005.

Summary of Preliminary Conclusions on Transparency Obligations

- 8.148 Having regard to the analysis set out in paragraphs 8.112 to 8.147 above, ComReg's preliminary view is that proposed transparency obligations are proportionate and justified.
- 8.149 ComReg's preliminary view is to continue the imposition of a Transparency obligation on Eircom in the LB TI WHQA Market for LLs in the bandwidth range 64Kb/s to and including 2Mb/s by introducing an:
- (a) Obligation to publish and maintain a LLRO;
 - (b) Obligation to publish and maintain a Network Price list for the products in scope;
 - (c) Obligation to publish changes to the LLRO and wholesale prices, in advance of their coming into effect, and to notify ComReg in advance of publication;
 - (d) Obligation to publish KPIs subjects to the amendments outlined above;
 - (e) Obligation to publish an SLA; and
 - (f) Requirements governing sharing of confidential and/or commercial information through a non-disclosure agreement.

Price Control Remedies in the Low Bandwidth TI WHQA Market

Overview

- 8.150 In Section 7 ComReg identified that Eircom has the ability and incentive to potentially engage in a range of anti-competitive pricing behaviours to the ultimate detriment to competition and consumers. These included the risk that Eircom could charge excessive prices for LB TI LL products, services and facilities, or that Eircom might impose a margin squeeze in order to leverage its SMP position from the LB TI WHQA Market into adjacent or downstream markets. In view of this, ComReg considers that the imposition of obligations of price control and cost accounting on Eircom is justified.
- 8.151 ComReg has proposed to impose a range of access obligations upon Eircom including (but not limited to) the requirement to provide the following PPC components:
- (a) End User Links; and
 - (b) Transport Links.
- 8.152 ComReg is required to consider whether price control obligations are appropriate for the above and, if so, what type of price control would best meet the regulatory objectives to promote effective competition for the ultimate benefit of end-users.

- 8.153 In Section 7, ComReg set out its view that Eircom has the ability and incentive to set prices at an excessive or inefficient level, which could result in adverse impacts on downstream markets to the ultimate detriment of end-users. In view of that assessment, ComReg considers that the imposition of price control obligations on Eircom with respect to LB TI LL products, services and facilities is both justified and proportionate.
- 8.154 Regulation 13 of the Access Regulations provides that ComReg may, inter alia, impose obligations relating to cost recovery and price controls on an SMP operator. These include (but are not limited to) obligations for cost orientation of prices and obligations concerning cost accounting systems, for the provision of specific types of access or interconnection in situations where a market analysis indicates that a lack of effective competition means that the operator concerned may sustain prices at an excessively high level or may apply a price squeeze to the detriment of end-users.
- 8.155 As noted in paragraph 8.11, in imposing any such obligations, ComReg is also required to:
- (a) take into account the investment made by the SMP operator which ComReg considers relevant and allow such operator a reasonable rate of return on adequate capital employed, taking into account any risks involved specific to a particular new investment network project.
 - (b) ensure that any cost recovery mechanism or pricing methodology that ComReg imposes serves to promote efficiency and sustainable competition and maximise consumer benefits.
- 8.156 Based on the principles set out above, the general purpose of price control and cost accounting obligations are to ensure that prices charged are not excessive (or to not cause a margin squeeze) and promote efficiency and ultimately sustainable retail competition, while maximising consumer benefits. ComReg will consider the case for imposing price control and cost accounting obligations in respect to Eircom's provision of LB TI LL products, services and facilities.

Proposed Price Control Remedies

- 8.157 ComReg's preliminary view is that a price control obligation of cost orientation should apply with respect to the PPC products, service and facilities in the LB TI WHQA Market, based on the derivation of cost oriented tariffs for PPCs. This view is based on the fact that the PPC product is the principle wholesale input required to replicate a LB retail TI LL product.
- 8.158 ComReg is of the preliminary view that it is sufficient to apply the obligation of cost orientation on the PPC product suite in order to provide Access Seekers with cost orientated wholesale inputs, in order to compete in downstream markets which rely on such inputs. The relativity of prices between PPCs (including associated Transport Links), WLLs and equivalent retail offerings are of less importance for a number of reasons:

- (a) TI legacy end-to-end digital LL products are largely purchased by Eircom's own downstream retail business though as noted in Section 5 and 6 this demand has reduced in recent years.
 - (b) The demand for WLL products from other SPs are in decline, with no new net business expected over the remaining lifecycle of this review.
 - (c) As noted in paragraph 8.29 above, the PPC product suite is a sufficient remedy to allow SPs to replicate the end-to-end service which is currently provided by the WLL product.
- 8.159 In summary, ComReg is of the view, supported by the rationale laid out in the remainder of this section below, that the appropriate approach to price control in LB TI WHQA Market with respect to PPC products, service and facilities is through the application of cost orientated tariffs for EULs and associated Transport Links.
- 8.160 With respect to connection charges for such products, ComReg also proposes that these should be cost oriented, namely based on the likely actual costs incurred by Eircom, adjusted for efficiencies, plus a regulated rate of return (based on WACC). The adjustment for efficiencies is to ensure that Eircom is unable to recover inefficiently incurred costs.
- 8.161 The following paragraphs consider the mechanisms required to establish such a price control obligations in the Low Bandwidth TI WHQA Market under the following headings:
- (a) what form of price control is appropriate (discussed in paragraphs 8.165 to 8.194 below);
 - (b) what costing methodology is appropriate (discussed in paragraphs 8.195 to 8.209 below);
 - (c) what cost approach is appropriate (discussed in paragraphs 8.210 to 8.218 below);
 - (d) what cost modelling approach is appropriate (discussed in paragraphs 8.219 to 8.227 below);
 - (e) Cost modelling (discussed in paragraphs 8.228 to 8.248 below);
 - (f) Pricing Approach (discussed in paragraphs 8.249 to 8.255 below); and
 - (g) Duration of the price control (discussed in paragraphs 8.256 to 8.257 to below).

Current Pricing Methodology

- 8.162 Current regulatory price controls which apply to PPC and related interconnection facilities (known as Transport Links) are based on cost orientation. The price control obligation for the PPC product suite within the wholesale terminating segments of LL is currently derived via cost orientation based on two separate BU-LRAIC+ cost models.⁵⁶² Additionally a margin squeeze test applies between WLL prices and those of PPC tariffs, incorporating a contribution to the costs of Transport Links and the costs of a Similarly Efficient Operator (“**SEO**”) using its own network investments to replicate an end to end leased line service in the retail market. This was designed to ensure sufficient margin remained for SPs ascending the ladder of investment.
- 8.163 The pricing methodology used for determining the appropriate current charges for PPCs is set out in the 2012 Pricing Decision.⁵⁶³
- 8.164 The pricing methodology for the PPC product is based on nationally averaged prices given that geographic differences in costs for this product are less relevant than for new build products. PPC EUL and related Transport Link prices were set as maximum prices, with Eircom required to make an application to ComReg to change such prices, nationally or in defined geographical areas, should it identify a need to do so.

Appropriate Form of Price Control

- 8.165 This section now assesses the various potential forms of price control available and whether the current form of price control for the PPC products above remains appropriate over the period of this review.
- 8.166 There are a number of price control options available to ComReg for the PPC product. The relevance and appropriateness of each are discussed below under the following headings:
- (a) **Option 1:** Regulatory Forbearance;
 - (b) **Option 2:** Benchmarking;
 - (c) **Option 3:** Retail Minus;
 - (d) **Option 4:** Margin Squeeze Test; and
 - (e) **Option 5:** Cost Orientation.

⁵⁶² [ComReg Document 12/03](#). Decision D02/12 – Response to Consultation Document No. 11/32 and Final Decision- “Further specification of the Price Control Obligation in the wholesale market for the terminating segment of leased lines” (**2012 Pricing Decision**).

⁵⁶³ *Ibid.*

Option 1: Regulatory Forbearance

- 8.167 This option would mean that there would be no price control obligations imposed on the SMP operator and Eircom (the proposed SMP operator) would be free to set prices for LB TI WHQA products, services and facilities. In this situation, ComReg would have no influence over, for example, the monthly rental prices for PPC products.
- 8.168 ComReg considers that this option is not appropriate for the LB TI WHQA Market for the reasons outlined in Section 7 above including the risks of excessive pricing to the detriment of consumers.

Option 2: Benchmarking

- 8.169 Benchmarking is the process whereby the price of PPC products, services and facilities is set by reference to the price of a comparable service in another country.

- 8.170 Regulation 13(3) of the Access Regulations states in relation to benchmarking:

“The Regulator shall ensure that any cost recovery mechanism or pricing methodology that it imposes under this Regulation serves to promote efficiency and sustainable competition and maximise consumer benefits. In this regard, the Regulator may also take account of prices available in comparable competitive markets”

- 8.171 This approach tends to be adopted by NRAs when there is an absence of sufficient data (e.g. on costs, volumes, etc.) to allow the NRA to arrive at a suitably informed price. Given LB TI WHQA product volumes are in slow decline and costs associated with the residual numbers of these products may be non-representative. Costs associated with LB TI WHQA services infrastructure contained in the accounting records of SPs can also be distorted by a number of factors, including:
- (a) Low product volumes in conjunction with high residual costs can indicate unrepresentative unit cost profiles;
 - (b) Assets directly associated with TI LL infrastructure may be fully depreciated also distorting the average unit costs for TI LL;
 - (c) Costs associated with small numbers of TI LL may become so immaterial relative to other business activities of SPs that the business integrates the costs and revenues for such products into the activities of more material product groups; and
 - (d) The inability of SPs to establish current cost values for legacy infrastructural elements which are no longer supplied by manufacturers.
- 8.172 This may be further compounded by factors such as the stage of development of next generation services and the ability of such modern alternatives to provide comparable services (although as noted in Section 5, ComReg’s preliminary view is that MI LLs fall within a separate market) .

- 8.173 ComReg, with the assistance of external consultants,⁵⁶⁴ has already commenced modelling cost and volume data in relation to the PPC EUL and TL product set and attendant services. This cost model is considered by ComReg to be a robust and effective BU-LRAIC+ cost model that is representative of appropriate and efficient costs incurred by Eircom.
- 8.174 Therefore, ComReg is of the preliminary view that benchmarking is not an appropriate approach to set prices for LB TI WHQA products, services and facilities, including PPC prices or the prices for Transport Links.

Option 3: Retail Minus

- 8.175 In general, a retail-minus price control determines the appropriate margin between the wholesale charge and the related downstream retail prices by considering what proportion of retail and other downstream costs would need to be deducted from the retail price in order to be left with the appropriate wholesale price at which competitors, reliant on the upstream (wholesale) input, can effectively replicate the retail offer of the downstream arm of the SP considered to have SMP.
- 8.176 A significant advantage of a retail minus price control is that it is comparatively easy to implement, as there is no need to develop a detailed cost model of the network required to supply the relevant wholesale LL products. Even setting the retail margin with reference to the SMP undertaking's retail costs requires significantly less cost data than constructing a network cost model. However, ComReg has already developed a cost model to set existing cost oriented market prices for LB TI WHQA LLs and this can be readily revised to reflect changes in costs and volumes since the last review.
- 8.177 Moreover a retail pricing policy based on the exclusion of specific retail costs from existing retail product prices could potentially give rise to an inflated estimation of the costs of wholesale inputs.
- 8.178 This issue could also exert an even greater bias in relation to PPC products which are not customer to customer solutions, but depend on Access Seekers leveraging their network investments to replicate a retail offering.
- 8.179 Furthermore, regulation was removed from retail LLs by ComReg in the 2008 Decision and Eircom can price them as it deems appropriate. As such there is no absolute price level from which to calculate a simple retail minus wholesale price.
- 8.180 Based on these considerations, ComReg is of the preliminary view that retail minus price controls are not an appropriate approach to set prices for LB TI LL products, services and facilities, including PPC prices.

⁵⁶⁴ TERA Consultants.

Option 4: Margin Squeeze Test

- 8.181 A margin squeeze can occur where a vertically integrated SP with SMP at the wholesale level sets wholesale prices such that - given the prevailing retail prices - it does not allow retail competition to cover its retail costs (e.g., sales, marketing, etc.). This will therefore be likely to foreclose entry to downstream markets.
- 8.182 Similarly, Eircom could set its downstream retail prices at a level such that a SEO may not recover the downstream retail costs that it incurs after acquiring the essential wholesale inputs from the SMP provider's wholesale business arm. This outcome would ultimately prevent the SEO from competing effectively in the retail market with the SMP provider. This again could foreclose existing competition and potential future entry.
- 8.183 In the medium to the long-term this would be to the detriment of competition and end-users.
- 8.184 A margin squeeze test ascertaining the price of the wholesale input that would allow the SEO to compete at the retail level can be set between retail and wholesale products and/or between different wholesale products.
- 8.185 A retail margin squeeze test compares the retail revenues with the retail and wholesale costs to see if the margin is positive or negative. If there is a negative margin the wholesale price and/or retail price may have to change.
- 8.186 Similarly, a margin squeeze test between retail and wholesale products ensures economic replicability at each layer of the value chain; with adequate economic space between each layer. A well-constructed margin squeeze test can ensure that a, deeply interconnected SP can reap the benefits of its network investments, providing an important competitive constraint on the SMP provider along the value chain, in both wholesale and retail markets.
- 8.187 A margin squeeze test can be used as a price control obligation to set maximum wholesale prices or as a complementary test in conjunction with other regulatory tools (e.g., cost orientation).
- 8.188 Currently, a margin squeeze test is applied to set a floor on end-to-end WLL prices based on the costs of PPC wholesale inputs and associated interconnect facilities costs, combined with the costs of a SEO with 25% market share, recovering costs for the use of its own infrastructural investments. These inputs are required to emulate an end-to-end, customer to customer LL product offering.

8.189 Presently, the majority of LB TI WHQA LL products, services and facilities supplied by Eircom are purchased by its own downstream business (but in low volumes with the number of circuit ceases far outnumbering new provisions in recent years). This fact - combined with the continuing decline in overall product service demands for LB TI LLs, in both retail and wholesale markets, - indicates that there unlikely to be a need to retain a margin squeeze test for this market over the duration of this review, including in circumstances where <[REDACTED]
[REDACTED]⁵⁶⁵.

Option 5: Cost Orientation

8.190 A cost orientation obligation means that the SMP operator has to ensure that its wholesale prices recover no more than its actual incurred costs adjusted for efficiency plus a reasonable rate of return

8.191 The setting of cost oriented maximum prices for LB TI WHQA LL products, services and facilities, including PPCs, is consistent with ComReg's statutory objectives under Section 12 of the Communications Regulation Act, 2002 and Regulation 16 of the Framework Regulations (as amended). It is envisaged that this should facilitate greater regulatory certainty and avoid the risk of excessive pricing as identified in Section 7.

8.192 A disadvantage of a cost orientation price control is that it requires the update/development of a cost model which can be resource intensive. However, as set out in paragraph 8.162 above, a BU-LRAIC+ cost model was developed by ComReg in its 2012 Pricing Decision, with this being used to determine the costs and maximum charges relating to PPCs, NGN Ethernet and current generation LL products. This can be updated to reflect the most up to date costs and volumes associated with LB TI WHQA LL products, services and facilities, including PPC EULs. Additionally, a separate BU-LRAIC+ cost model was used to establish cost oriented prices for Transport Links and is also available as a resource to refresh prices.

8.193 Hence, ComReg is of the preliminary view that a cost orientation obligation is justified to set maximum price levels for Low Bandwidth TI WHQA LL products, services and facilities, including PPC EULs and related Transport Links. This obligation is intended to minimise the risk of excessive pricing and preclude the risk of a vertically-integrated operator with SMP in the wholesale market from being able to exploit its position, by charging an excessive price for wholesale inputs, and so over recovering costs

Preliminary Conclusion on form of price control

8.194 For the reasons set out above, ComReg's preliminary view is that Eircom should be subject to an obligation of Cost Orientation with respect to products, services and facilities within the LB TI WHQA Market.

⁵⁶⁵ See paragraph 4.163 above.

Appropriate Costing Methodology

Overview

- 8.195 After deciding to that a Cost Orientation price control obligation is appropriate, the next issue to be addressed is to ascertain the correct costing methodology to be applied. The costing methodology determines the costs that should be included in any cost model and how this is converted into a unit price. In determining the appropriate costing methodology, the following issues need to be considered:
- (a) What costs should be included?
 - (b) How the costs should be appraised?
 - (c) What cost model(s) should be used to arrive at a unit cost?
- 8.196 When considering the options available to ComReg in determining the most appropriate costing methodologies, such as developing cost models to establish cost oriented tariffs, there is a need to ensure compliance with the price control obligations for products, services and associated facilities in the LB TI WHQA Market. There is also a need to balance a number of objectives, including the promotion of competition; incentivising infrastructure investment; ensuring appropriate cost recovery for Eircom; and ensuring the interests of end-users.
- 8.197 ComReg is of the preliminary view that effective competition in the downstream markets that rely on inputs from the LB TI WHQA Market, would be best served by applying price ceilings on wholesale inputs required to provide retail equivalents. In effect, cost orientated tariffs for the wholesale input PPCs should be established, and they in turn should be set as maximum wholesale price levels. This, in turn, avoids the risk of excessive price levels for such wholesale inputs.
- 8.198 In order to protect the interests of end-users, retaining cost orientated tariffs for PPC wholesale inputs creates the conditions to facilitate the development of effective downstream competition. Although both the retail LB TI Market and the LB TI WHQA Market are in slow decline⁵⁶⁶, other Access Seekers can purchase cost based wholesale inputs to compete in downstream markets. This, in turn, provides end-users with the opportunity to purchase services from a range of SPs with differentiated prices in the retail market.
- 8.199 The options to be considered in determining an appropriate costing methodology are the following;
- (a) What is the appropriate cost standard?
 - (b) Whether historic costs or current costs should be used?
 - (c) What is the appropriate Cost Model?

⁵⁶⁶ See Figure 6 and Figure 23 above.

- (d) Whether a Top Down (“**TD**”)⁵⁶⁷ model, bottom up (“**BU**”)⁵⁶⁸ model or hybrid model should be applied?

Appropriate Cost Standard

- 8.200 Cost standards refer to the method by which costs are allocated to services with the objective of allowing the operator to recover all the efficiently incurred costs associated with its network.
- 8.201 Certain assets and resources can be traced directly to a specific product/service and can, therefore, be considered as direct costs which are attributable to a specific product/service. However, other assets and resources that can be used by many different products/services require allocation rules to share such costs amongst the range of products/services that these assets and resources support. Costs can be generally categorised as follows:
- (a) **Common network costs:** costs that in general are not attributable to any product/service (e.g. costs incurred across the whole organisation regardless of product, so the costs cannot be directly attributed to a particular product or service. Examples include general finance function costs, CEO salary, regulatory licence fees, redundancy and voluntary severance costs);
 - (b) **Joint costs:** costs that are variable and incurred by some, but not all products/services, but cannot be directly attributed to one particular service (e.g. cable and trench costs for core network connectivity providing a highway for traffic for a range of services, such as broadband and LLs, but not attributable to local access services such as Local Loop Unbundling); and
 - (c) **Corporate overheads:** costs that cannot be allocated to products/services using a specific allocation method (e.g. the costs of the chief executive’s office would be allocated to all services).
- 8.202 The options for the choice of the appropriate cost standard for the purposes of a price control typically involve those listed below:
- (a) Average Variable Cost (“**AVC**”);
 - (a) Average Avoidable Cost (“**AAC**”);
 - (b) Long Run Average Incremental Cost (“**LRAIC**”);
 - (c) LRAIC plus; or
 - (d) Average Total Cost (“**ATC**”).
- 8.203 Each of the above cost standards is discussed below.

⁵⁶⁷ Top Down refers to the situation whereby the source of financial information being used is taken from the audited Eircom accounting records.

⁵⁶⁸ Bottom Up in general refers to a scenario whereby the costs are those incurred by an efficient operator when building an up to date and modern network.

Average Variable Cost

8.204 AVC approximates to the variable cost of producing an additional unit of output. However, it does not consider fixed costs, which can be a significant cost component faced by operators. ComReg, as a result, is of the preliminary view that the application of this cost standard, when used to establish wholesale product prices could prevent new market entrants and existing operators from recovering their investment costs. This, in turn, would significantly constrain the potential for entry by efficient entrants and could also lead to an exit of existing operators who cannot sustain a strategy that may, for example, involve long term losses.

Average Avoidable Cost

8.205 AAC are the short-run avoidable variable and incremental fixed costs of the additional sales of the product under review. The inclusion of fixed costs, distinguishes the AAC approach from the AVC approach. Furthermore, the exclusion of a mark-up for overall fixed and common retail costs, distinguishes AAC from ATC. As the AAC standard does not include provision for (non-avoidable) fixed costs and common costs in an *ex-ante* margin squeeze test, it could be argued that this provides the SMP operator with an advantage given the broad range of products and services over which it could conceivably recover such common costs. ComReg is of the opinion that the decision to enter the market depends on the expectation that fixed and common costs are going to be recovered; not only additional avoidable costs incurred by the SMP operator. Cost measures such as AAC do not ensure this, as the full total costs of an operator are not covered. Thus, ComReg is of the preliminary view, that to apply an AAC cost rule in an *ex ante* context would lead to sub-optimal entry conditions. This would be to the detriment of competition and, in turn, consumers. However, as noted above, ComReg does not envisage that there would be any significant new entry in the retail LB TI Market and/or the LB TI WHQA Market as both are in slow decline. Therefore, the main reason for excluding this option is the inability of SPs to recover fixed and common unavoidable costs.

LRAIC, LRAIC plus or ATC

8.206 The European Commission in its 'Guidance on the Commission's enforcement priorities in applying Article 82 of the EC Treaty [now Article 102 of the Treaty on the Functioning of the European Union (TFEU)] to abusive exclusionary conduct by dominant undertakings'⁵⁶⁹ noted that:

⁵⁶⁹ C (2009) 864 dated 9 February 2009 - at footnote 18.

“Long-run average incremental cost is the average of all the (variable and fixed) costs that a company incurs to produce a particular product. LRAIC and average total cost (ATC) are good proxies for each other, and are the same in the case of single product undertakings. If multi-product undertakings have economies of scope, LRAIC would be below ATC for each individual product, as true common costs are not taken into account in LRAIC. In the case of multiple products, any costs that could have been avoided by not producing a particular product or range are not considered to be common costs. In situations where common costs are significant, they may have to be taken into account when assessing the ability to foreclose equally efficient competitors.”

8.207 Given that one of the regulatory objectives is to reward investments already made (without allowing over recovery) and thereby continue to promote infrastructure competition the only three available options that ComReg believes are consistent with its objectives in this context are LRAIC, LRAIC plus and ATC. ComReg is of the view that the differences between LRAIC, LRAIC plus and ATC are as follows:

- (a) LRAIC is the average efficiently incurred variable and fixed costs that are directly attributable to the activity concerned over the long-run. This approach does not include an apportionment for common costs. LRAIC is a forward looking approach, but does not permit an operator to recover all of its efficiently incurred costs. Significant common costs which are not directly attributable to the product in scope would be excluded under this approach and could deter an operator from entering the market due to the inability to fully recover investment costs;
- (b) LRAIC plus is the average efficiently incurred variable and fixed costs that are directly attributable to the activity concerned over the long-run, plus a mark-up for joint and common costs. This approach avoids the risk of being unable to recover investment costs associated with joint and common costs;
- (c) ATC is the average total cost and includes variable, fixed, joint and common costs based on historical cost data but with no adjustments for efficiencies. This approach considers all relevant historic costs and so may encourage inefficient investments by operators.

ComReg’s preliminary view on the appropriate cost standard

8.208 Cost models are needed to assess the efficient cost levels for PPC products, services and facilities, including associated interconnection facilities which reflects a reasonable level of contribution to costs.

8.209 In order to establish an efficient level of costs so as to ascertain the cost oriented tariffs for PPCs, ComReg is of the preliminary view that cost models are the appropriate remedy to apply. The models used by ComReg as the appropriate models to determine the efficient level of PPCs (and any interconnect costs) are both based on the LRAIC plus cost standard. These models establish cost orientated maximum charges, relating to PPC EULS and PPC Transport Links, used for the interconnection of EULs.

Appropriate Cost Approach - Historic Costs or Current Costs

8.210 ComReg now considers whether Historic Costs or Current Costs should be used in setting cost-oriented prices.

Historic Costs

8.211 Under the historic cost approach, an operator will recover costs that were incurred at the time of the relevant transaction in the provision of products, services or associated facilities, along with a return on investment.

8.212 The historical cost accounts ('HCA') are based on the actual reported financial results of an operator for a particular expired period of time.

8.213 One of the main concerns with the HCA accounts is their lack of granularity and therefore, their suitability for modelling.

8.214 While HCA has the advantage in that there is no risk of an undertaking being overpaid, BEREC has suggested that the use of historic costs are not appropriate for decision making of the NRA as these may include inappropriate costs, inter alia, inefficient investments.⁵⁷⁰

8.215 ComReg is of the preliminary view that the use of historic costs to derive a wholesale charge would not send the correct signals to the market to encourage cost reductions nor would it provide other operators with a suitable benchmark for investment decisions.

Current Costs

8.216 The current cost approach values assets at the current market value and reflects changes in asset prices. The current cost approach is normally implemented based on the current cost accounting ('CCA') system of the incumbent or on the basis of a modern equivalent asset ('MEA') alternative approach. ComReg notes that Eircom no longer produces CCA accounts. An MEA approach reflects the costs that a hypothetical entrant would incur through investing in an alternative network. In the case of some components of network technology used for the delivery of legacy services such as TI LLs, modern equivalents no longer exist.

8.217 Manufacturers' supply chains have over time migrated to next generation technologies and no longer support legacy systems. In this context ComReg is of the view that a modified current cost approach should be adopted. This approach considers the cost trend for legacy infrastructure and extrapolates that forward from the last supply price provided by suppliers prior to market exit. Using the last available cost and the extrapolation based on noted cost trends, it is possible to determine equivalent market costs for comparable technology assets that would apply currently.

⁵⁷⁰ BEREC Report on Regulatory Accounting in Practice 2014, Doc. No. BoR(14) 114, published 29 September 2014, Page 64.

ComReg's preliminary view on the appropriate cost approach

8.218 For the reasons set out in the preceding paragraphs, ComReg is of the preliminary opinion that the modified current cost approach is the most relevant cost base to adopt to determine charges for LB TI WHQA products, services and facilities to continue to promote competition and appropriately reward investment by Eircom and Access Seekers.

Appropriate Cost Model

8.219 Given ComReg's preliminary opinion that LRAIC Plus based on a CCA approach is more appropriate where infrastructure investment is concerned, ComReg must then consider the type of model that is appropriate to adopt to determine the costs associated with the provision of LB TI WHQA LL services

8.220 ComReg has considered two options:

- (a) A top down ('**TD**') model; or
- (b) A bottom up ('**BU**') model

Top-Down Model

8.221 A top down model uses as a starting point the current financial information of the incumbent as an input. The information required can be obtained from the financial accounts (e.g. income statement, balance sheet etc.) or from budgeted accounts. This approach achieves exact cost recovery as it is linked to the actual investments made by an SMP operator.

8.222 The disadvantages of this approach, however, are as follows:

- (a) the accounting information may include inefficient costs incurred by an SMP operator;
- (b) it relies on significant amounts of detail from the SMP operator;
- (c) it relies heavily on the robustness of the data provided by the SMP operator; and
- (d) it cannot be converted into a forward-looking approach and may therefore provide the wrong "build/buy signal" to industry.

8.223 TD models can be constructed on a HCA or CCA basis. In a TD model based on HCA accounts, the net book value of assets are derived from the incumbent's fixed asset register (depreciated over their remaining useful life). In a TD model based on CCA accounts, the assets are revalued to their current costs, and discounted (via depreciation to date) to reflect the period of use since the initial investment. This results in a change in the depreciation and return on capital charges associated with a CCA approach rather than one based on HCA.

Bottom-Up Model

8.224 A BU model does not rely on historical financial data. Instead, it reflects the choices of a hypothetical, forward-looking efficient operator from both a technical and operational point of view.

8.225 Several approaches can be adopted. The most commonly used approaches are as follows:

- (a) **Scorched Earth:** This approach considers the theoretical situation of developing a new network, with the existing network functionality but with 100% efficiency. SP's networks develop incrementally over many years, dealing with immediate local demands in a region, often leveraging available assets to minimise immediate costs. So the networks evolve based on either a short or medium term perspective. This leads to inevitable inefficiencies in the network design and costs when considered in retrospect. A scorched node approach considers what and where demand exist today and allows for the design of an optimal network configuration, to meet existing demand for services at the actual locations where it exists. The costs of such a network would result in 100% efficiency. In effect it would benefit from hindsight.
- (b) **Scorched Node:** In the scorched node approach, the existing nodes are said to be fixed whereas all other network elements can be optimised. An optimised network is then built within the constraints of the existing nodes.

8.226 A scorched node approach is often considered to be the preferred approach as it allows for the modelling of efficient costs and scale while maintaining the costs and technology assumptions faced by the SMP operator.

ComReg's preliminary view on the appropriate cost model

8.227 ComReg is of the preliminary view that a scorched node BU approach should be used in developing the model. BU models are easier to develop and maintain and they are better suited than a TD models to provide appropriate "Build/Buy signal" to the market since they are more reflective of the conditions faced by an Access Seekers wishing to provide service to the retail market.

Cost Modelling

8.228 In the paragraphs above ComReg set out the options available to ComReg in order to determine the appropriate costing methodology to assess the level of costs relevant to PPC products. ComReg also identified the cost model used to determine the appropriate level of costs associated with PPCs. ComReg also set out the proposed inputs and assumptions used in the underlying model.

8.229 In the 2012 Pricing Decision⁵⁷¹ ComReg outlined the approach used to develop a BU LRAIC+ cost model for 'legacy' LL products, including PPCs.

⁵⁷¹ See Sections 4.1 and 4.2 of 2012 Pricing Decision.

- 8.230 This model is now been revised in light of current network service demand for both legacy and Next Generation Network ('**NGN**') Ethernet LLs, using equivalent bandwidth demands, plus demands from voice services and broadband traffic. This modelling approach was adopted in favour of the alternative option of using a model based on an NGN Ethernet technology only. This is because if that alternate was used, then legacy LL tariffs based on the costs of a next generation network would distort the migration incentives towards NGN Ethernet services. In effect, the network cost model is designed based on legacy SDH network technology, catering for the demands of both legacy and next generation services.
- 8.231 As stated above, it is ComReg's preliminary view that a model based on bottom-up ("BU") long run average incremental cost ("LRAIC") plus (referred to hence forth as "BU-LRAIC plus") costs, is the appropriate model to determine the efficient level of product costs. This model will establish the cost orientated maximum charges relating to PPC EULs falling within the bandwidth range in scope. In turn, the model will identify the PPC products that require price adjustment.
- 8.232 Additionally, ComReg is again reviewing the BU-LRAIC plus cost model used to determine cost oriented prices for Transport Link interconnection circuits required for PPC products. This cost model was originally developed by Eircom, and subsequently reviewed and updated by ComReg and its consultants.
- 8.233 The remainder of this Section on cost modelling is discussed under the following headings:
- (a) Background to updating the BU-LRAIC plus Cost Model;
 - (b) Modelling Approach; and
 - (c) Pricing Approach.

Background to updating the BU-LRAIC + Model

- 8.234 In December 2015, ComReg issued an Information request to Eircom, pursuant to Section 13(d)(1) of the Communications Regulation Act 2002 (as amended), to seek updated information regarding capacity demands on its core network infrastructure from traffic associated with voice, broadband and LL services. Eircom has made a number of submissions to ComReg in response to this information request and this information has been reflected in the revised BU-LRAIC+ cost model.

Modelling Approach

- 8.235 ComReg is of the preliminary view that a model based on BU-LRAIC plus costs, is the appropriate model to determine the efficient level of product costs. This is the case for both PPC EULs within the LB TI WHQA Market and related Transport Link products.

- 8.236 Summary service demand is based on data recently provided to ComReg, and outlined above. This data indicated the levels of service demands for LB TI WHQA LLs (including WLL and PPC EULs) by exchange or node location and by bandwidth in the period 2014-2015. Additionally the model used to derive PPC prices is now amended to reflect more current, revised costs, in order to determine an efficient cost base for such infrastructure. Additionally, a separate BU-LRAIC plus cost model used to determine cost oriented prices for Transport Links had its costs updated to reflect current market values.
- 8.237 The primary model, dealing with legacy LL demand, is designed to reflect the costs of providing both TI based PPCs and WLLs on a pure legacy core network cost model basis.
- 8.238 It is important to note that ComReg has proposed that Eircom should no longer be required to provide WLLs given that demand for such services can be and has been converted into service demands for two PPC EULs which, in conjunction with Transport Links, are required to replicate an end to end WLL product.⁵⁷²
- 8.239 In considering the allocation of network costs ComReg considers the treatment of switching costs, transmission costs, operational costs and capital costs.

Switching Costs

- 8.240 The switching costs of the legacy core network are calculated based on total costs of the node (often referred to as the Open Eircom Martis network), the traffic solely for LLs and the associated routing factors.

Transmission Costs

- 8.241 The transmission costs are shared between different services which use the transmission layer, i.e. voice, broadband and LLs.
- 8.242 The busy-hour demand, which is used to dimension the network, is calculated for each service. The capacity in terms of STM-1 at the different levels of the network is determined in the model for voice, broadband and LL separately. In other words, dedicated circuits of fixed capacity are modelled across the legacy transmission SDH network for individual services. The cost of the SDH transmission network is then allocated to the different services (voice, broadband, LLs) based on the busy hour traffic of each service at different levels of the network based on capacity allocation rules.

⁵⁷² 2 PPC EULs are typically required to replicate an end-to-end retail LL.

Operating Costs

8.243 The original cost model used to establish cost oriented tariffs for PPCs in the context of the 2012 Pricing Decision, was populated with values for operating costs, as provided by Eircom, but only after ComReg directed a significant efficiency adjustment to reduce those costs. This adjustment was applied in order to reflect future expected reductions in costs for TI LLs. The revised model currently being used to determine cost oriented prices for PPCs, retains the operating costs used in the original model (inclusive of the efficiency adjustment). This was considered reasonable as a review of the actual trend of operating costs movements for TI LL products, recorded in Eircom's audited regulatory accounts, between 2011 and 2015, indicates that there is no need for further reductions in the operating costs for use in the revised cost model. Separately, an ongoing review of the cost model used to determine the price level of Transport Links will incorporate an analysis of the operating costs contained in Eircom's regulatory accounts for the period 2011 to 2015.

Capital Costs

8.244 The capital cost components of the original model, are based on input costs originally provided by Eircom, when designing the model used to address cost orientation under the 2012 Pricing Decision. Similarly, the capital costs in the BU-LRAIC plus cost model used to determine Transport Link tariffs were updated by Eircom at that time.

8.245 Both models determined annualised costs for infrastructural capital components based on the application of a tilted annuity equation. Central to the application of such a calculation is the requirement to provide details on the expected price trend for such components. Eircom provided such data for the original model, and this has permitted the derivation of current capital costs for infrastructural investments detailed in each of the revised cost models.

8.246 Capital charge calculations have also been updated in the model to reflect the revised WACC (Weighted Average Cost of Capital) of 8.18%, set out by ComReg in the 2014 WACC Decision)⁵⁷³.

8.247 As noted above, recent service level demand provided by Eircom from voice, broadband and LLs has permitted the derivation of the share of efficient model costs (based on the FL-LRAIC plus⁵⁷⁴ approach), associated with the existing population of PPCs and WLL products within the bandwidth range from 64Kb/s up to and including 2Mb/s.

⁵⁷³ ComReg Document 14/136 Decision D15/14: Cost of Capital ('**2014 WACC Decision**').

⁵⁷⁴ Forward Looking Long Run Average Incremental cost with common or joint costs taken into account in the cost allocation process.

Overall preliminary conclusion on cost modelling

8.248 ComReg's preliminary view is that BU-LRAIC+ cost models should be the basis for establishing the maximum market prices for PPC and Transport Link products, but that the modelling approach should focus on the use of SDH network technology. This approach is adopted in order to maintain the incentive for service migration to move to MI LL products in the future.

Pricing Approach

Proposed pricing approach for PPCs, PPC equivalents and related Transport Links

- 8.249 The existing schedules of tariffs for PPC products and equivalents for WLL products (within the 64Kb/s and 2Mb/s bandwidth range) are listed in Eircom's LLRO⁵⁷⁵.
- 8.250 Applying the volume and mix of the LB TI LLs in conjunction with the relevant schedule of tariffs, it is possible to determine the wholesale revenues which can be realised from PPCs.
- 8.251 When the total resulting revenues are compared to the costs determined in the model, it is possible to assess if existing tariffs result in an over or under-recovery of costs.⁵⁷⁶ This forms the basis of the preliminary decision of ComReg to introduce a price ceiling or maximum price level for PPCs which will ensure that Eircom's charges are set in line with its proposed cost orientation obligation.
- 8.252 As such, ComReg is of the view that the PPC tariffs should be reviewed in further detail. In particular, both the Main Link Access ('**MLA**') and the Main Link Distance ('**MLD**') cost components of PPCs. MLA tariffs which relate to the network port costs of connecting a LL service from the customer cable into the service ports at the SP's serving network node. The MLD tariffs relate to costs incurred in providing LL connectivity from the node directly serving the customers cable, across the core network cloud to reach a distant network node. The distant network node is where the service is interconnected via a Transport Link to the alternate network provider who is dependent on a PPC to replicate a retail offering. A key measure of costs or tariffs for the MLD is the main link distance, (this is the distance between the two Eircom network nodes, if relevant). The MLD charge does not apply where the end customer's premises and the SP's Transport Link are connected to the same exchange.

⁵⁷⁵ http://www.openeir.ie/Products/Data/Leased_Lines/

⁵⁷⁶ Note that the cost base of the model is designed to cater for the demands of both TI leased lines and NGN equivalents.

- 8.253 The remaining cost component contributing to PPC tariffs is the Local End tariff, which connect the end-user site to the adjacent Eircom network node. This component covers the costs of a customer premises modem, and the cable and trench costs incurred to connect the end-user to the nearest Eircom network node. The tariff varies based on the distance between the end-user and the serving Eircom network node location and on the bandwidth delivered. All services in scope are of low bandwidth, requiring only a copper cable medium for connectivity. In reviewing the cost of the PPC local loop ComReg has taken account of:
- (a) The WACC imposed under the 2014 WACC Decision; and
 - (b) The contributory cost of the copper line(s) (as per the Copper Access Model⁵⁷⁷). This used a BU LRAIC plus valuation, with the exception of civil engineering assets which can be reused for NGA along with the distribution of copper LLs per exchange provided previously by Eircom, to calculate an average cost of copper loops for LL.
- 8.254 Transport Links prices are based on an existing BU LRAIC plus cost model and following a review of both the operating and capital costs in that model, revised cost oriented tariffs were derived. Consequently, existing tariffs will be reviewed.
- 8.255 With respect to connection charges for PPCs, ComReg also proposes that these charges should be cost oriented, namely based on the likely actual costs incurred by Eircom, adjusted for efficiencies, plus a regulated rate of return (based on the WACC). The adjustment for efficiencies is to ensure that Eircom is unable to recover inefficiently incurred costs.

Duration of Price Control

- 8.256 While the cost model includes cost and forecast demand estimates up to and including the year 2020, ComReg is of the preliminary view that in line with the market analysis process, the price control period should be set for three years.
- 8.257 It is proposed however, that ComReg will carry out an internal yearly review of the main aggregated model inputs, such as costs and volumes to assess if any material or exceptional changes associated with model inputs are required to re-assess the risk of cost over-recovery, which may require a further review of wholesale price levels of key wholesale inputs.

⁵⁷⁷ Pricing of Eircom's Wholesale Fixed Access Services; Response to Consultation Document 15/67 and Final Decision, Doc. No.16/39, Decision No. D03/16, published 18 May 2016.

Accounting Separation and Cost Accounting Remedies

Overview

- 8.258 In Section 7 ComReg identified that Eircom has the ability and incentive to potentially engage in a range of anti-competitive pricing behaviours to the ultimate detriment to competition and consumers. These included the risk that Eircom could charge excessive prices for LB TI WHQA products, services and facilities, or that Eircom might impose a margin squeeze in order to leverage its SMP position from the LB TI WHQA Market into adjacent or downstream markets. In view of this, ComReg considers that the imposition of obligations of accounting separation and cost accounting on Eircom is justified.
- 8.259 In Section 7, ComReg has identified that Eircom has the ability and incentive to potentially engage in anti-competitive pricing behaviours to the ultimate detriment to competition and consumers. These included the risk that Eircom could charge excessive prices for Low Bandwidth TI WHQA LLs. Therefore, ComReg considers the imposition of the price control obligation of cost orientation on Eircom with respect to these products is justified and proportionate
- 8.260 In general, if specific price control obligations, via cost orientation, are to be meaningful, it may be necessary to have a clear and comprehensive understanding of the costs associated with an SMP operator's provision of those products. Obligations to maintain appropriate cost accounting systems generally support obligations of price control (and accounting separation), and can assist ComReg in monitoring the obligation of non-discrimination.
- 8.261 Having regard to the need to support the effectiveness of the proposed price control obligations set out above, ComReg considers that the continued imposition of accounting separation and cost accounting obligations upon Eircom in the LB TI WHQA Market is required. In this respect, Eircom shall ensure that it maintains appropriate costs accounting systems to justify its prices/costs or to permit a review of the appropriate level of costs which should be considered in future reviews of the cost model used to determine cost orientated prices. ComReg is also proposing to maintain cost accounting and accounting separation obligations on Eircom with respect to the MI WHQA Market, but only for MI LL interconnection products (i.e. Wholesale Ethernet Interconnect Links). This later requirement recognises the use of such facilities for the interconnection of broadband traffic between Eircom and OAOs, and the ongoing need to monitor their profitability, as part of a regulated market. The detailed nature of these accounting separation and cost accounting obligations are those currently imposed upon Eircom and as specified in the 2010 Accounting Separation Decision.⁵⁷⁸

⁵⁷⁸ Accounting Separation and the Cost Accounting Review of Eircom Limited, ComReg Document 10/67, Decision D08/10, August 2010.

- 8.262 The burden of proof rests in law with Eircom to show that its prices/charges for LB TI WHQA LL and related interconnection facilities, are derived from costs, having regard to the nature of the proposed price control obligations. Furthermore, for the purpose of calculating the costs of efficient provision of such PPC services, in accordance with Regulation 13(4) of the Access Regulations, ComReg notes that it may also use cost accounting methods independent of those used by any SP in the market. Additionally, ComReg can also issue direction requiring an operator to provide full justification for its prices, and may, where appropriate, require prices to be adjusted.
- 8.263 In this context ComReg's preliminary view is that the proposed cost accounting and accounting separation obligations, are proportionate and justified.

Summary of Preliminary Conclusions on Price Control and Cost Accounting

- 8.264 Having regard to the analysis set out in paragraphs 8.150 to 8.263 above, ComReg's preliminary view is that proposed pricing remedies and accounting obligations are proportionate and justified.
- 8.265 ComReg's preliminary view is to continue the imposition of a cost orientation and cost accounting and accounting separation obligations on Eircom with respect to LB TI WHQA LLs.
- (a) The obligation of cost orientation will continue to apply to LB TI WHQA LL PPC products (including interconnect facilities known as Transport Links);
 - (b) Cost orientation is to be based on BU-LRAIC+ cost modelling approach, based on current cost accounting, but in the case of PPCs and Transport Links, based on the costs of an SDH network.
 - (c) Existing cost accounting and accounting separation obligations continue to apply.

Overall Preliminary Conclusions on Remedies in the Low Bandwidth TI WHQA Market

- 8.266 Having regard to the competition problems identified in Section 7 and the discussion in paragraphs 8.35 to 8.265 above, ComReg proposes to impose a range of access, non-discrimination, transparency and price control, cost accounting and accounting separation remedies on Eircom, with such obligations being imposed in the LB TI WHQA Market.

Question 6: Do you agree with ComReg’s approach to imposing access, non-discrimination, transparency, price control and cost accounting and accounting separation remedies? Are there other approaches that would address the identified competition problems? Please explain the reasons for your answer, clearly indicating the relevant paragraph numbers to which your comments refer, along with all relevant factual evidence supporting your views.

8.267 ComReg has set out these remedies in the form of a Draft Decision Instrument which is attached at Appendix: 8 of this Consultation and respondents are invited to comment on this Decision Instrument.

Question 7: Do you agree with ComReg’s draft Decision Instrument set out in Appendix: 8, in particular, that its wording accurately captures the intentions expressed in this Section 8? Do respondents agree with ComReg’s Definitions and Interpretations as set out in Part I of the Draft Decision Instrument? Please explain the reasons for your answer, clearly indicating the relevant paragraph numbers in the Draft Decision Instrument to which your comments refer.

8.268 Respondent’s should note that comments on the remedies themselves should be addressed in their responses to Question 6, while comments on the Decision Instrument in response to Question 7 should principally to relate to whether it accurately captures, from the perspective of being sufficiently clear in its wording, the proposed remedies.

8.269 If, having considered respondents’ views on the proposed remedies set out in this section, ComReg proposes to amend or clarify its position, this may lead to parallel updates to the Draft Decision Instrument.

9. Withdrawal of obligations in the High Bandwidth TI WHQA Market and MI WHQA Market

- 9.1 In Section 5 of this Consultation, ComReg set out its preliminary view that there is a separate HB TI WHQA Market for wholesale TI LLs with speeds in excess of 2Mb/s, in addition to a MI WHQA Market. In Section 6 of this Consultation, ComReg's preliminary view is that there is insufficient evidence to warrant a designation of SMP on any SP in either of these markets.
- 9.2 ComReg has found the both of these markets to be competitive and therefore, proposes to remove all existing obligations from them.
- 9.3 In order to avoid unnecessary disruption to the MI and HB TI WHQA Markets and by implication, to end-users, ComReg is proposing that the access (insofar as they relate to services already in place) and cost-orientation obligations shall remain in place until the expiration of a "sunset" period of between 6-9 months.
- 9.4 ComReg is proposing this for a number of reasons as set out below. However, it should be noted that during this sunset period Eircom would not be obliged to provide any **new** orders for MI and HB TI WHQA LLs to Access Seekers (although it is free to do so on a commercial basis). It would be required to maintain existing access at existing prices⁵⁷⁹ during the sunset period. Eircom would not, however, be required to meet other obligations (for example, in relation to transparency, non-discrimination, margin squeeze etc.).
- 9.5 In considering the duration of the sunset period, Access Seekers should be afforded a reasonable time period during which to negotiate commercial arrangements with Eircom, to secure alternate suppliers, or in which to connect customer premises using their own infrastructure. ComReg considers that it would not be in the interest of industry or end-users for LLs to be disconnected within a short notice period.
- 9.6 Should ComReg decide to remove regulation from the MI WHQA Market and the High Bandwidth TI WHQA Market, as noted above, ComReg considers that the continued imposition of other obligations such as a margin squeeze test post publication of any such decision would not be reasonable or proportionate. To maintain such obligations during any sunset period would be excessive and unreasonable in circumstances where ComReg finds (assuming it does) that no SP has SMP.

⁵⁷⁹ Both Eircom and Access Seekers would be subject to contractual terms and conditions already in place.

- 9.7 It is important to note that Eircom will be required to maintain its WEIL (Wholesale Ethernet Interconnection Links) product at cost orientated prices by virtue that this service is an essential component of regulated products in other markets: The WEIL service was mandated by ComReg in its 2013 “NGA Decision, D03/13⁵⁸⁰”.
- 9.8 Finally, if ComReg’s eventually concludes that it is appropriate to remove regulation in the HB TI WHQA Market and the MI WHQA Market existing related requirements to publish KPIs under the 2011 KPI Decision would also be removed⁵⁸¹.

⁵⁸⁰ Next Generation Access, Remedies for Next Generation Access Markets, ComReg Doc. No. 13/11, published 31 January 2013.

⁵⁸¹ For example, metrics 45 and 48 on page 65 of the 2011 KPI Decision; metrics 49, 50, 51 and 52 on page 65 of the 2011 KPI Decision and metrics 55, 56, 57 and 59 on page 66 of the 2011 KPI Decision.

10. Regulatory Impact Assessment

Introduction

- 10.1 The Regulatory Impact Assessment ('**RIA**') is an analysis of the likely effect of proposed new regulation or regulatory change. The purpose of a RIA is to establish whether regulation is actually necessary, to identify any possible negative effects which might result from imposing a regulatory obligation and to consider any alternatives. The RIA should help identify regulatory options, and should establish whether proposed regulation is likely to have the desired impact. It is a structured approach to the development of policy, and analyses the impact of regulatory options on different stakeholders. Appropriate use of the RIA should ensure that the most effective approach to regulation is adopted.
- 10.2 ComReg's approach to RIA follows the RIA Guidelines⁵⁸² published by ComReg in August 2007 and takes into account the "Better Regulation" programme⁵⁸³ and international best practice (for example, considering developments involving RIA published by the European Commission and the OECD).
- 10.3 Section 13(1) of the Communications Regulation Acts 2002 (as amended) requires ComReg to comply with Ministerial Policy Directions. In this regard, Ministerial Policy Direction 6 of February 2003⁵⁸⁴ requires that, before deciding to impose regulatory obligations on undertakings, ComReg shall conduct a RIA in accordance with European and international best practice and otherwise in accordance with measures that may be adopted under the "Better Regulation" programme.
- 10.4 In conducting the RIA, ComReg has regard to the RIA Guidelines, while recognising that regulation by way of issuing decisions, e.g. imposing obligations or specifying requirements in addition to promulgating secondary legislation, may be different to regulation exclusively by way of enacting primary or secondary legislation. Our ultimate aim in conducting a RIA is to ensure that all measures are appropriate, proportionate and justified. To ensure that a RIA is proportionate and does not become overly burdensome, a common sense approach will be taken. As decisions are likely to vary in terms of their impact, if after initial investigation, a decision appears to have relatively low impact ComReg may carry out a lighter RIA in respect of those decisions.

⁵⁸² [ComReg Document 07/56a](#), ComReg, "Guidelines on ComReg's Approach to Regulatory Impact Assessment", 10 August 2007 (the '**RIA Guidelines**').

⁵⁸³ Department of the Taoiseach, "Regulating Better", January 2004. See also "Revised RIA Guidelines: How to conduct a Regulatory Impact Analysis", June 2009, (**The Department of An Taoiseach's Revised RIA Guidelines**), available from: http://www.taoiseach.gov.ie/eng/Publications/Publications_Archive/Publications_2011/Revised_RIA_Guidelines_June_2009.pdf.

⁵⁸⁴ Ministerial Policy Direction made by the Minister of Communications, Marine and Natural Resources on 21 February 2003.

10.5 ComReg's approach to RIA follows five steps:

Step 1: Describe the policy issue and identify the objectives.

Step 2: Identify and describe the regulatory options.

Step 3: Determine the impacts on stakeholders.

Step 4: Determine the impacts on competition.

Step 5: Assess the impacts and choose the best option.

10.6 The purpose of carrying out a RIA is to aid decision-making through identifying regulatory options and analysing the impact of those options in a structured manner. The Department of An Taoiseach's Revised RIA Guidelines state that

*"RIA should be conducted at an early stage and before a decision to regulate has been taken"*⁵⁸⁵.

10.7 The European Commission, in reviewing its own use of impact assessments, also notes that:

*"Impact assessments need to be conducted earlier in the policy development process so that alternative courses of action can be thoroughly examined before a proposal is tabled"*⁵⁸⁶.

10.8 In determining the impacts of the various regulatory options, current best practice appears to recognise that full cost-benefit analysis would only arise where it would be proportionate or in exceptional cases where robust, detailed and independently verifiable data is available. Such comprehensive review may be undertaken by ComReg when necessary and appropriate.

10.9 Having regard to the various sets of guidelines, it is clear that the RIA should be introduced as early as possible in the assessment of potential regulatory options, where appropriate and feasible. The consideration of regulatory impact provides a discussion of options, and the RIA should therefore be integrated within the overall preliminary analysis. This is the approach which ComReg is following in this market review. The RIA will be finalised in the final decision document, having taken into account all the responses to this Consultation and any comments from the CCPC and the European Commission.

⁵⁸⁵ See paragraph 2.1 of the Department of An Taoiseach's Revised RIA Guidelines.

⁵⁸⁶ Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, "Second strategic review of Better Regulation in the European Union", COM(2008) 32 final 30.01.2008, p. 6.

10.10 ComReg now conducts its RIA having regard to its proposed approach to impose (or not) regulatory remedies identified in this Consultation, along with a consideration of other options. The following sections, in conjunction with the rest of the analysis and discussion set out elsewhere in this Consultation, represent a RIA. It sets out a preliminary assessment of the potential impact of the proposed approach to the imposition of regulatory obligations on Eircom in the LB TI WHQA Market, and the proposed removal of regulatory obligations in the MI WHQA Market and HB TI WHQA Market.

Principles in Selecting Remedies

10.11 In paragraphs 8.8 to 8.12 ComReg set out the legislative basis upon which it must consider the imposition of remedies. In choosing remedies ComReg is obliged, pursuant to Regulation 8(6) of the Access Regulations, to ensure that they are:

- Based on the nature of the problem identified;
- Proportionate and justified in the light of the objectives laid down in Section 12 of the Communications Regulation Acts 2002 (as amended), and Regulation 16 of the Framework Regulations; and
- Only imposed following consultation in accordance with Regulations 12 and 13 of the Framework Regulations.

10.12 Section 12(1)(a) of the Communications Regulation Acts 2002 (as amended) sets out the objectives of ComReg in exercising its functions in relation to the provision of electronic communications networks, electronic communications services and associated facilities, namely:

- To promote competition;
- To contribute to the development of the internal market; and
- To promote the interests of users within the European Union.

Describe the Policy Issue and Identify the Objectives

10.13 In general, the European Commission acknowledges that once SMP is identified in markets which are defined as susceptible to *ex ante* regulation, then the regulatory framework foresees that at least one regulatory obligation would be imposed to mitigate against the exercise of SMP and to ensure the development of effective competition within and across communications markets. We have noted previously⁵⁸⁷ that the European Commission has established that the WHQA Market is susceptible to *ex ante* regulation and on this basis ComReg has carried out the preceding analysis in this Consultation.

⁵⁸⁷ See paragraph 1.27.

- 10.14 Having regard to the competition problems identified in Section 7, ComReg's objectives are to enhance the development of effective competition in relevant downstream markets and to help ensure that consumers can reap maximum benefits in terms of price, choice and quality of service. In so doing, ComReg is seeking to prevent exploitative behaviour and/or restrictions or distortions in competition amongst SPs. ComReg is also seeking to provide regulatory certainty to all SPs through the development of an effective and efficient forward-looking regulatory regime that serves to promote competition.
- 10.15 In pursuing these objectives, ComReg has considered the impact of specific forms of regulation in the LB TI WHQA Market. As a result, ComReg is of the preliminary view that the remedies specified in Section 8 are both appropriate and justified in light of the market analysis and the identified competition problems. The regulatory options are further considered below.

Identify and Describe the Potential Regulatory Options

- 10.16 ComReg recognises that regulatory measures should be kept to the minimum necessary to address the identified market failure in an effective, efficient and proportionate manner. There are a range of potential regulatory options available to ComReg to address the potential competition problems in the LB TI WHQA Market.
- 10.17 In this regard, regulation can be considered to be incremental, such that only obligations are imposed which are necessary and proportionate to the competition problems which have been identified. The lightest measure that can be imposed is the obligation of transparency⁵⁸⁸. Should this be insufficient to address competition problems on its own, ComReg may apply a non-discrimination obligation⁵⁸⁹. If this is still not sufficient, ComReg may next consider the imposition of an access obligation⁵⁹⁰, or accounting separation obligations⁵⁹¹. The final measure to be considered is the imposition of a price control and cost accounting remedy⁵⁹².
- 10.18 Given ComReg has identified in Section 6 that no undertaking is likely to have SMP in the MI WHQA Market and HB WHQA Market, ComReg cannot, as a matter of law impose any regulatory obligations in these markets. However, as noted in Section 9, ComReg has proposed a sunset period of 6 to 9 months for the withdrawal of existing remedies imposed upon Eircom in these markets (subject to the requirements specified).

⁵⁸⁸ Regulation 9 of the Access Regulations.

⁵⁸⁹ Regulation 10 of the Access Regulations.

⁵⁹⁰ Regulation 12 of the Access Regulations.

⁵⁹¹ Regulation 11 of the Access Regulations.

⁵⁹² Regulation 13 of the Access Regulations.

LB TI WHQA Market

10.19 In Section 5 and 6 of this Consultation, ComReg set out its preliminary view on the definition of LB TI WHQA Market, followed by an assessment of competition within this market. ComReg consequently proposes to designate Eircom with SMP in the LB WHQA Market, as set out in Section 6⁵⁹³. In Section 7, ComReg considered, on the basis of a preliminary SMP finding, the potential for competition problems to arise in the LB TI WHQA Market over the review period in question. As noted in paragraph 8.8, in order to address the identified competition problems in the LB TI WHQA Market, ComReg is required to impose on Eircom one or more (as appropriate) of the obligations (or remedies) set out below:

- (a) Access;
- (b) Transparency;
- (c) Non-Discrimination;
- (d) Price Control and Cost Accounting; and
- (e) Accounting Separation.

10.20 First, ComReg must consider the question of regulatory forbearance, and then incremental imposition of one or more of the obligations outlined above.

Forbearance

10.21 In the case of the current analysis of the LB TI WHQA Market, ComReg is required⁵⁹⁴ to impose at least some level of regulation on Eircom, having been designated as having SMP. Regulation 8(1) of the Access Regulations and Regulation 27(4) of the Framework Regulations requires ComReg to impose at least some level of regulation on undertakings ultimately designated as having SMP. In Section 6, ComReg set out its preliminary view that Eircom has SMP in the LB TI WHQA Market. In Section 7, ComReg identified a range of competition problems that could occur in the LB TI WHQA Market, absent regulation.

⁵⁹³ See paragraphs 6.95 to 6.98.

⁵⁹⁴ Per Regulation 8(1) of the Access Regulations.

10.22 In Section 7, ComReg set out its view that, absent regulation, there is the potential and incentive for Eircom to engage in exploitative and/or exclusionary behaviour in the LB TI WHQA Market. In view of this, absent the imposition of any remedies within the LB TI WHQA Market, it is ComReg's view that the market would not likely function effectively. For example, access could be effectively refused or materially delayed (resulting in certain consumers not being able to use retail TDM LLs (or other) services or having to incur the additional costs in accessing such services). In addition, the price for LB TI WHQA LLs may be set above the level that would pertain in a competitive outcome and/or Eircom may be in a position to distort competition in other markets (such as for MI retail LLs⁵⁹⁵). As highlighted in Section 8⁵⁹⁶, it is ComReg's preliminary view that the option of regulatory forbearance in the LB TI WHQA Market is not, therefore, appropriate or justified. By not imposing any regulatory obligations on Eircom, ComReg would be acting contrary to its own regulatory obligations. Per Regulation 8(1) of the Access Regulations and Regulation 27(4) of the Framework Regulations, once SMP has been identified ComReg is obliged to impose at least one regulatory remedy.

Transparency Obligations

10.23 As noted in paragraphs 8.19 to 8.21, Eircom has previously been designated with SMP under the 2008 Decision and is currently subject to transparency obligations in that market.

10.24 ComReg's preliminary view in Section 8 is that Eircom should be required to comply with transparency obligations in order to minimise information asymmetries and, therefore, facilitate effective access to LB TI WHQA and promote effective competition in downstream markets. In Section 7 ComReg identified competition problems which, absent regulation, could potentially arise in the LB TI WHQA Market (and related markets). The competition problems identified included inter alia potentially excessive and/or discriminatory pricing, as well as a potential for outright or constructive (e.g. through protracted negotiations on terms and conditions) refusal to supply with a view to extracting prices above efficient cost and/or distorting competition in related markets. In this regard, ComReg is proposing that, as part of a general transparency obligation pursuant to Regulation 9 of the Access Regulations, Eircom shall be required to publish a LLRO setting out the contractual terms and conditions and technical basis upon which Service Providers can obtain access to LB TI WHQA. It is further proposed to publish wholesale prices and to provide advance notice of price/product changes to ComReg and to other SPs.

⁵⁹⁵ For example, a purchaser of MI retail LLs may also require LB TI Retail LLs and a SP may not be in a position to service all the purchaser's needs, absent having access to LB TI WHQA

⁵⁹⁶ See paragraphs 8.27 to 8.32.

- 10.25 ComReg recognises that the LLRO and other transparency obligations may require some slightly increased level of implementation. However, as the LLRO is effectively the standard offer of contract for LB TI WHQA services and associated facilitates which Eircom has already published, ComReg is of the preliminary view that the incremental level of implementation associated with publishing such standard contracts and in meeting the other transparency obligations should be relatively contained.
- 10.26 ComReg has considered whether transparency obligations alone would be sufficient to address the competition problems identified in Section 7 and does not consider this to be the case. For example, problems inter alia associated with excessive pricing, discriminatory behaviour (on price or non-price grounds) and/or impeded or delayed access would not be capable of being adequately addressed through transparency obligations alone.

Non-Discrimination Obligations

- 10.27 The principle of non-discrimination is designed to ensure that undertakings with market power do not distort competition, in particular, where they are vertically-integrated undertakings that supply services to undertakings with whom they compete on downstream markets. As discussed in Section 7 a potential competition problem arises when an integrated operator has SMP in one market which has links with other adjacent markets either at a similar (horizontal) or different (vertical) level in the production or distribution chain. In such circumstances the SMP operator may attempt to transfer (leverage) its market power to such horizontally or vertically related markets. This could enable the SMP operator to strengthen its position in those related markets and potentially also reinforce its existing market power in the SMP market in question.
- 10.28 As noted in Section 8⁵⁹⁷, Eircom currently has an obligation of non-discrimination with respect to the provision of LB TI WHQA and additional associated facilities.
- 10.29 In Section 7 ComReg identified that Eircom has the ability and incentive to engage in such behaviour which can impact upon downstream competition and consumers. For example, Eircom could offer different access products or service quality to different buyers. Equally so, Eircom could treat Access Seekers differently to its own retail subscribers. As a consequence, ComReg proposes to require that Eircom is subject to non-discrimination obligations, including in respect of LB TI WHQA prices or other charges and ensure that access and information are provided to all other undertakings under the same conditions as Eircom provides to itself or to its downstream retail arm.

⁵⁹⁷ See paragraph 8.18.

10.30 ComReg has considered whether non-discrimination obligations alone would be sufficient to address the competition problems identified in Section 7 and does not consider this to be the case. For example, excessive/discriminatory pricing, outright or constructive denial of access problems, delaying tactics or poor service quality issues could *inter alia* still remain in the presence of a transparency obligation. Therefore, the imposition of non-discrimination obligations is both proportionate and justified having regard to the competition problems identified.

Access Obligations

10.31 An access obligation gives SPs the right to request access to TI LB WHQA products and associated facilities and establishes the principles on which the relevant products and services should be made available. As noted in Section 8⁵⁹⁸, Eircom has a range of access obligations currently imposed upon it by virtue of its existing designation with SMP in the 2008 Decision. These include obligations to negotiate in good faith with undertakings requesting access; not withdraw access to facilities already granted and continue to provide such facilities in accordance with existing terms and conditions and specifications; and meet reasonable requests for access to specified network elements, facilities or both such elements and facilities.

10.32 ComReg's preliminary view is that such obligations to provide LB TI WHQA, which largely mirror existing obligations, are both proportionate and justified in view of the competition problems identified. ComReg has considered whether obligations other than those relating to access would in themselves resolve the competition problems identified and does not consider this to be the case. Similarly, the imposition of access obligations on their own also would not likely prevent all possible forms of exploitative/exclusionary behaviour in the LB TI WHQA Market such as excessive pricing, discrimination (on price or quality grounds) or ensure transparency of terms and conditions of access.

Price Control and Cost Accounting Obligations

10.33 The purpose of price control and cost accounting obligations is to ensure that prices charged are not set above efficient cost (or cause a margin squeeze) and to promote efficiency and sustainable retail competition while maximising consumer benefits. As noted in Section 8⁵⁹⁹, Eircom is currently subject to a price control obligation of cost orientation and cost accounting pursuant to the 2008 Decision and the 2012 Pricing Decision.

10.34 In the review of competition problems in Section 7, ComReg considered on a forward-looking basis the scope for competition problems to arise absent the imposition of price control and cost accounting obligations. Furthermore, Section 7 identifies a number of competition, efficiency and ultimately consumer impacts arising from LB TI WHQA prices that are set above efficient cost.

⁵⁹⁸ See paragraphs 8.14 to 8.17.

⁵⁹⁹ See paragraphs 8.22 to 8.24.

- 10.35 ComReg proposes that Eircom should be subject to a cost-orientation obligation with respect to access to LB TI WHQA. ComReg's analysis, set out in Section 7, indicates that Eircom has the ability and incentive to engage in excessive pricing in the LB TI WHQA Market, absent regulation. This preliminary view to impose a cost orientation obligation on Eircom also promotes harmonisation and regulatory certainty.
- 10.36 In general, if specific price control obligations are to be meaningful, it may be necessary to have a clear and comprehensive understanding of the costs associated with Eircom's provision of LB TI WHQA products. ComReg proposes to continue to impose a cost accounting obligation on Eircom having regard to its integrated position across several markets (in particular noting its SMP designations in a number of these markets). In the discussion of competition problems (Section 7), Eircom was identified as having particular ability and incentives to leverage its SMP position from the LB TI WHQA Market into related markets. There is thus, still a need to ensure sufficient visibility of how costs are allocated across LB TI WHQA and other horizontally and vertically-related inputs. As Eircom is already subject to a cost accounting obligation across a number of regulated markets, including LB TI WHQA, ComReg considers any incremental burden is minimal.
- 10.37 ComReg has considered whether price control obligations alone would be sufficient to address the competition problems identified in Section 7, and does not consider this to be the case. For example, discriminatory behaviour (on price or non-price grounds) or denial of access problems would not be capable of being adequately addressed through such obligations alone.

Accounting Separation Obligations

- 10.38 As noted in Section 8, in general, the purpose of an accounting separation obligation would be to provide a higher level of detail of information than that which can be derived from the statutory financial statements of undertakings designated with SMP, with the objective of reflecting, as closely as possible, the performance of those parts of the undertaking's business were it to operate on a standalone basis. In the case of vertically-integrated undertakings, it can support non-discrimination obligations and prevent unfair cross-subsidies to other services.
- 10.39 Eircom currently has an obligation to maintain separated accounts pursuant to the 2008 Decision and the 2012 Accounting Separation Decision. In Section 7, ComReg has identified potential competition problems associated with possible price-related leveraging to be particularly pertinent in the case of Eircom (absent regulation) which highlights the importance of continuing to ensure a transparent and effective mechanism of accounting separation.

10.40 Having regard to Eircom's integrated position across several related markets (in particular noting its SMP designations in a number of these markets), separated accounts help disclose such possible competition problems and make visible the wholesale and internal transfer prices of a dominant operator's services, thereby facilitating transparency as regards any potential misallocation of costs across different services. The main objective of accounting separation is to make the practical implementation of non-discrimination and cost-orientation transparent by showing cross-subsidisation between products. Requiring separated accounts for the main products and services creates more transparency on internal transfer pricing and repartition of common and joint costs. It is therefore considered proportionate and justified to continue to impose an obligation on Eircom to maintain separated accounts

Determine the Impacts on Stakeholders

10.41 Given that ComReg has proposed to designate Eircom with SMP in the LB TI WHQA Market, it is ComReg's preliminary view, as outlined paragraphs 10.21 to 10.22 above, that the option of regulatory forbearance is not appropriate or justified and can be discounted when considering the impact on stakeholders.

10.42 Having regard to the proposed SMP designation in Section 6 (which requires ComReg to impose at least some level of regulation⁶⁰⁰) as well as the review of competition problems and remedies in Sections 7 and 8 respectively, ComReg has, on an incremental basis, identified why a range of appropriate remedies are necessary, proportionate and justified, while at the same time discounting other remedies where appropriate.

10.43 Having regard to the analysis and assessment of the LB TI WHQA Market, ComReg has now groups remedies into four options for the purpose of considering the incremental impact of each option on stakeholders:

- **Option 1:** Impose Access obligations only;
- **Option 2:** Impose Access, Transparency and Non-Discrimination obligations;
- **Option 3:** Impose Access, Transparency, Non-Discrimination and Price Control and Cost Accounting obligations;
- **Option 4:** Impose Access, Transparency, Non-Discrimination, Price Control & Cost Accounting and Accounting Separation obligations.

⁶⁰⁰ Pursuant to Regulation 8(1) of the Access Regulations and Regulation 27(4) of the Framework Regulations.

Option 1: Impose Access Obligations only		
Impact on Eircom	Impact on Competition	Impact on Consumers
<p>Eircom would benefit from reduced regulatory burden relative to 2008 Decision.</p> <p>There would be increased flexibility for Eircom to use its market power at wholesale level to engage in exploitative behaviour and/or influence market developments at the wholesale/retail level. It could facilitate extraction of excessive rents from LB TI WHQA purchasers and ultimately end-users.</p> <p>Eircom’s incentives to innovate and increase efficiency may be reduced where prices are set above efficient cost are paid for by competitors and, in turn, by their customers.</p> <p>Increased risk of disputes and legal challenges involving Eircom’s LB TI WHQA LL services arising from ineffective transparency and other preventative measures to protect against non-discrimination. Disputes could increase legal and regulatory costs faced by Eircom.</p>	<p>High risk that, even though access mandated in principle, there would be significant scope for it to be effectively undermined through such practices as high or discriminatory pricing, imposing unreasonable terms and conditions, delaying tactics, poor service quality, etc.</p> <p>Where access is provided to downstream competitors on exploitative or discriminatory terms (relative to that provided to Eircom’s own retail arm) this could significantly disadvantage existing rivals and distort existing competition in downstream markets.</p> <p>Ineffective access to LB TI WHQA LLs could also raise barriers to expansion for existing entrants in downstream markets due to inability to guarantee end-to-end connectivity to Eircom’s established customer base.</p> <p>LB TI WHQA prices set above efficient cost would raise financial barriers to entry and expansion for smaller or newer entrants in downstream retail and wholesale markets. Where LB TI WHA prices are set above efficient cost, this could limit scope for downstream pricing innovations by Eircom’s downstream rivals.</p> <p>Scope would persist for Eircom to squeeze competitors across related wholesale/retail markets through its relative pricing of LB TI WHQA.</p> <p>Regulatory certainty is reduced given wholesale access and pricing uncertainty. A potentially increased incidence of disputes could also raise legal and regulatory costs for Eircom’s rivals.</p> <p>Differences in regulatory approach between Ireland and other EU countries and deviations</p>	<p>There would be a risk that, even though access to LB TI WHQA is mandated, there would be significant scope for it to be effectively undermined through such practices as high or discriminatory pricing, unreasonable terms and conditions, delaying tactics, poor service quality, etc.</p> <p>If downstream competition is distorted or investments discouraged due to ineffective LB TI WHQA access, consumers would potentially have reduced service choice, quality and innovation.</p> <p>Above-cost LB TI WHQA could put upward pressure (or slow the rate of any decline) on retail prices. Above-cost LB TI WHQA may also limit scope for retail pricing innovations thereby potentially depriving consumers of bundles/packages.</p>

Option 1: Impose Access Obligations only		
	from European Commission guidance could also generate legal uncertainty for pan-European operators.	

Option 2: Impose Access, Transparency and Non-Discrimination Obligations		
Impact on Eircom	Impact on Competition	Impact on Consumers
<p>Eircom would benefit from a reduced regulatory burden relative to 2008 Decision.</p> <p>There would be increased flexibility for Eircom to use its market power at wholesale level to engage in exploitative behaviour and/or influence market developments at the wholesale/retail level. It could facilitate extraction of excessive rents from LB TI WHQA purchasers and ultimately end-users.</p> <p>Eircom’s incentives to innovate and increase efficiency may be reduced where LB TI WHQA prices set above efficient cost are paid for by competitors and, in turn, by their customers.</p> <p>While risk of disputes and legal challenges involving Eircom’s LB TI WHQA services might be eased somewhat relative to Option 1, risk of disputes would persist due to lack of direct regulatory oversight in respect of Eircom’s LB TI WHQA prices. Disputes could increase the legal and regulatory costs faced by Eircom.</p>	<p>While risk of impeding access to LB TI WHQA may be moderated somewhat relative to Option 1, effective access to LB TI WHQA may still be undermined through excessive LB TI WHQA pricing (including in circumstances where Eircom is vertically integrated).</p> <p>Where access is provided to downstream competitors on exploitative terms, this could significantly disadvantage existing rivals and distort existing competition in downstream markets.</p> <p>Ineffective access to LB TI WHQA (through exploitative or exclusionary pricing) could also raise barriers to expansion for existing competitors in downstream markets.</p> <p>Regulatory certainty is improved although remains reduced given wholesale pricing uncertainty. A potentially increased incidence of disputes could also raise legal and regulatory costs for Eircom’s rivals.</p> <p>Differences in regulatory approach between Ireland and other EU countries (broader set of obligations are generally envisaged by other NRAs) and deviations from European Commission guidance could also generate legal uncertainty for pan-European operators considering investments in Ireland.</p>	<p>There would be a risk that, even though LB TI WHQA is mandated in principle, there would be significant scope for it to be effectively undermined through such practices as excessive pricing, and ultimately consumers would be impacted (through say, higher prices).</p> <p>If downstream competition is distorted or investments discouraged due to ineffective LB TI WHQA access, consumers would potentially have reduced service choice, quality and innovation.</p> <p>Above-cost LB TI WHQA prices could put upward pressure (or slow the rate of any decline) on retail prices. Above-cost LB TI WHQA prices would also limit scope for retail pricing innovations thereby potentially depriving consumers of new and innovative bundles/packages involving fixed data (and other) services.</p>

Option 3: Impose Access, Transparency, Non-Discrimination and Price Control & Cost Accounting Obligations		
Impact on Eircom	Impact on Competition	Impact on Consumers
<p>As Eircom is currently subject to price control and cost accounting obligations (including cost orientation) pursuant to the 2008 Decision, the incremental burden of such obligations is not likely to be significant.</p> <p>Cost orientation ensure that Eircom can recovers its efficiently incurred cost plus a reasonable rate of return.</p> <p>Eircom’s regulatory burden under Option 3 would not be significantly less than under Option 4 (below) as Eircom is already subject to accounting separation obligations in other SMP markets. Under Option 3 there would be increased flexibility for Eircom to obscure internal transfer prices and the real costs of LB TI WHQA if no accounting separation obligation imposed. There would thus be an increased opportunity for Eircom’s non-discrimination and/or price control obligations to be undermined.</p> <p>Risk of disputes and legal challenges involving Eircom’s LB TI WHQA prices may be eased relative to Options 1 and 2 due to price control obligation. However, a lack of adequate cost accounting data may generate uncertainty regarding Eircom’s compliance with non-discrimination and price control obligations, thus also contributing to risk of disputes.</p>	<p>Regulating LB TI WHQA prices at efficient cost would reinforce the effectiveness of the access, transparency and non-discrimination obligations thus reducing risk of competitive distortions in downstream retail markets and potentially lowering barriers to expansion for SPs.</p> <p>Regulating LB TI WHQA prices at efficient cost would potentially provide greater scope for retail pricing innovations by rivals.</p> <p>Greater consistency with EU guidance and other regulatory decisions would promote legal certainty and a more predictable environment.</p> <p>While greater certainty that LB TI WHQA prices would be set at efficient cost potentially moderates risk of disputes relative to Options 1 and 2, the lack of transparency of Eircom’s costs due to absence of a cost accounting systems may still contribute to an ineffective cost orientation price control and scope for discrimination (relative to its own retail arm) and consequent risk of disputes.</p>	<p>Availability of LB TI WHQA access would facilitate interoperability of services by enabling subscribers of other networks to call Eircom’s subscribers.</p> <p>Reduced risk of competitive distortions and more level playing field in downstream markets and greater wholesale pricing certainty helps facilitate retail price and service innovations (e.g. in terms of packages/bundles offered).</p> <p>Reduced risk of high LB TI WHQA prices being passed through to end-users in form of higher prices relative to Options 1 and 2 above.</p> <p>Potential for discriminatory behaviour due to lack of accounting separation may impact on downstream competition and investment with consequent negative implications in terms of price and service choice over time.</p>

Option 4: Impose Access, Transparency, Non-Discrimination, Price Control & Cost Accounting and Accounting Separation Obligations		
Impact on Eircom	Impact on Competition	Impact on Consumers
<p>Existing regulatory burden on Eircom as per the 2008 Decision would remain.</p> <p>Risk of disputes and legal challenges involving Eircom's LB TI WHQA prices would be eased relative to Options 1, 2 and 3.</p>	<p>As set out for Option 3 above, greater consistency with EU guidance and other regulatory decisions would promote legal certainty and a more predictable environment for potential investors.</p> <p>Greater certainty that LB TI WHQA prices would be set at efficient cost, complemented by greater visibility of internal transfers to support non-discrimination obligation, moderates risk of disputes relative to Options 1, 2 and 3.</p>	<p>Reduced risk of competitive distortions and more level playing field in downstream markets and greater wholesale pricing certainty helps facilitate retail price and service innovations (e.g. in terms of packages/bundles offered).</p> <p>Reduced risk of above-cost LB TI WHQA prices being passed through to end-users in form of higher prices relative to Options 1 and 2 above.</p>

Assess the Likely Impacts and Choose the Best Option

- 10.44 In the discussion on the proposed approach on remedies set out in Section 8, ComReg has taken full account of its obligations under Regulation 8(6) of the Access Regulations (including that any proposed remedies are to be based on the nature of the problem identified), as well as its relevant objectives as set out under Section 12 of the Communications Regulation Acts 2002 (as amended).
- 10.45 ComReg's preliminary view is that, absent regulation, there is the potential and incentive for Eircom, as the SP designated with SMP in the LB TI WHQA Market, to engage in exploitative and exclusionary behaviours which would impact on competition and consumers. In Section 7 ComReg provided examples of potential competition problems and the impact of these on competition and consumers. ComReg has also highlighted its objectives in regulating the LB TI WHQA Market in paragraph 10.12 above, in particular, preventing restrictions or distortions of competition in affected downstream retail and wholesale markets and helping to ensure that consumers can achieve maximum benefits in terms of price, choice and quality of service.
- 10.46 The imposition of appropriate ex ante remedies to address such competition problems was discussed and justified in Section 7 and each of the specific remedies is designed to promote the development of effective competition and to protect end-users. Given that a full suite of remedies is proposed to be applied on Eircom, it is ComReg's belief that the risk of competition problems and associated impacts should be minimised. This will ultimately be to the benefit of Service Providers and end-users of downstream retail and wholesale services.
- 10.47 The proposed maintenance of existing regulation on Eircom in the LB TI WHQA Market (i.e. Option 4) is considered justifiable in that it is required to ensure that Eircom does not exploit its market power at the wholesale level to the detriment of competition in both related markets, and to the ultimate detriment of consumers. In Section 7, a broad range of potential competition problems were identified for Eircom, which has the ability and incentives for both exploitative and exclusionary practices given its continuing significant presence in upstream and downstream markets.
- 10.48 In particular, Eircom's strong position on downstream retail markets (see Section 3 of this Consultation) implies that the ability and incentives to engage in vertical leveraging/foreclosure would seem particularly strong for Eircom. In view of its control over a number of key input markets, Eircom has the ability and incentives to impede downstream competitors through price (e.g. excessive/ discriminatory pricing) and/or non-price means (e.g. by not facilitating access to essential services in the LB TI WHQA Market). The regulatory obligations proposed in designed to specifically address the competition problems identified and are proportionate in that they are the least burdensome means of achieving this objective.

HB TI WHQA Market and MI WHQA Market Considerations

HB TI WHQA Market

- 10.49 As set out in Section 6, ComReg is of the preliminary view that no undertaking is likely to have SMP in the HB TI WHQA Market. As a result, no regulatory obligations are being imposed on any SP in this market.
- 10.50 At present, Eircom is regulated in the HB TI WHQA Market area by virtue of the 2008 Decision. As a result of the analysis contained in this Consultation, it is proposed that existing regulatory obligations on Eircom will be withdrawn in the HB TI WHQA Market (see Section 9 above). In particular, ComReg's preliminary view is that high and non-transitory barriers to entry no longer appear to be present, and that the HB TI WHQA Market is tending towards effective competition. ComReg's preliminary finding that no undertaking is likely to have SMP in the HB TI WHQA Market implies that the market is no longer susceptible to ex ante regulation and, therefore, regulation is not warranted.
- 10.51 On that basis, the removal of regulation from the HB TI WHQA Market has been proposed. Therefore, ComReg's regulatory options in the HB TI WHQA Market are limited to the timing of the withdrawal of existing regulation. As noted in Section 9, ComReg has proposed a sunset period of 6 to 9 months for the withdrawal of existing remedies imposed upon Eircom in the HB TI WHQA Market.
- 10.52 This will, amongst other things, allow Access Seekers sufficient time to seek alternative forms of HB TI WHQA supply, if required, and thereby preserve continuity in the supply of retail/wholesale services (were Eircom to withdraw, or significantly alter, its terms and conditions of HB TI WHQA supply following deregulation). To ultimately ensure the protection of consumer interests, ComReg also proposes to continue to monitor the effectiveness of competition within the HB TI WHQA Market, notwithstanding the proposed removal of regulation. In this respect, ComReg reserves its right to re-examine competitive conditions within the HB TI WHQA Market and, if appropriate, to intervene accordingly.
- 10.53 ComReg also proposes that, from the effective date of the final decision arising from this Consultation, Eircom will no longer have to meet new requests for access in the HB TI WHQA Market in the context of regulatory requirements (although is free to do so commercially). ComReg believes that this is appropriate given it would be illogical to maintain this requirement for a short period which, having expired, would then be subject to commercial negotiation. Additionally, ComReg notes that the tendency towards sufficient competitive constraints being present in the HB TI WHQA Market means that this market outcome now facilitates the removal of existing obligations on Eircom. These dynamics also facilitate a reduction in Eircom's regulatory burden and given the market can operate effectively absent regulation.

10.54 Given regulatory obligations cannot be imposed in the HB TI WHQA Market (aside from the limited obligations regarding the proposed sunset period), this RIA does not further consider regulatory options with respect to the HB TI WHQA Market.

MI WHQA Market

10.55 As set out in Section 6, ComReg is of the preliminary view that no undertaking is likely to have SMP in the MI WHQA Market. As a result, no regulatory obligations are being imposed on any SP in this market.

10.56 At present, Eircom is regulated in the MI WHQA Market area by virtue of the 2008 Decision. As a result of the analysis contained in this Consultation, existing regulatory obligations on Eircom will be withdrawn in the MI WHQA Market. In particular, ComReg's preliminary view is that high and non-transitory barriers to entry are no longer present, and that the MI WHQA Market is tending towards effective competition. ComReg's preliminary finding that no undertaking is likely to have SMP in the MI WHQA Market implies that the market is no longer susceptible to ex ante regulation and, therefore, regulation is not warranted.

10.57 On that basis, the removal of regulation from the MI WHQA Market has been proposed. Therefore, ComReg's regulatory options in the MI WHQA Market are limited to the timing of the withdrawal of existing regulation. As noted in Section 9, ComReg has proposed a sunset period of 6 to 9 months for the withdrawal of existing remedies imposed upon Eircom in the MI WHQA Market.

10.58 This will, amongst other things, allow Access Seekers sufficient time to seek alternative forms of MI WHQA supply, if required, and thereby preserve continuity in the supply of retail/wholesale services (were Eircom to withdraw, or significantly alter, its terms and conditions of MI WHQA supply following deregulation). To ultimately ensure the protection of consumer interests, ComReg also proposes to continue to monitor the effectiveness of competition within the MI WHQA Market, notwithstanding the proposed removal of regulation. In this respect, ComReg reserves its right to re-examine competitive conditions within the MI WHQA Market and, if appropriate, to intervene accordingly.

10.59 ComReg also proposes that, from the effective date of the final decision arising from this Consultation, Eircom will no longer have to meet new requests for access in the MI WHQA Market in the context of regulatory requirements (although is free to do so commercially). ComReg believes that this is appropriate given it would be illogical to maintain this requirement for a short period which, having expired, would then be subject to commercial negotiation. Additionally, ComReg notes that the tendency towards sufficient competitive constraints being present in the MI WHQA Market means that this market outcome now facilitates the removal of existing obligations on Eircom. These dynamics also facilitate a reduction in Eircom's regulatory burden given the market can operate effectively absent regulation.

10.60 Given regulatory obligations cannot be imposed in the MI WHQA Market (aside from the limited obligations regarding the proposed sunset period), this RIA does not further consider regulatory options with respect to the MI WHQA Market.

Conclusion

- 10.61 ComReg considers that it has met the condition of transparency by setting out the potential requirements on Eircom in the LB TI WHQA Market, outlining the justification for the proposed obligations, and issuing a detailed and reasoned public consultation on these matters.
- 10.62 ComReg invites comments from interested parties on the above RIA and its underlying analysis.

Question 8: Do you agree with ComReg's preliminary conclusions on the Regulatory Impact Assessment? Please explain the reasons for your answer, clearly indicating the relevant paragraph numbers to which your comments refer, along with all relevant factual evidence supporting your position

11. Next Steps

- 11.1 The consultation period will run from 18 August 2016 to 14 October 2016 and all comments on the issues set out in this Consultation are welcome.
- 11.2 The task of analysing responses received will be made easier if all comments are referenced to the specific question numbers as set out previously in this Consultation and summarised in Appendix: 9.
- 11.3 Having analysed and considered the comments received, ComReg will review the proposals set out in this Consultation, maintain or amend its proposals, as appropriate, including with respect to the draft measures set out in the Draft Decision Instrument at Appendix: 8 below.
- 11.4 Having regard to Regulation 27(1) of the Framework Regulations, ComReg will consult with the Competition and Consumer Protection Commission on its preliminary views on the Relevant WHQA Market(s).
- 11.5 ComReg will then notify its final draft measures to the European Commission, other NRAs and BEREC, pursuant to Regulation 13 of the Framework Regulations. Taking utmost account of any comments received from the European Commission as well as from the other aforementioned parties, ComReg will then seek to adopt and publish the final decision in its subsequent Response to Consultation and Decision.
- 11.6 In order to promote further openness and transparency, ComReg will publish all responses to this Consultation (including any correspondence received in the course of the consultation and prior to the issue of the final decision), subject to the provisions of ComReg's guidelines on the treatment of confidential information in ComReg Document No. 05/24.⁶⁰¹ ComReg appreciates that many of the issues raised in this Consultation may require respondents to provide confidential information if their comments are to be meaningful. As it is ComReg's policy to make all responses available on its website and for inspection generally, respondents to this Consultation are requested to clearly identify confidential material within their submissions and place any such confidential material in a separate Appendix to their response. Such material will be treated subject to the provisions of ComReg's guidelines on the treatment of confidential information as set out in ComReg Document No. 05/24.
- 11.7 In submitting comments, respondents are also requested to provide a copy of their submissions in an unprotected electronic format in order to facilitate their subsequent publication by ComReg.

⁶⁰¹ Guidelines on the Treatment of Confidential Information, Response to Consultation, [ComReg Document 05/24](#), March 2005.

Appendix: 1 OXERA Report

[PARTIALLY REDACTED]

A 1.1 The Oxera Report is available at ComReg Document 16/69a. Note that the Oxera Report has been partially redacted due to confidentiality.

Appendix: 2 2014 Market Research

A 2.1 The 2014 Market Research for the WHQA Market Analysis is available at the ComReg Document 16/69b.

Appendix: 3 Leased Line Data Issues and Treatment

Overview

- A 3.1 This appendix briefly sets out the issues encountered by ComReg in the collection of quantitative data from SPs relating to the WHQA markets. More importantly, it also details the issues which arose in the treatment of this data and actions taken by ComReg to remediate these issues so that the data could be refined to reasonably accurate levels. This was to allow ComReg to derive, amongst other things, reasonable reliable information for its analysis of market shares, bandwidth usage, and geographic distribution and thereby, assist in its analysis of the WHQA markets.
- A 3.2 Capitalised terms set out in this Appendix have, unless otherwise defined herein, are as already set out earlier in this Consultation.
- A 3.3 As noted in the introduction, Section 1⁶⁰² as part of the analysis of the WHQA markets ComReg gathered data from Authorised Undertakings under SIRs. In this respect, ComReg issued 3 separate SIRs seeking quantitative data covering the period 2009 to 2015. ComReg notes that the UK NRA, Ofcom, conducted a consultation on its data gathering process and treatment and analysis of this data in October 2014.
- A 3.4 It had abandoned a previous data gathering attempt in 2013 due to the difficulties it had encountered in collating complete and robust customer location data.
- A 3.5 The data Ofcom required was similar to that which ComReg had sought in its SIRs. Ofcom encountered difficulties in its data cleansing exercise and reported achieving approximately 75% accuracy of geographical data in its BCMR Consultation published May 2015.⁶⁰³
- A 3.6 ComReg notes that it had extensively sought to engage with SPs extensively prior to issuing its SIRs having issued these SIRs in draft form and/or soliciting feedback on them. This was an iterative process and the 3 draft SIRs were amended based on direct feedback and knowledge gained by the project team during the entire process.
- (a) The first SIR, covering the time period 2009 – 2013, was issued on 11 February 2014 with responses to be submitted by 8 April 2014 (**‘2009 to 2013 SIR’**).
- (b) The second SIR, covering the time period 2014, was issued on 5 December 2014 with responses to be submitted by 13 February 2015 (**‘2014 SIR’**).

⁶⁰² See paragraphs 1.44 to 1.51.

⁶⁰³ See <http://stakeholders.ofcom.org.uk/consultations/bcmr-data-analysis/> (**‘BCMR Consultation’**) for further details.

- (c) The third SIR, covering the time period 2015, was issued 15 January 2016 with responses to be provided by 11 March 2016 ('**2015 SIR**').
- A 3.7 ComReg engaged with its two consultants, Tera and Oxera, in the course of this undertaking. Tera reviewed ComReg's analysis of SPs' responses to the 2009 to 2013 SIR and the 2014 SIR. This review covered the collection and treatment of data by ComReg using 'method 1' described below. Tera's resultant report (the '**Tera Report**') is published in Appendix: 6 of this Consultation. Also published is ComReg's response to the Tera Report which is set out in in Appendix: 7.
- A 3.8 Oxera was also engaged to assist ComReg in conducting the market definition and SMP assessment of this market review and the Oxera Report is published in Appendix 1 of this Consultation. As part of its work it conducted a review of ComReg's geographical analysis of the 2014 data which calculated market shares inside and outside a set of 209 designated business parks⁶⁰⁴ as discussed in detail in the discussions contained in various sections throughout this paper. These parks were chosen on the basis of having presence of 2 alternative competitive networks (or barriers to providing service within the park by both alternative SPs was considered extremely low).
- A 3.9 Oxera also completed its own geographical analysis of the same data (it however, excluded circuits of bandwidth $\leq 2\text{Mb/s}$) using the same list of 209 business parks though using an alternate methodology in order to allow a separate validation of results to be made. Its approach was to run a "top down" word search algorithm of premises addresses⁶⁰⁵ to identify those located within the list of business parks. ComReg's approach was a "bottom up" visual line by line inspection of each address. The Oxera results are published in tables 8.1 and 8.2 of the Oxera Report which is published in Appendix: 1 while ComReg's results are published in Figures A4.33 to A4.35 of Appendix: 4.
- A 3.10 There was also a further slight difference in approaches taken to the calculation of the respective market shares inside and outside business parks, by ComReg and Oxera. ComReg excluded any off-net circuits from its counts in order to remove any double counting of re-sold circuits and thereby, avoided any overestimation of the overall circuit volumes. This also allocates circuits to the originating SP and avoids for instance, attributing market shares to SPs which have little or no infrastructure. ComReg believes that this method more accurately reflects markets shares. In addition to calculating retail and wholesale shares, ComReg completed a Modified Greenfield market shares calculation which Oxera did not undertake. These different approaches resulted in slight and inconsequential variations between the markets share calculations of ComReg and Oxera (for inside and outside business parks).

⁶⁰⁴ 209 Business / Retail Parks and 3rd level campuses, published in Appendix: 5 of this Consultation.

⁶⁰⁵ Such addresses were, where available, identified by SPs in their responses to the SIRs, in particular, addresses of customers served with LLs.

Methodologies used for counting market shares

A 3.11 ComReg's analysis of SPs' data utilised 3 approaches in its calculation of market shares for the LLs falling within the MI WHQA Market. These are outlined below.

Method 1

A 3.12 The first approach 'Method 1' was based on a count of a LL product dependent combination of logical and physical circuits (for MI circuits only -TI circuits were counted using 'Method 2' in all cases). This was carefully computed to avoid any instances of double counting. i.e., where a premises had both a logical and physical LL circuit attributed to it. This largely concerned the treatment of BT's and Eircom's responses to the SIRs (there were a small volume of logical circuits recorded by SPs other than these), both of which listed logical and physical circuits for their most prevalent LL products.

A 3.13 These products are Eircom's wholesale Next Generation Ethernet service which consists of WSEA⁶⁰⁶ physical and WSEA logical circuits (and its retail equivalent) and BT's wholesale and retail Etherway (physical) and Etherflow (logical) services⁶⁰⁷. The logical circuits were counted for both operators as these reflected the bandwidths provided to the customer and therefore, would generate accurate bandwidth consumption and corresponding trends over time.

A 3.14 The physical circuits were mostly 1 Gb/s 'access bearers', with there also being a small number of 10 Gb/s access bearers reported. If these access bearers had been used to measure bandwidth data consumption, in ComReg's view it would have considerably overestimated the bandwidth of circuits delivered/consumed by end-users and distorted the analysis. For instance, approximately 3% of Eircom's wholesale logical circuits in-situ at the end of 2015 were less than or equal to 100 Mb/s. If physical circuits were used for the same computation, our initial interpretation would have been incorrectly shown that over 3% of circuits were 1 Gb/s.

A 3.15 Where the physical circuits attracted a charge, this was counted in the overall revenues and market valuations in all cases. Both SPs above did however, list circuits of other LL products where only the physical circuit was recorded. In such cases the information provided by the SPs registered the actual bandwidth delivered to the end-user and so was likely to yield accurate results for bandwidth utilisation and trends.

⁶⁰⁶ Wholesale Symmetrical Ethernet Access product description available at http://www.openeir.ie/Products/Data/Next_Generation_Ethernet/.

⁶⁰⁷ http://www.btirelandwholesale.com/pdf/wholesale_ethernetConnect_datasheet_03.pdf and http://www.btireland.com/pdfs/terms/BT_Ethernet_Connect_Ireland_Onlineversion_2.pdf.

- A 3.16 The majority of other SPs listed all their circuits as physical circuits and did not list bearers other than interconnection circuits which are out of scope for the purposes of circuit counts. This reflects the fact that they do not charge end-users for access bearers and recorded only the bandwidth delivered. This also ensured that the distribution of these circuits across the bandwidth splits ($\leq 2\text{Mb/s}$, $\leq 20\text{Mb/s}$ etc.) was sufficiently accurate and would contribute to an overall analysis for bandwidth usage and trends.
- A 3.17 A possible drawback of this method was that in theory, there may not necessarily be a one-to-one correspondence between physical and logical circuits in particular situations. A retail multi-site customer could have one additional physical circuit over and above the number of logical circuits it requires. This could occur in of deployments of hub-and-spoke arrangements. In such a scenario a Head Quarter ('HQ') site with "N" number of satellite/branch premises requires N+1 physical circuits to connect all company locations (N for branches and 1 for the HQ). It may however, require only N logical circuits, one associated with every branch to connect each to the HQ. Inspection of the data however, demonstrated that there was generally a one-to-one relationship between physical and logical circuits so this potential effect did not appear to be significant for the analysis.
- A 3.18 Method 1 treats the WHQA markets as national in scope and no sub-geographical analysis was attempted. It is also the methodology which was inspected by Tera for the purpose of its Tera Review.
- A 3.19 Subsequently, ComReg decided to investigate possible geographic variations in the WHQA markets and to calculate geographic market shares. Two other approaches were deployed which solely investigated the location of the physical access portion of the LLs provided by SPs.

Method 2

- A 3.20 The second 'Method 2' approach was based on a count of recorded instances of physical circuits listed by each operator ignoring whether or not the circuits were single ended (e.g. connecting a customer to a local exchange or data platform) or if they were "end-to-end" ("double-ended") circuits (e.g. recording a single leased line connections between 2 separate customer premises, with 2 distinct customer locations, A and B end address identified).
- A 3.21 The volume of double ended circuits (having customer A and B end locations) recorded by operators was low relative to overall volumes. It was more pronounced for SPs which concentrated on specific types of service, particularly large bandwidth national backhaul type services which, according to data provided by such SPs, consisted of separate physical connections at each end.
- A 3.22 ComReg considered that the possible effect of undercounting (caused by not recording both physical ends of such double-ended circuits) would cancel itself out overall as all SP data was treated in the same manner. However, an additional methodology (Method 3 discussed below) was then adopted to observe if the resultant market shares differed to any appreciable extents (particularly any shares possibly approaching SMP volumes) when using the different counting methodologies.

Method 3

- A 3.23 The third approach undertaken was based on a count of all physical connections as well as identifying whether or not these connections were located inside or outside of an identified set of business parks. To do this, it necessitated the splitting of end-to-end circuits into 2 separate physical counts and treating each physical connection as a single unit. This was the approach taken by NRAs such as Ofcom in the UK and RTR in Austria. This methodology has the advantage of recognising the fact that each double-ended circuit has 2 physical local ends, one or both which could be inside or outside the identified set of business parks under consideration. An issue with this method was that all SPs did not distinguish between interconnection type circuits (single ended) and end-to-end (double-ended) LLs in all instances and/or did not necessarily record both physical ends.
- A 3.24 ComReg calculated MI WHQA Market shares using all 3 methods outlined above to observe if there were any significant difference in the overall results. Results using the 3 methods are published in Appendix: 4.

TI Circuit Count

- A 3.25 For the LB TI WHQA Market and HB TI WHQA Market, LLs were treated as single-ended, unique instances in all cases. Each circuit contributed a single unit count to the respective totals for bandwidths up to and including 2Mb/s and above 2Mb/s. No significant sub-geographic analysis of the TI market was undertaken given the dynamics identified in the SMP analysis section of this paper i.e. the large market share of Eircom in the LB wholesale TI markets and that no SMP was found in HB wholesale TI market.

Pricing and Market Share Information

- A 3.26 It should be noted that circuit volumes (rather than revenues) were the basis upon which market shares were calculated. Revenue figures were used to calculate overall market valuations but the analysis revealed that detailed revenue data provided by SPs in response to the SIRs was not sufficiently reliable for making useful comparisons or trend analysis. For example, for pricing comparison of circuits of particular bandwidths. This was due to a number of reasons. It was not practical to compare circuits having similar local access distances as these circuit lengths (distance between the customer premises to the local exchange or serving node) was not supplied (usually because it was not available). The pricing information was also not considered sufficiently reliable due to bundling of services with LLs and significant pricing variations between a SPs' own pricing and also in comparison to other SPs. For these reasons, the current regulated prices were used as a proxy for analysis purposes. The pricing comparison analysis using Eircom's publicly available wholesale pricing and calculated by Oxa are reproduced in the Retail and Wholesale sections of this paper where retail and wholesale pricing was discussed. This was also the approach used by the other NRAs referred to above.

Conclusion

- A 3.27 It was necessary for ComReg to repeatedly revert to SPs during the course of the data collection and data cleansing process. Conference calls and meetings were conducted with nearly all SPs in order to seek to obtain reliable and stable data sets upon which market shares, geographic analysis, trend data and other information could be derived. Given these difficulties, including the significant time taken to obtain data from SPs and to inspect each circuits address identified by SPs (a line by line assessment for the geographical analysis inside and outside of business parks), ComReg has not yet completed a line by line inspection of the 2015 data sets. ComReg has, therefore, calculated national market shares for this time period and not those for inside and outside the 209 set of business parks. However, this analysis will be completed prior to the final decision on the market analysis being made.
- A 3.28 ComReg considers that its approach was thorough and systematic and is a reasonable basis upon which the analysis can be undertaken. Table A3.1 below lists the issues experienced in the course of the data gathering and data cleansing exercise and the actions taken by ComReg to counteract these issues.

Table A3.1: List of issues encountered in SIR data submissions and treatment

Issue	Ref.	Examples	Action taken	Result
Data not provided	1.1	Customer premises address incomplete/not provided	SPs contacted to supply information and Internet search conducted to confirm address where feasible (e.g. retail end-user name provided). Reasonable assumptions taken in relation to location inside/outside business park (e.g. schools, government agencies etc.).	Correct address/location confirmed. Location inside/outside business park confirmed.
	1.2	Circuit bandwidths not provided.	SPs contacted to supply information. Bandwidth assumed to be same as similar circuit in cohort.	Completed data supplied or assumptions made in a minority of instances.
	1.3	Financial information not provided - circuit rental/revenue not provided.	SPs contacted to supply information.	Financial information supplied/clarified.
	1.4	Network maps not provided or incomplete.	SPs contacted to supply information.	Maps provided.
Extraneous data provided	2.1	Broadband circuits included in LL lists.	Broadband circuits removed.	Data cleansed
	2.2	Dark fibre leases included in LL lists.	Dark Fibre leases removed –checked against lists of infrastructure sales/leases.	Data cleansed.
	2.3	Voice circuits included: voice interconnection circuits included; Primary and Partial Rate Access, analogue PSTN & SIP Trunks included.	All voice circuits removed.	Data cleansed.
Discrepancies between years	3.1	2014 data highlighted issues with 2013 data for some SPs, including large differences or contradictory data between years.	SPs contacted to provide corrected 2013 data. [REDACTED] confirmed that its 2013 data was not fully reliable and source data could not be retrieved to refresh its submission. ComReg decided to use it as a “best efforts” indication of volumes/market shares.	Corrected data supplied where available/feasible and supplier data used were relevant.

<p>Discrepancies between wholesale supplier and purchaser data</p>	<p>4.1</p>	<p>Some purchasers reported widely different off-net volumes to those reported as sold to it by its supplier. Minor differences were accepted (these could be explained by variations in delivery of off-net circuits to issuing of invoices to downstream customers).</p>	<p>Supplier/Purchaser data compared at individual circuit level. Supplier information generally accepted as this would be subject to greater internal scrutiny (sales secured & posted revenue figures). Pro-rata ratio of supplier data was used to categorise sale to retail & wholesale sales (allowing for those reported as network inputs, where applicable). SPs contacted in some cases.</p>	<p>Corrected data supplied or supplier data used.</p>
<p>On-Net and off-Net circuits confused</p>	<p>5.1</p>	<p>Off-net lines were included in on-net list and vice-versa. E.g. 3< [REDACTED]</p> <p>Customers connected with 3rd part dark fibre listed as off-net. These are considered on-net as were LLU connected premises as these are treated as upstream inputs.</p>	<p>Supplier/Purchase data compared. SP contacted in some cases.</p>	<p>Data allocated to correct lists.</p>
<p>Geographic Data (absent or of poor quality)</p>	<p>6.1 6.2 6.3 6.4</p>	<p>Customer addresses absent/incomplete. X, Y geo coordinates of customer premises not used/ not available. Postal codes not used. Local exchange/PoP Exchange information not provided.</p>	<p>A geographic count methodology was applied to the MI count only. This was based on premises being inside or outside 209 designated business</p>	<p>ComReg and Oxera counts yielded broadly similar results for market shares inside and outside the set of 209 business parks.</p>

	6.5	Incorrect local exchange/PoP information provided e.g. Premises in Kerry shown connected to Dublin Node.	parcs/third level campuses. The ComReg “bottom up” count entailed inspection of each individual address of both ends of circuits, aided by internet searches and reasonable assumptions e.g. that schools, government offices (Department of Social protection etc.) were outside business parks.	
	6.6	Highly concentrated networks – e.g. single PoP covering Greater Dublin Area – did not facilitate localised geographic analysis using exchange/POP e.g., could not list customers of all SPs connected to respective Blanchardstown POPs.	Oxera’s “top down” count was calculated on a word search of addresses based on all physical ends (double-ended) where these were supplied by the SP.	
Circuit count unit	7.1	Single ended and double-ended circuits were not recorded in uniform manner by SPs. Majority of SPs did not record logical circuits. Eircom and BT recorded logical circuits.	The counting of physical ends was adopted as the primary method to calculate market shares (other than the inside & outside business park calculation). 3 approaches (Methods 1, 2 & 3) were taken to measure market shares as described above. TDM circuits were counted as single ended physical circuits. TDM interconnection circuits were not included in the circuit count and 50% of this revenue was attributed to leased lines (50% was considered to part of voice interconnection services).	The single-ended physical count was taken as the standard comparator in the discussion sections within the paper. The initial method adopted, Method 1, used to calculate national market shares included logical circuit and this method was that checked and verified by Tera. The 3 different approaches used broadly corroborated overall results for market share calculations.
Revenue/rental data inconsistent	8.1	Extremely large revenue/rental associated with particular circuits.	SPs contacted to confirm information. Compared to supplier information for off-net lines.	Revenue/rental figures clarified and corrected and allocated to circuits in appropriate manner for complex commercial arrangements to allow calculation of
	8.2	No revenue or inconsistent revenue attributed to some circuits e.g. X[] was an	SPs contacted to confirm information. Some revenues attributed to layer 3 or non-access services	

		outlier, its pricing was considerably higher than other SPs.	and therefore, eliminated. Some SPs confirmed that local access could be provided FOC for bundled services.	overall market valuations. The output did not allow for useful comparison of pricing across bandwidths.
	8.3	Revenue attributed to groups of circuits in complex retail and wholesale commercial or arrangements or bundles e.g. Network outsourcing.	SPs contacted to confirm details of commercial arrangements for access portion of services and revenue distributed on pro-rata bandwidth basis.	Average pricing allocated on per Mb/s basis.
	8.3	Full revenue for international circuits attributed to national or local access portion of circuits.	SPs contacted to confirm sales value of access portion. Or Value of average of national cohort of similar circuits applied.	Revenue value for international circuits corrected.
	8.4	Revenue for "Commercial B-end" (circuits where commercial arrangement is owned by business unit outside Ireland) was not known or readily available to SP. ComReg had issued detailed advice on how such circuits may be treated.	SPs contacted to confirm sales value attributable to national or local access portion. Or Value of average of national cohort of similar circuits applied.	Data corrected accordingly.
Incorrect Technology listed	9.1	Inconsistent technology allocated to some circuits by SPs i.e. circuits with Ethernet product description and bandwidths (10, 100Mb/s) were listed as TDM circuits. Similarly, some circuits with TDM bandwidth (e.g.34Mb/s) were listed as Ethernet.	Circuits reallocated to correct technology.	Data corrected accordingly
Retail and Wholesale customers confused	10.1	Many SPs had customer's circuits listed on wholesale rather than retail list and vice-versa e.g. 3<[REDACTED] was listed as a wholesale customer in several instances.	Customer lines reallocated to correct list.	Data cleansed accordingly.

		Wholesale circuit lists should only have included circuits sold to other Authorised Operators.		
Absence of line length information	11.1	Eircom was the only operator to record line length information in any form	Line length analysis was not undertaken.	N/a.

Appendix: 4 ComReg Data – Graphs of Market Shares ✂[REDACTED]

A 4.1 These have been redacted due to confidentiality.

Figure A4. 1 Total Retail HQA market shares –all technologies, circuit counting method 1 ✕[REDACTED]

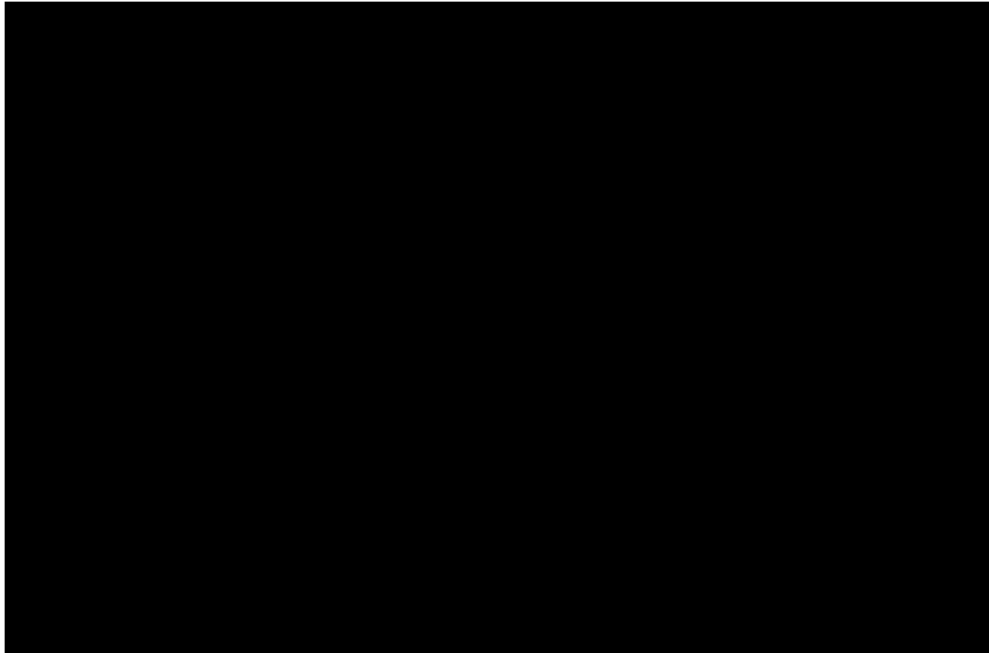


Figure A4. 2 Total Retail HQA market shares –all technologies, circuit counting method 2 ✕[REDACTED]

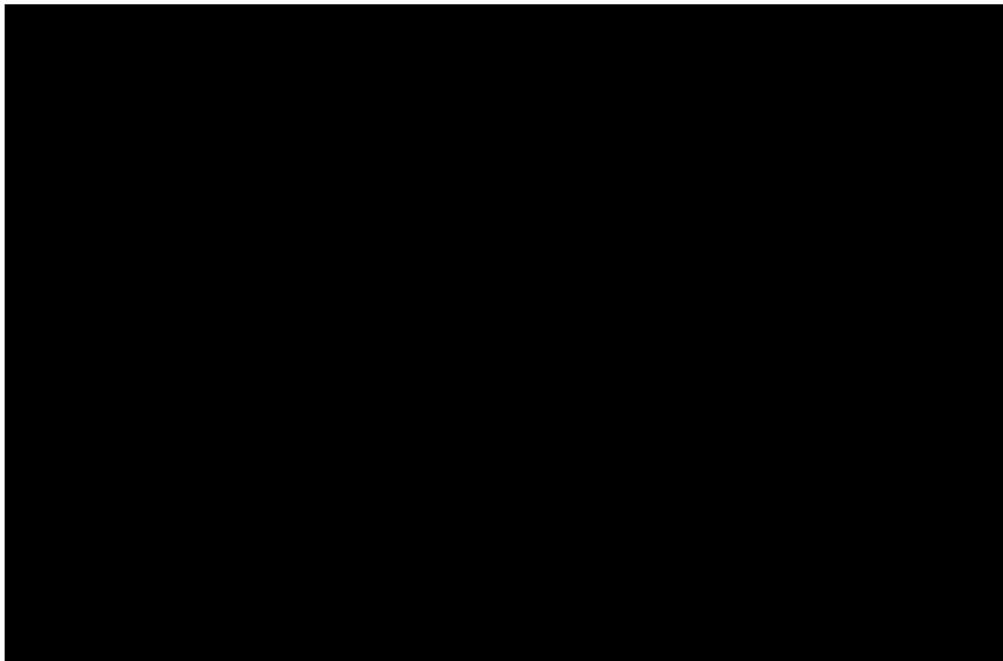


Figure A4. 3 Total Retail HQA market shares –all technologies, circuit counting method 3 ✕ [REDACTED]

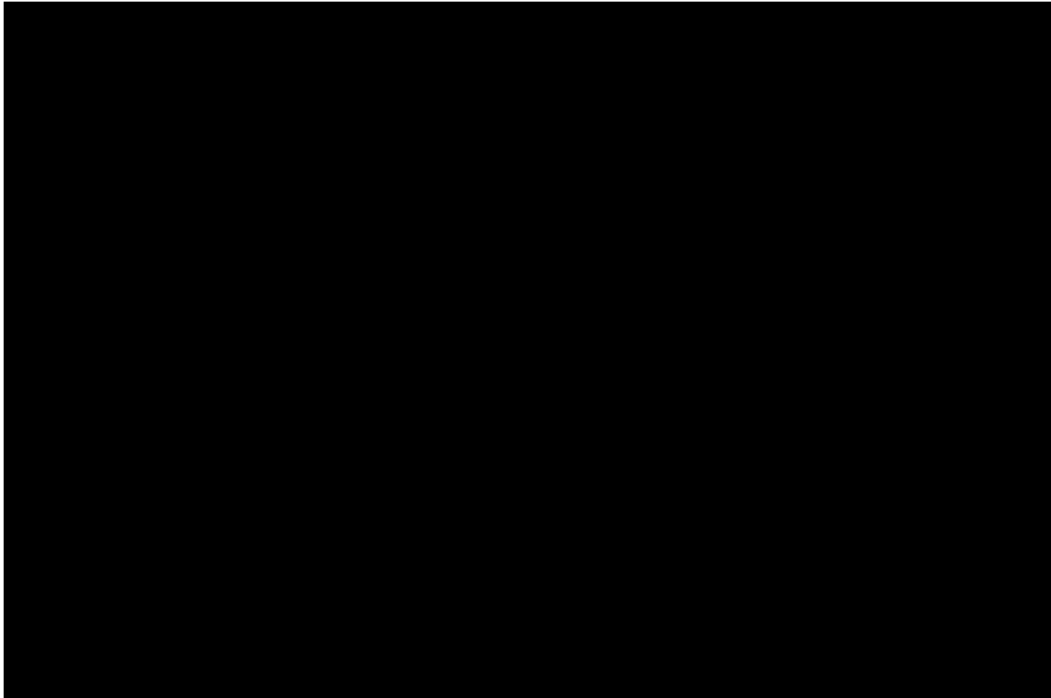


Figure A4. 4 Total Retail HQA market shares absent regulation–all technologies, circuit counting method 1 ✕[REDACTED]

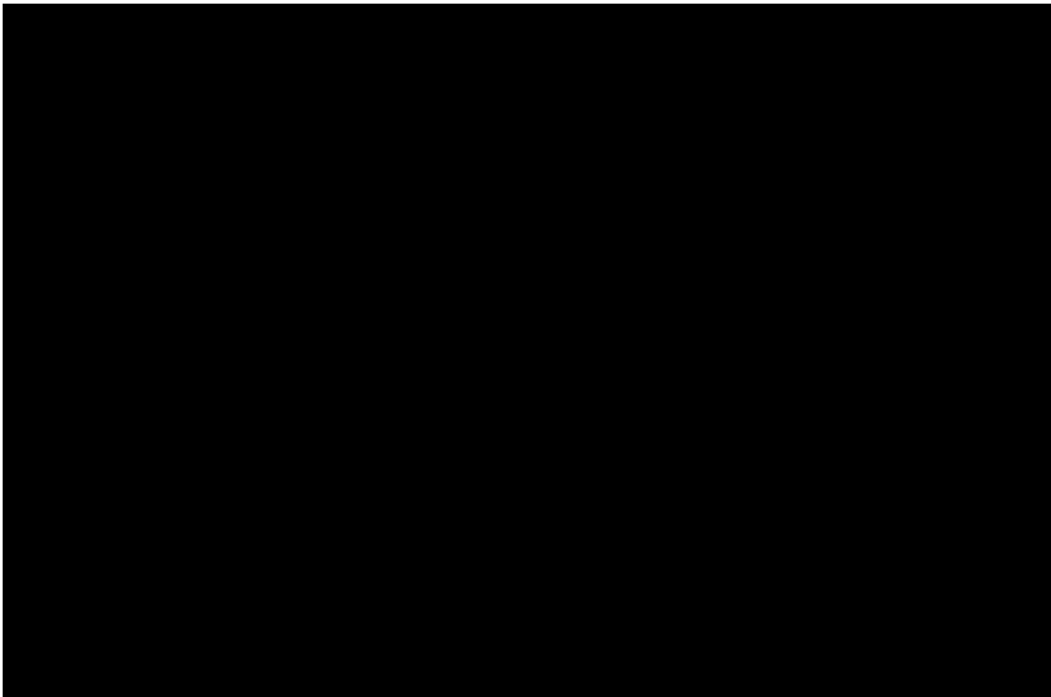


Figure A4. 5 Total Retail HQA market shares absent regulation—all technologies, circuit counting method 2 ✕[REDACTED]

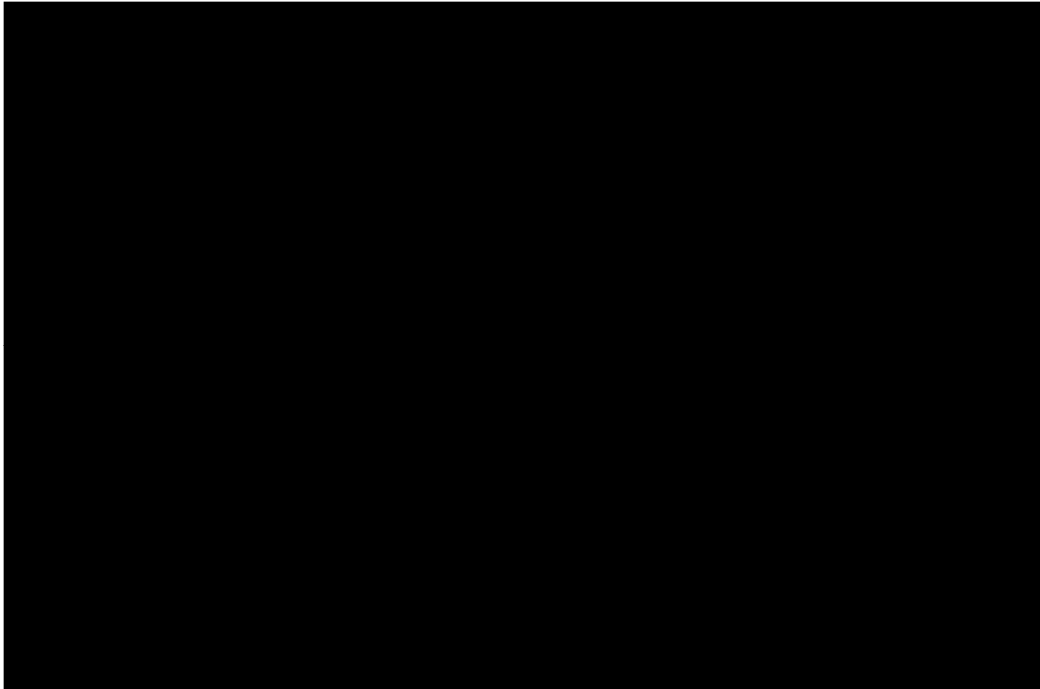


Figure A4. 6 Total Retail HQA market shares absent regulation—all technologies, circuit counting method 3 ✕[REDACTED]

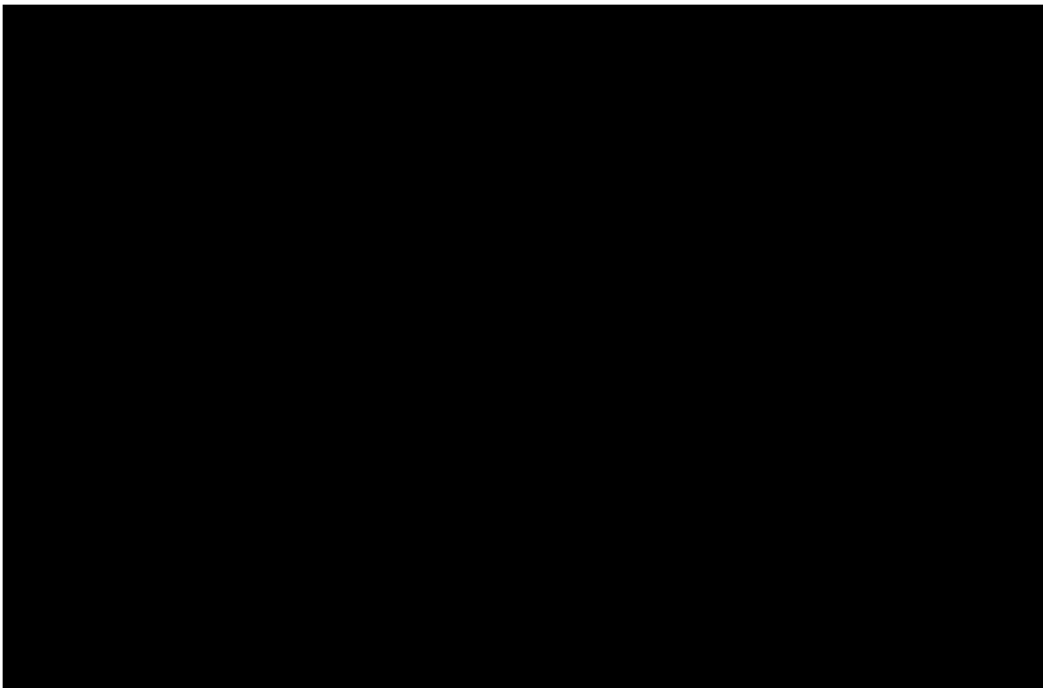


Figure A4. 7 Total Retail TI market shares, circuit counting method 2 (method 2 was used exclusively for counting TI circuits) ✕[REDACTED]

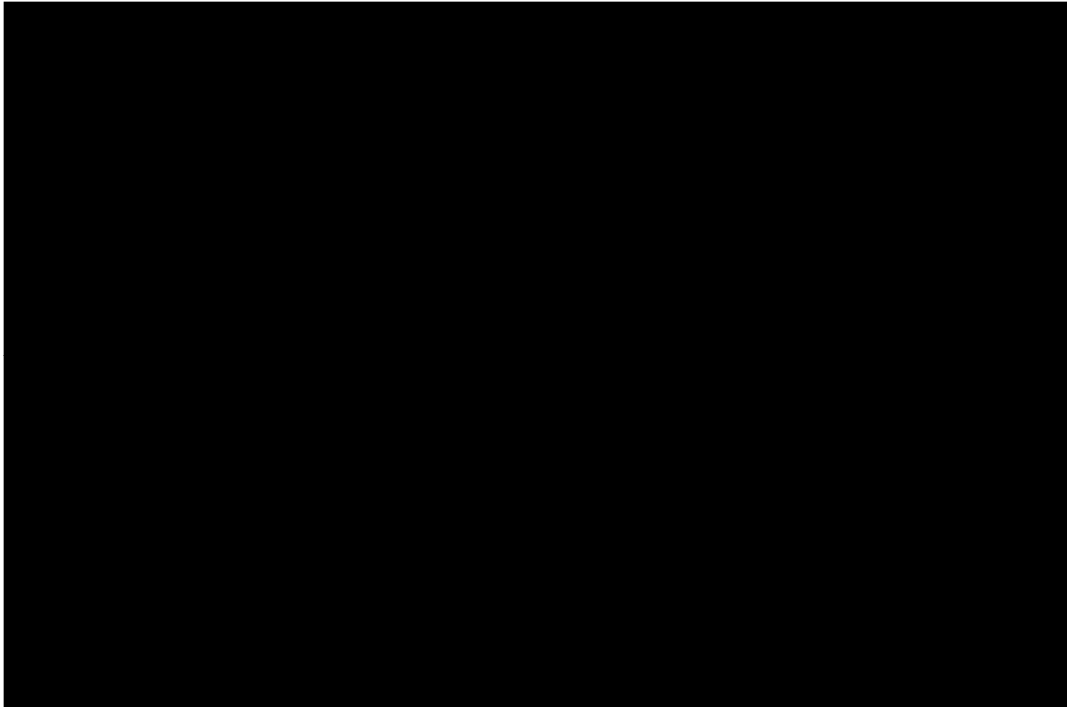


Figure A4. 8 Total Retail TI market shares absent regulation, circuit counting method 2 (method 2 was used exclusively for counting TI circuits) ✕[REDACTED]

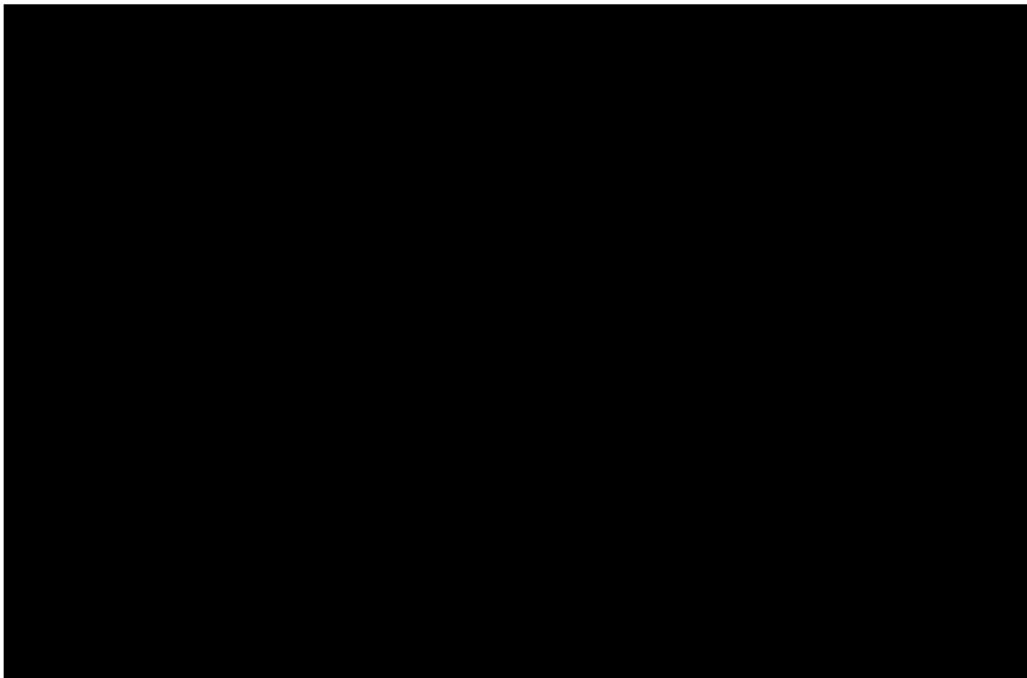


Figure A4. 9 Retail Low Bandwidth TI market shares ($\leq 2\text{Mb/s}$), circuit counting method 2 (method 2 was used exclusively for counting TI circuits) \times [REDACTED]

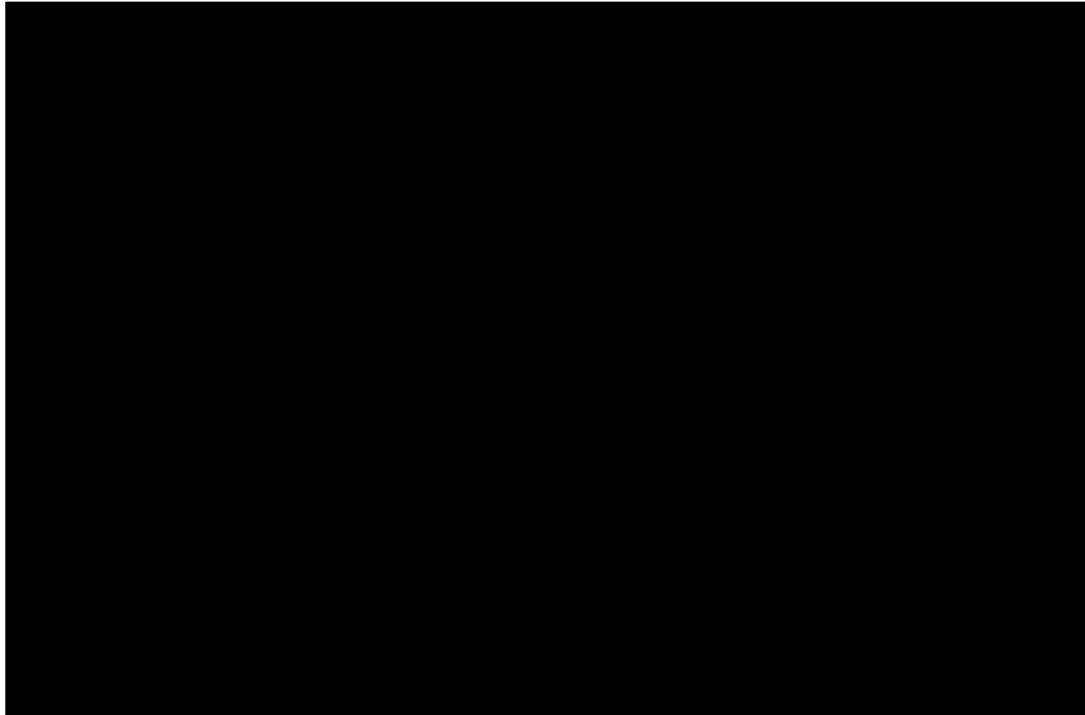
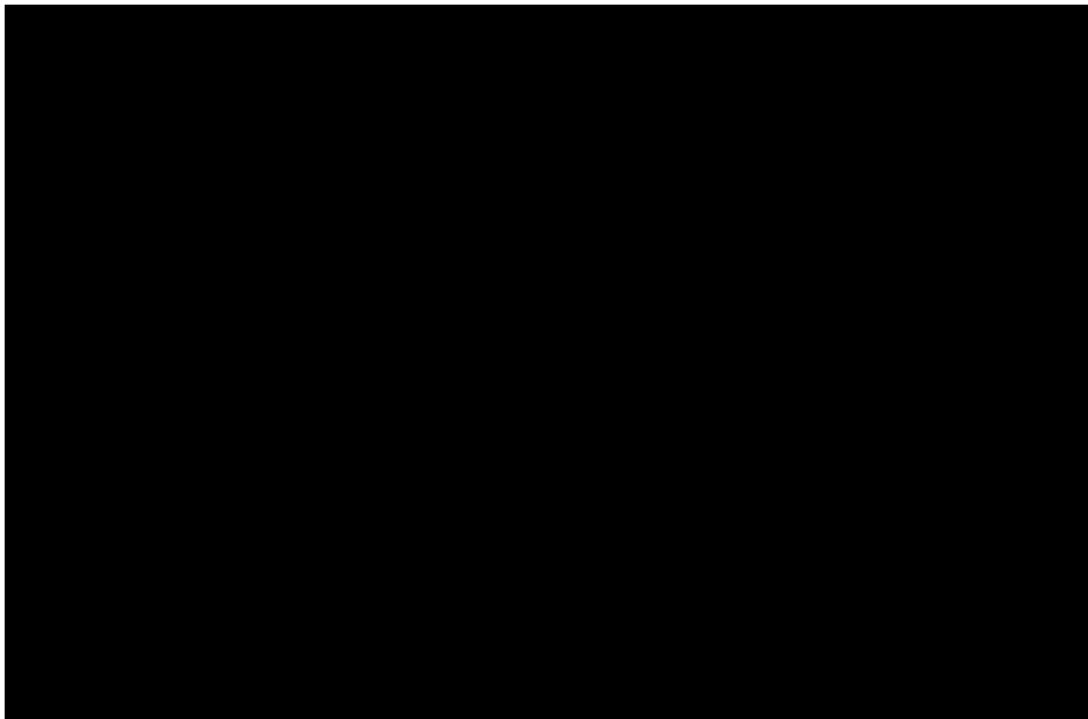
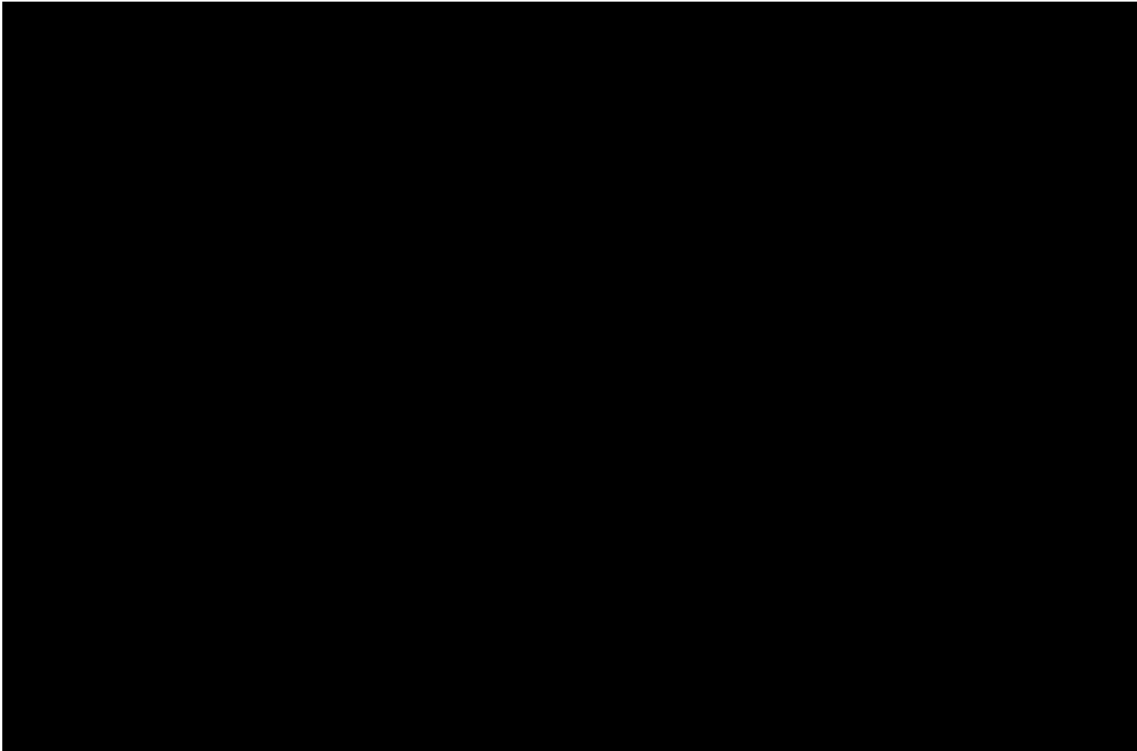


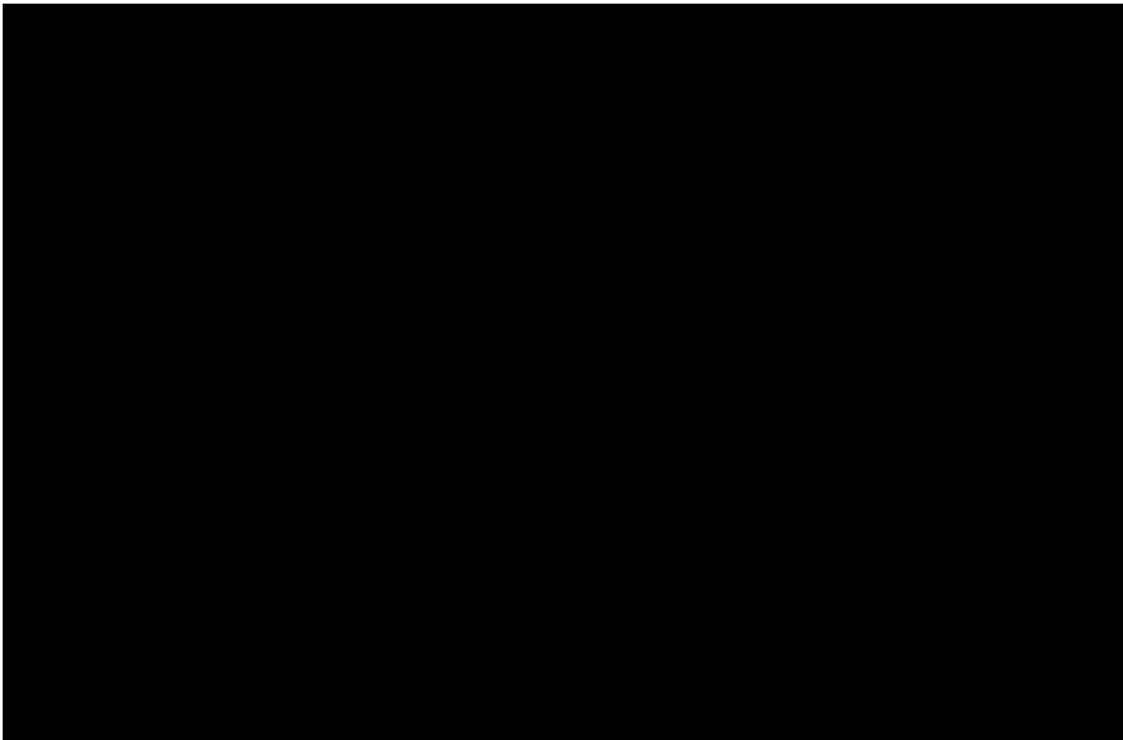
Figure A4. 10 Retail Low Bandwidth TI market shares ($\leq 2\text{Mb/s}$) Absent Regulation, circuit counting method 2 (method 2 exclusive for counting TI circuits) \times [REDACTED]



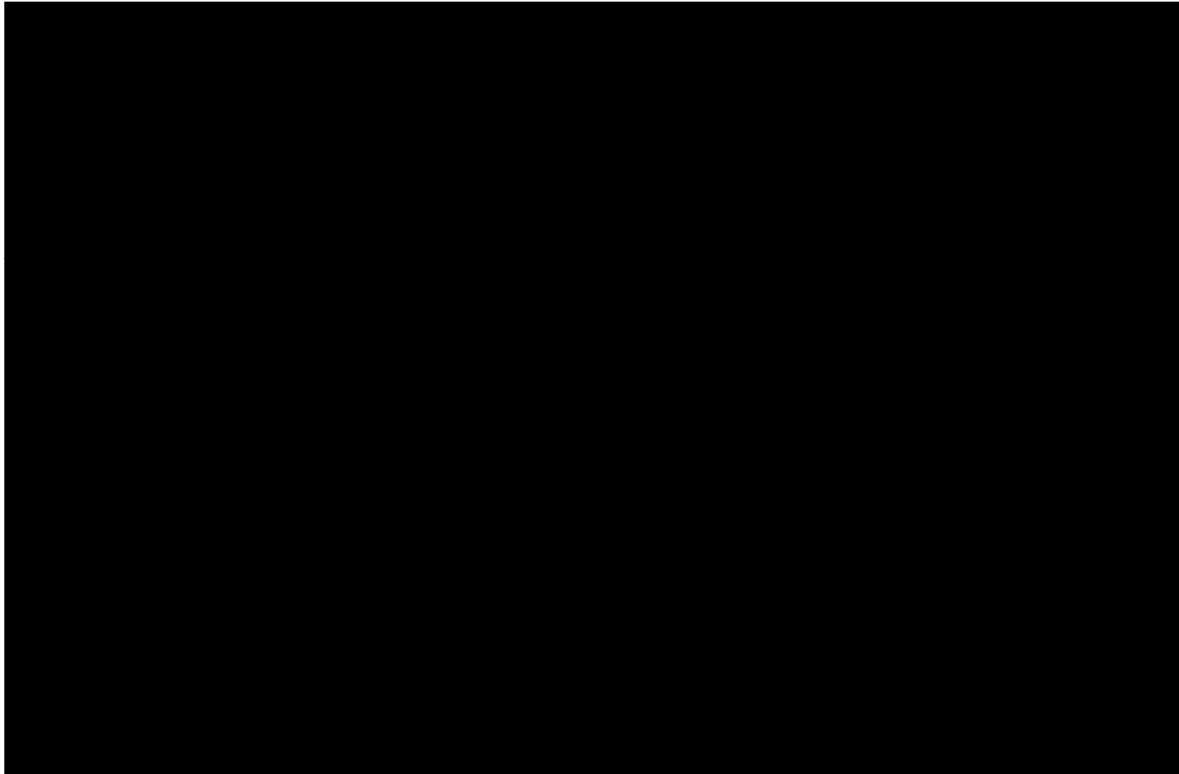
**Figure A4. 11 Retail MI market shares, circuit counting method 1
⌘[REDACTED]**



**Figure A4. 12 Retail MI market shares, circuit counting method 2
⌘[REDACTED]**



**Figure A4. 13 Retail MI market shares, circuit counting method 3
⌘[REDACTED]**



**Figure A4. 14 Retail MI market shares absent regulation, circuit counting
method 1 ⌘[REDACTED]**

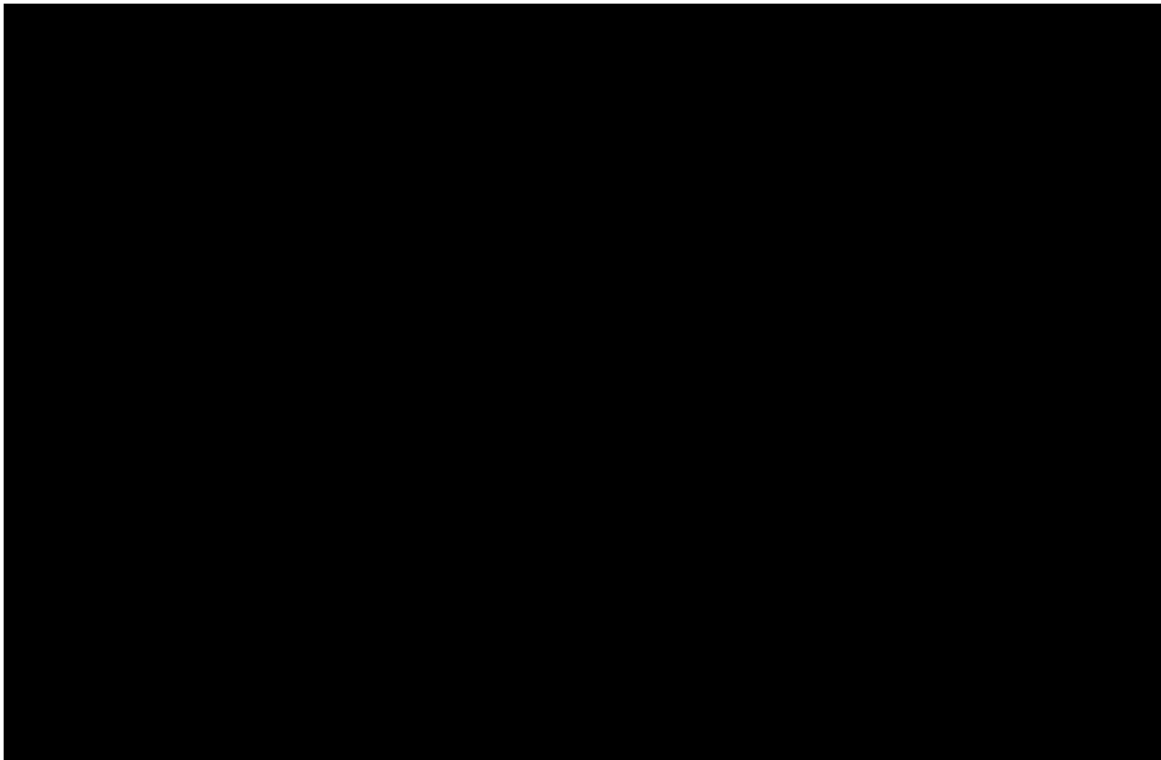


Figure A4. 15 Retail MI market shares absent regulation, circuit counting method 2 ✕[REDACTED]

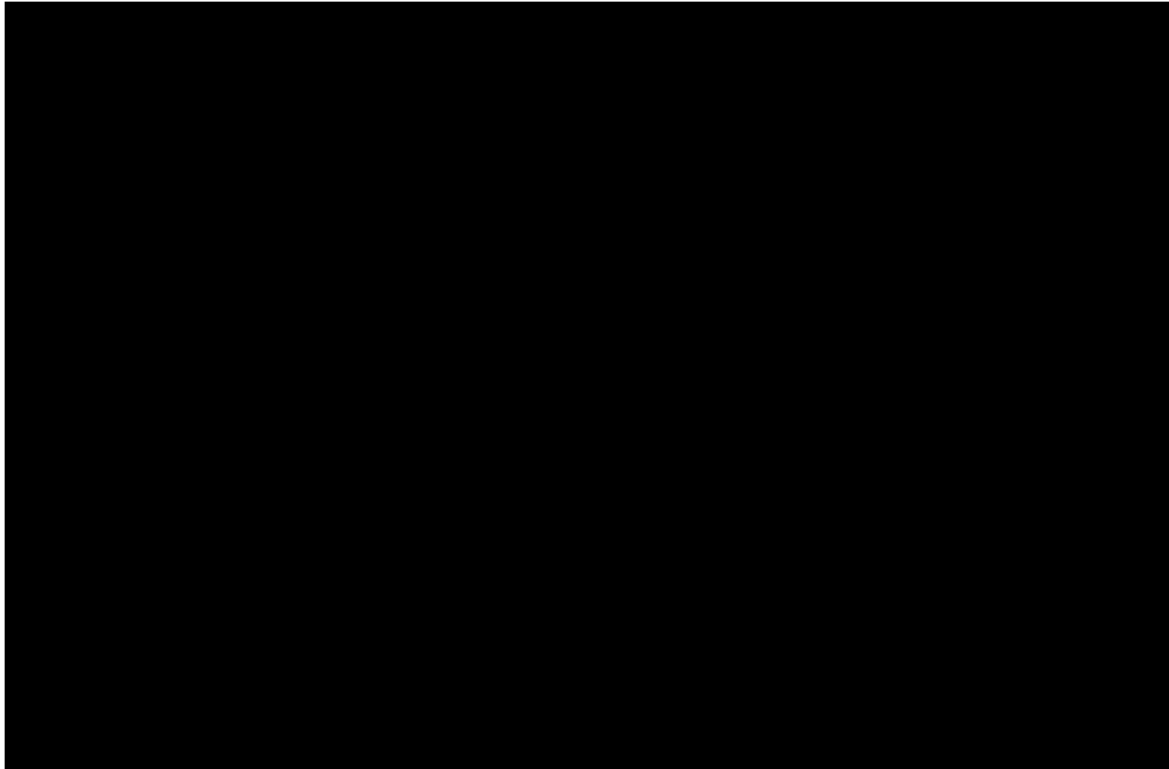


Figure A4. 16 Retail MI market shares absent regulation, circuit counting method 3 ✕[REDACTED]

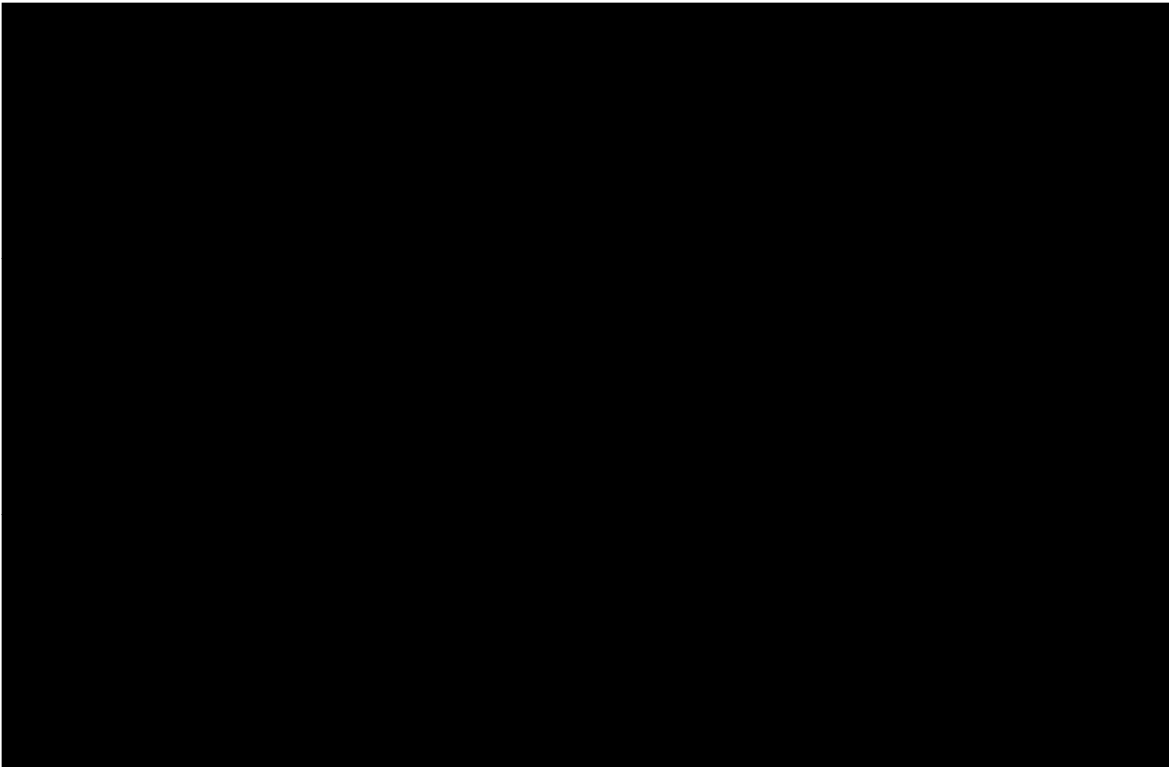


Figure A4. 17 Wholesale market shares of On-Net circuits, all technologies, circuit counting method 1 ✕[REDACTED]

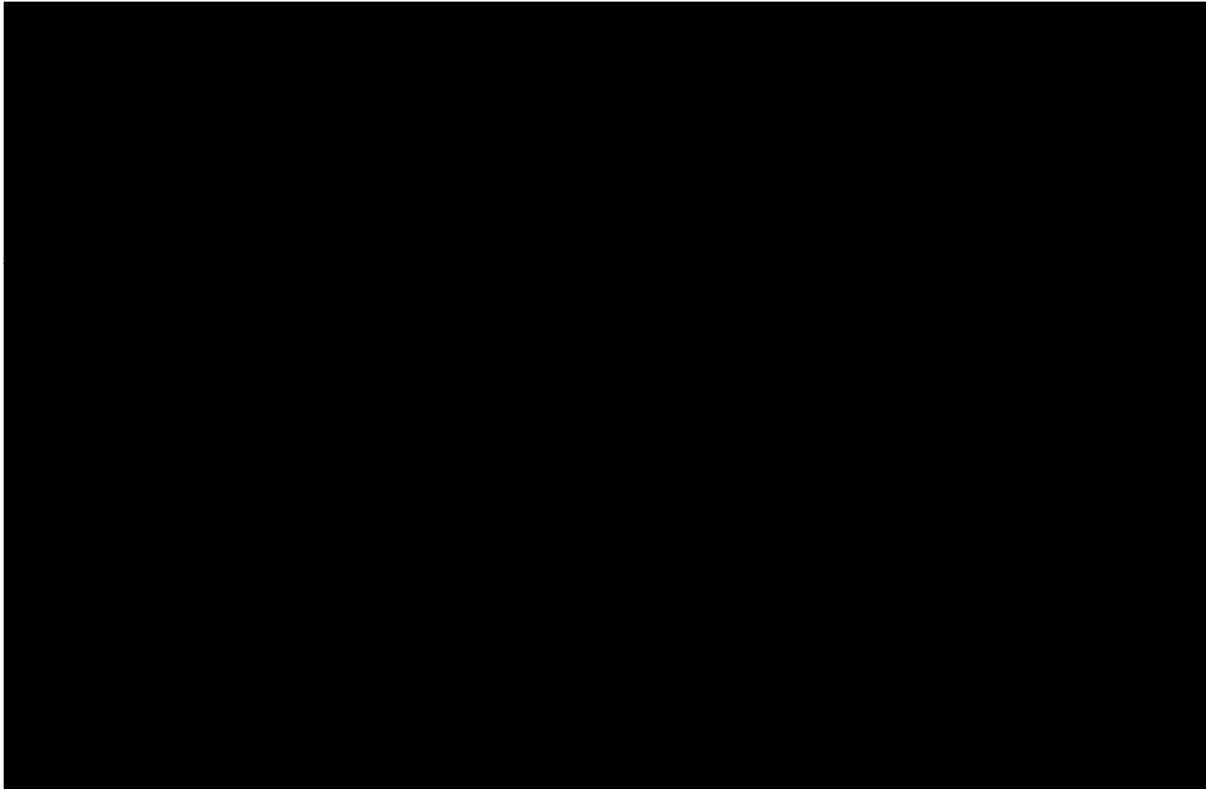


Figure A4. 18 Wholesale market shares of On-Net circuits, all technologies, circuit counting method 2 ✕[REDACTED]

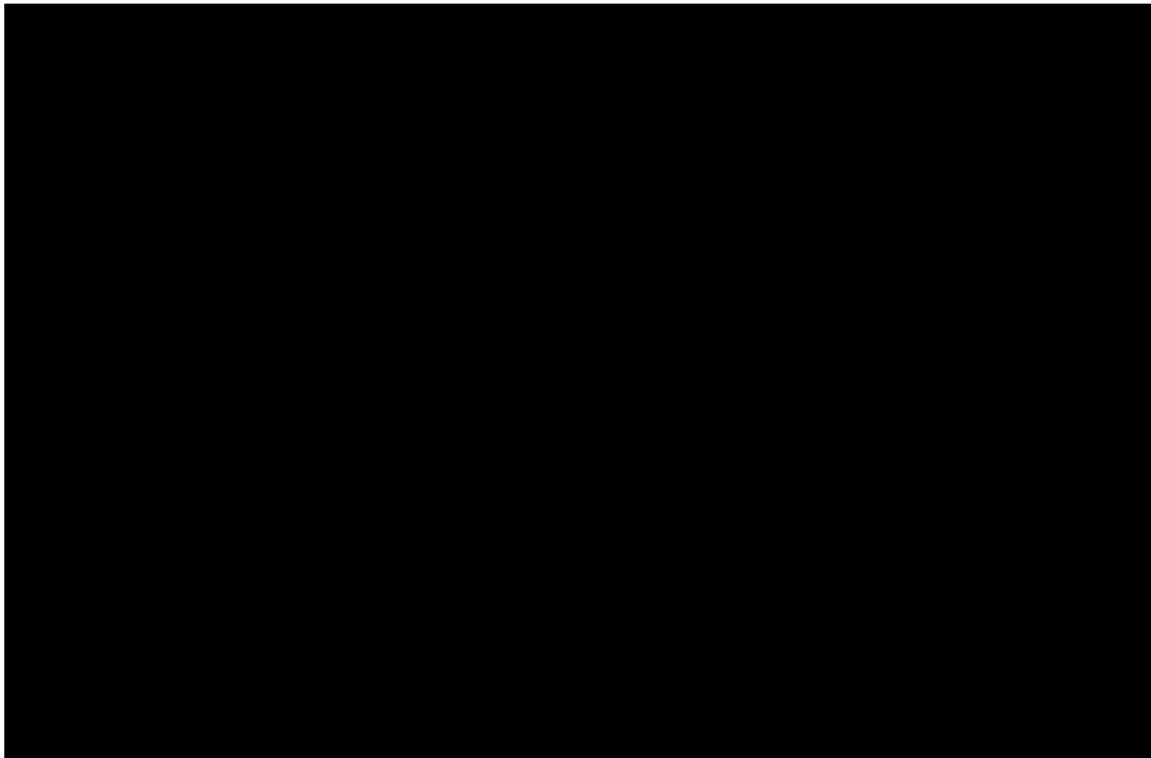


Figure A4. 19 Wholesale market shares of On-Net circuits, all technologies, circuit counting method 3 ✕[REDACTED]

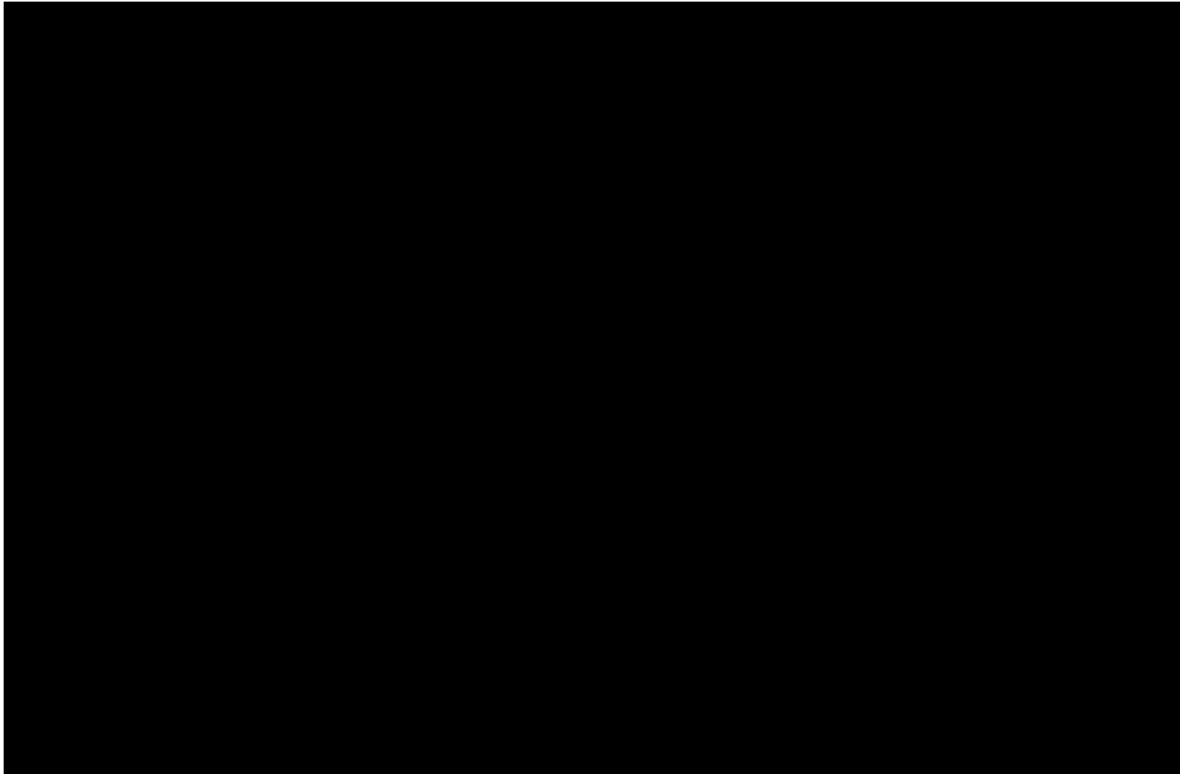


Figure A4. 20 Wholesale market shares absent regulation, all technologies, circuit counting method 1 (Modified Greenfield Approach) ✕[REDACTED]

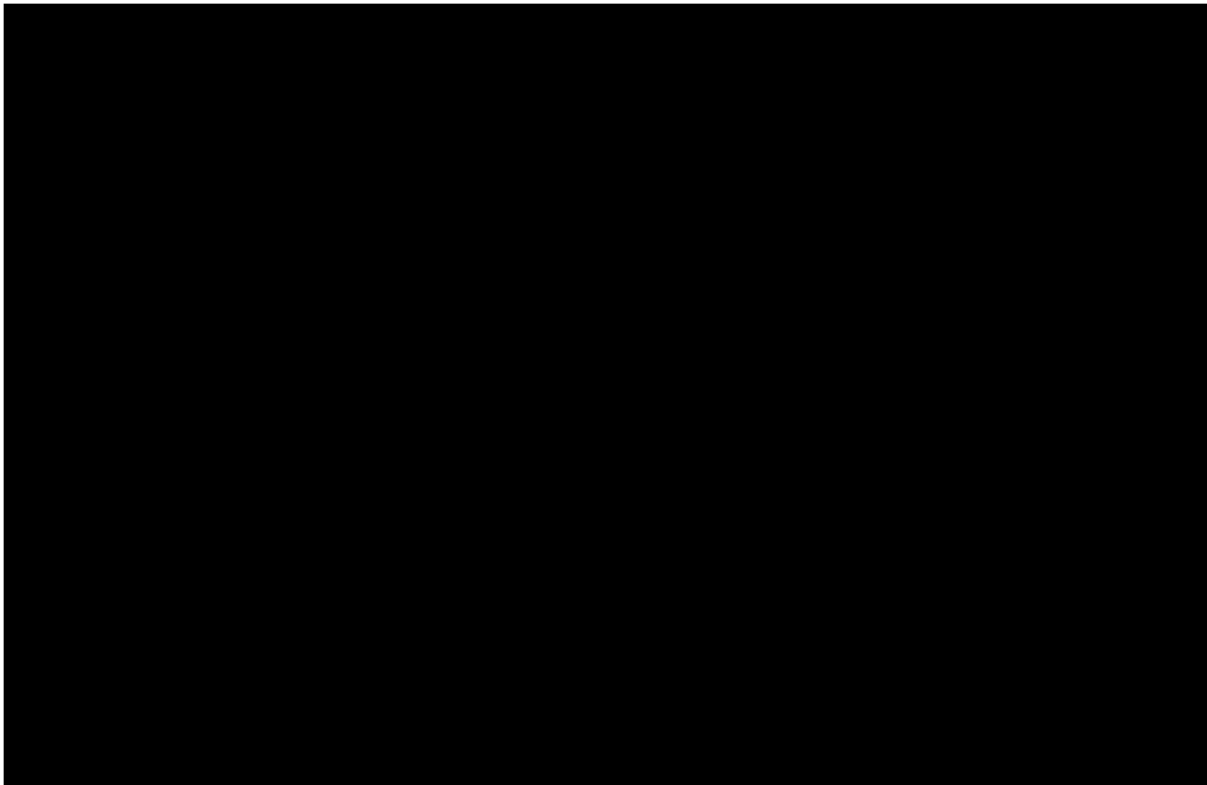


Figure A4. 21 Wholesale market shares absent regulation, all technologies, circuit counting method 2 (Modified Greenfield Approach) ✕[REDACTED]



Figure A4. 22 Wholesale market shares absent regulation, all technologies, circuit counting method 3 (Modified Greenfield Approach) ✕[REDACTED]

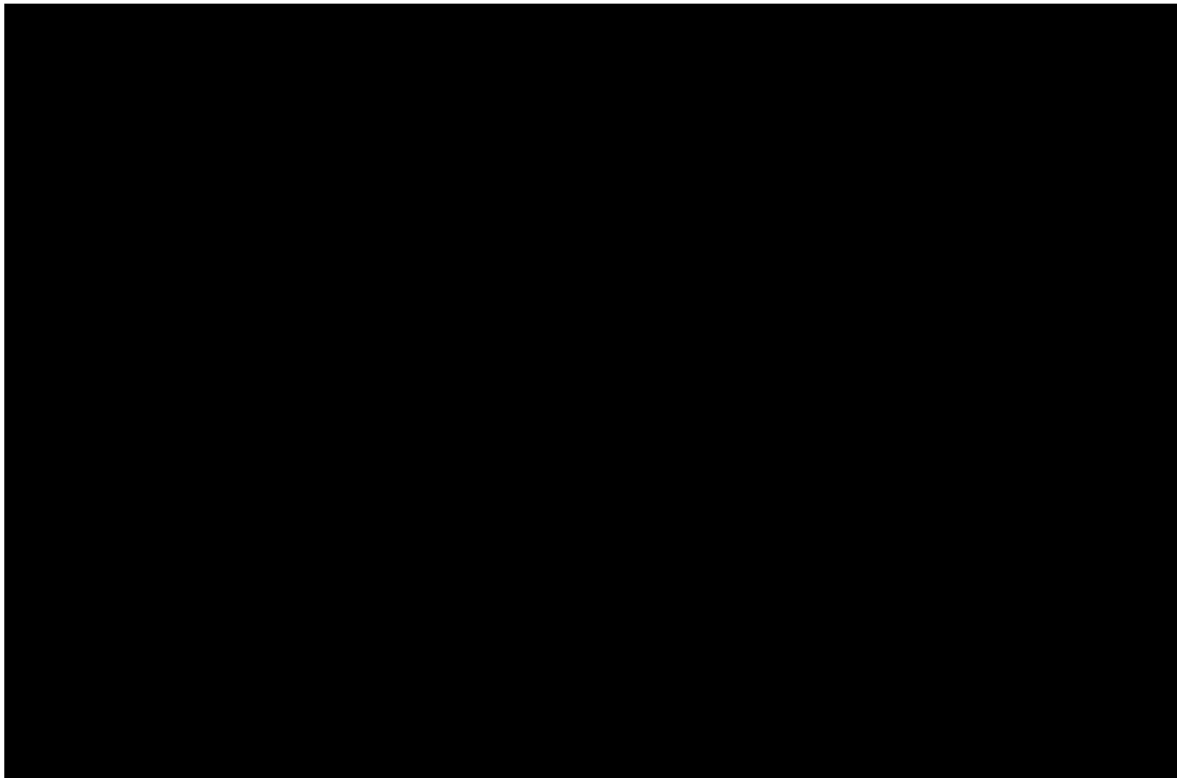


Figure A4. 23 Total Wholesale TI market shares, circuit counting method 2 (method 2 was used exclusively for counting TI circuits) ✕[REDACTED]

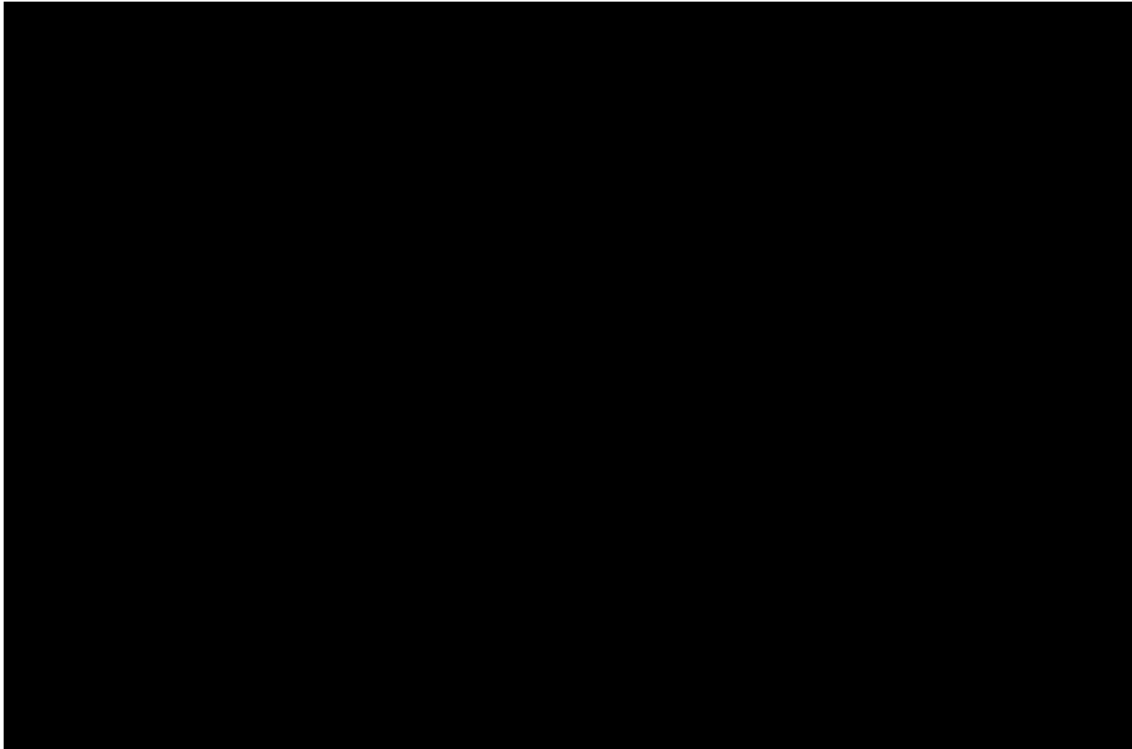


Figure A4. 24 Total Wholesale TI market shares absent regulation, circuit counting method 2 (method 2 was used exclusively for counting TI circuits) – Modified Greenfield Approach ✕[REDACTED]

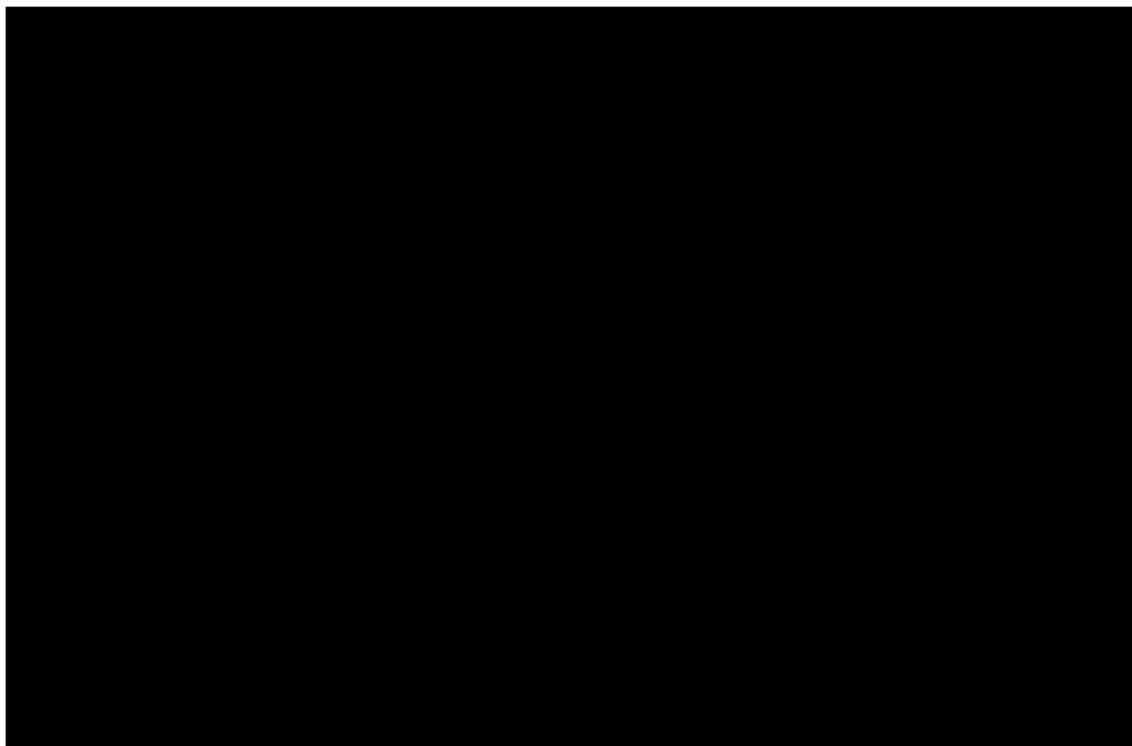


Figure A4. 25 Wholesale Low Bandwidth TI market shares ($\leq 2\text{Mb/s}$), circuit counting method 2 (used exclusively for counting TI circuits) ✂[REDACTED]

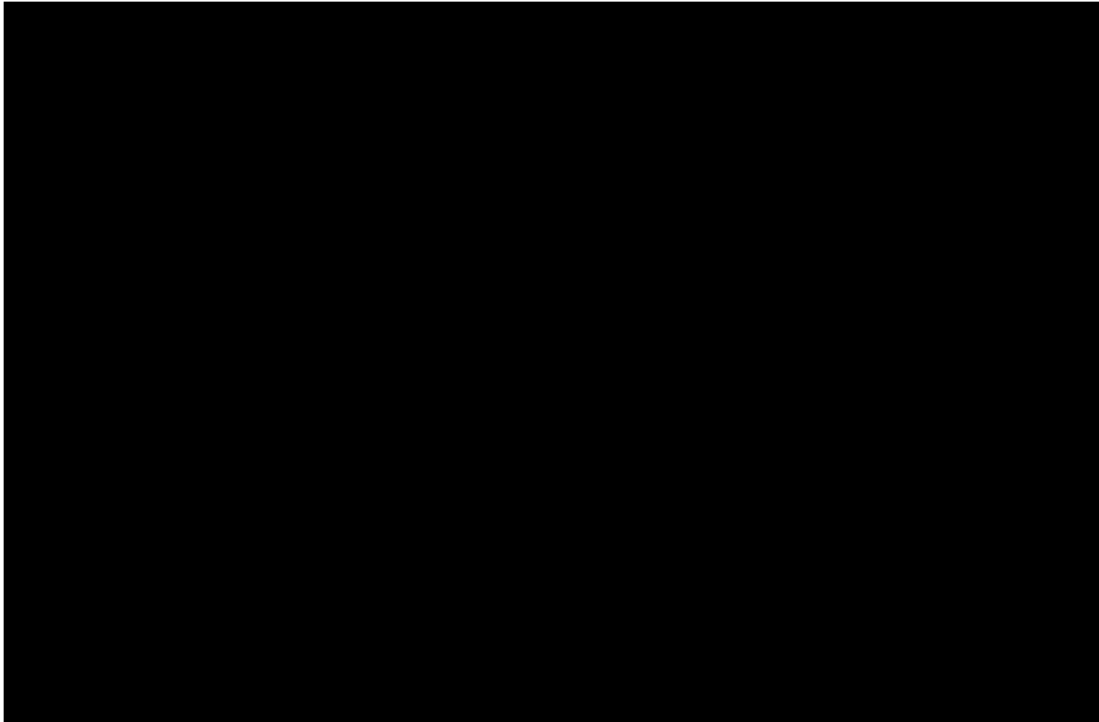


Figure A4. 26 Wholesale Low Bandwidth TI market shares ($\leq 2\text{Mb/s}$) Absent Regulation –Modified Greenfield method, circuit counting method 2 ✂[REDACTED]

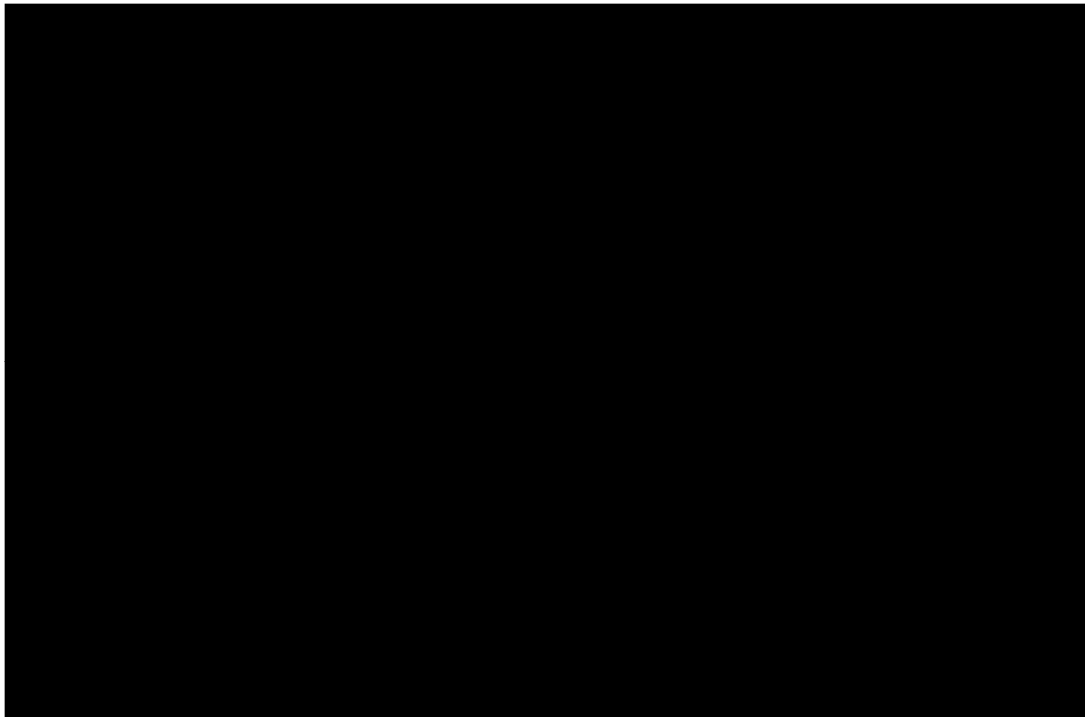


Figure A4. 27 Wholesale market shares of On-Net MI market, circuit counting method 1 ✕[REDACTED]

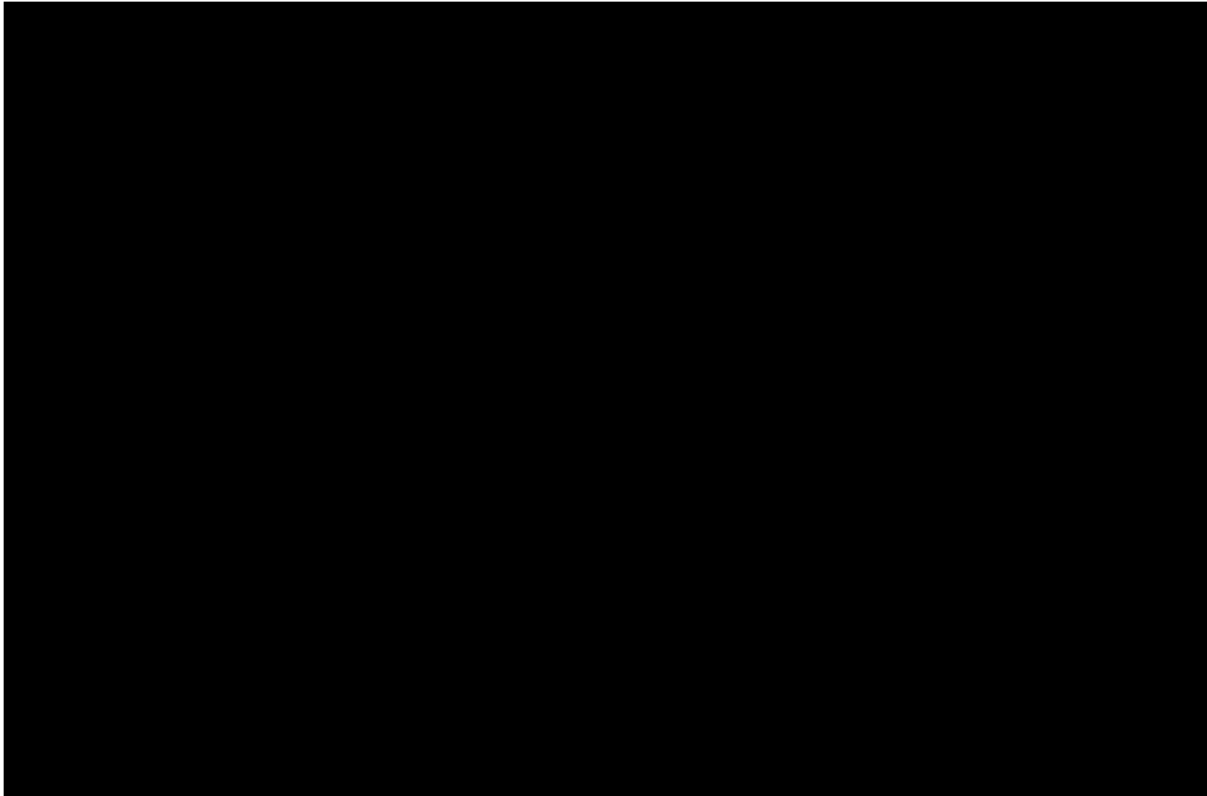


Figure A4. 28 Wholesale market shares of On-Net MI market, circuit counting method 2 ✕[REDACTED]

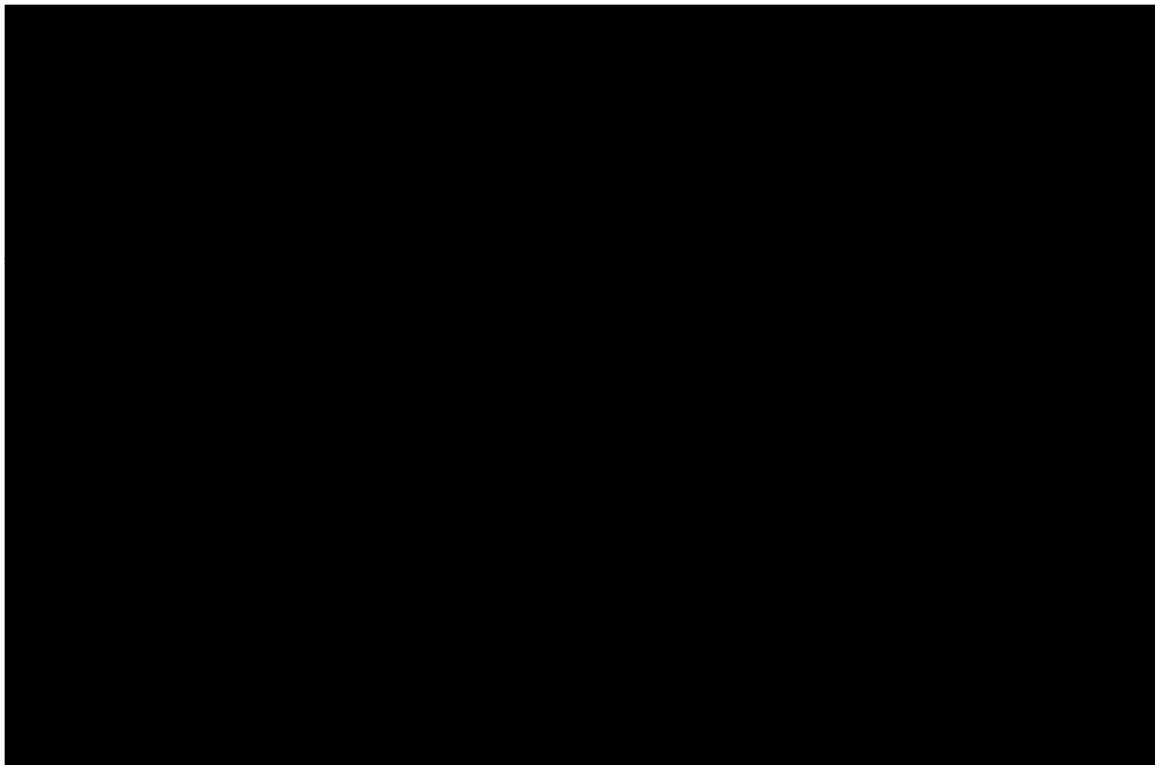


Figure A4. 29 Wholesale market shares of On-Net MI market, circuit counting method 3 ✕[REDACTED]

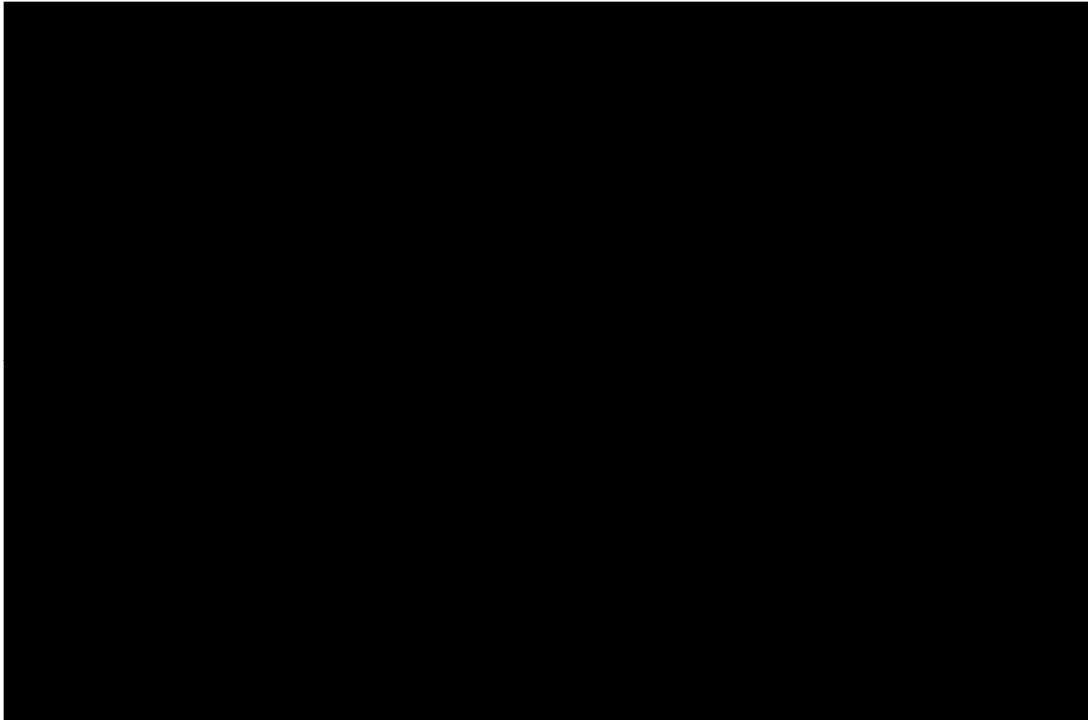


Figure A4. 30 Wholesale market shares of MI market absent regulation, circuit counting method 1 (Modified Greenfield Approach) ✕[REDACTED]

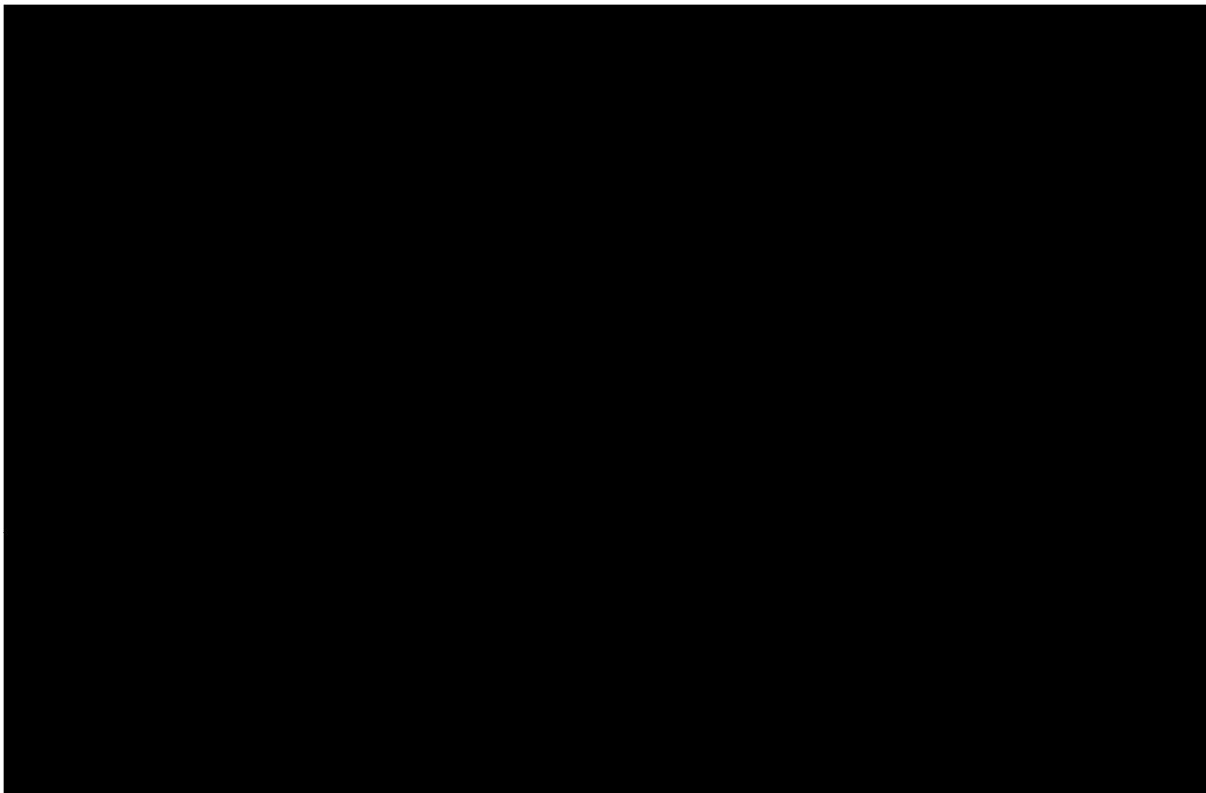


Figure A4. 31 Wholesale market shares of MI market absent regulation, circuit counting method 2 (Modified Greenfield Approach) ✕[REDACTED]

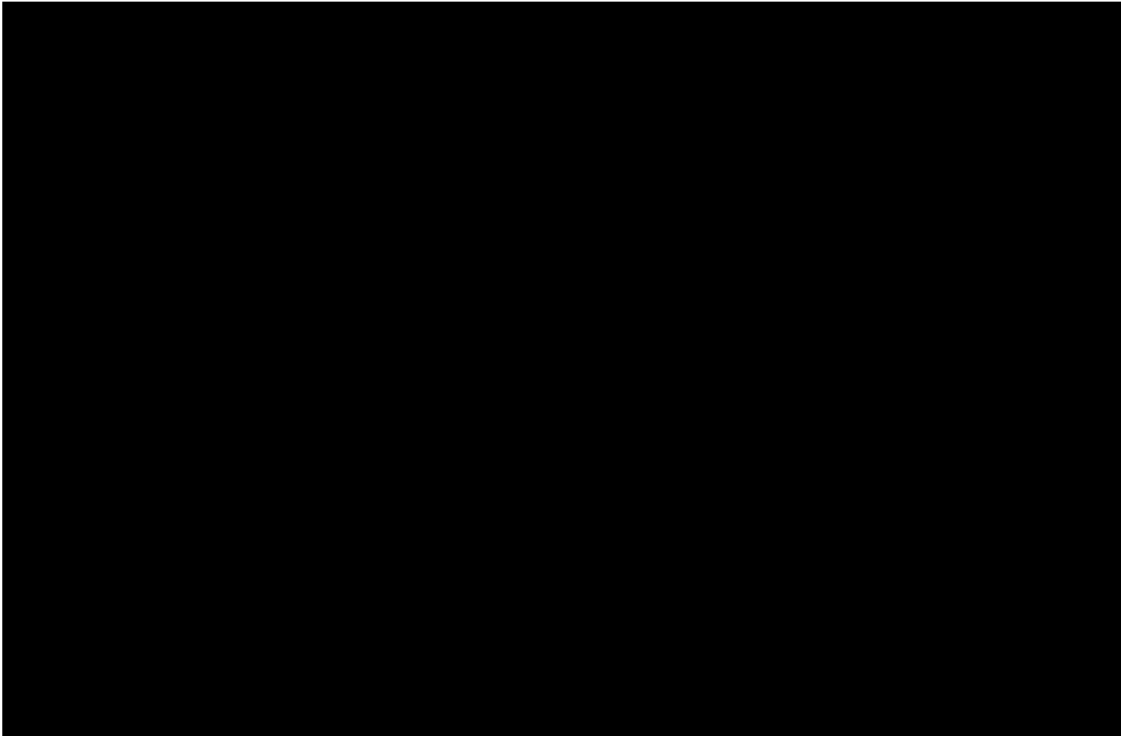


Figure A4. 32 Wholesale market shares of MI market absent regulation, circuit counting method 3 (Modified Greenfield Approach) ✕[REDACTED]

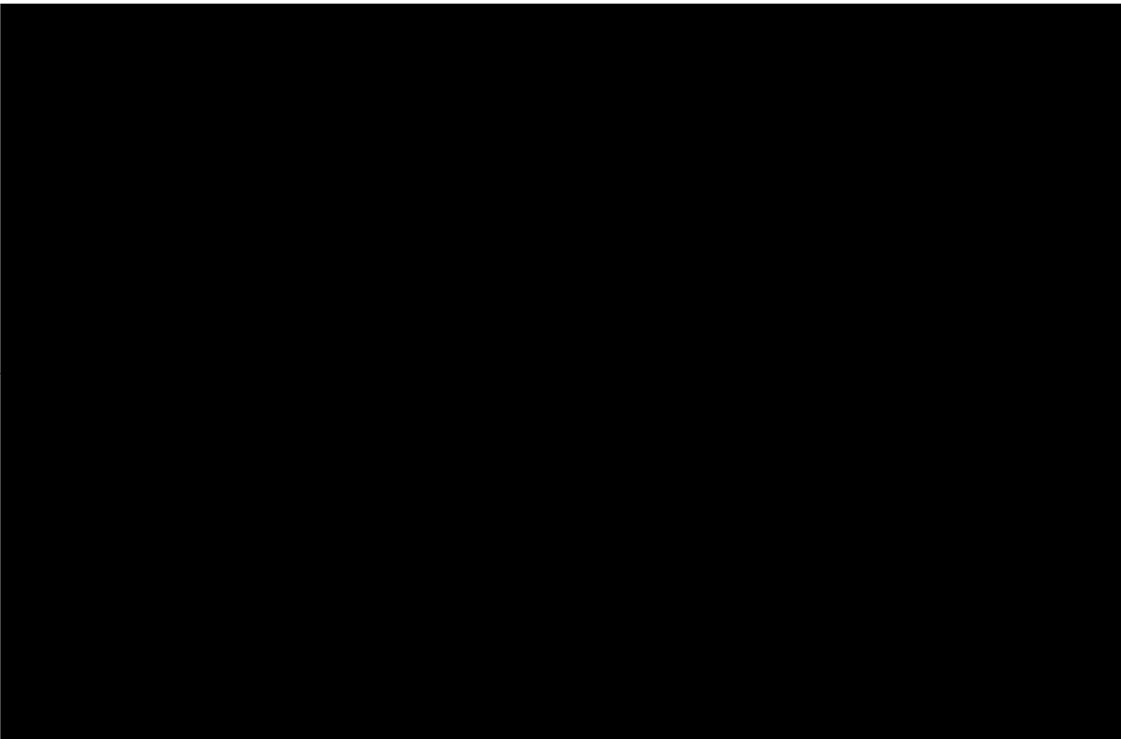


Figure A4. 33 Geographical market shares of Retail MI market 2014, inside and outside business parks, count method 3 &[REDACTED]

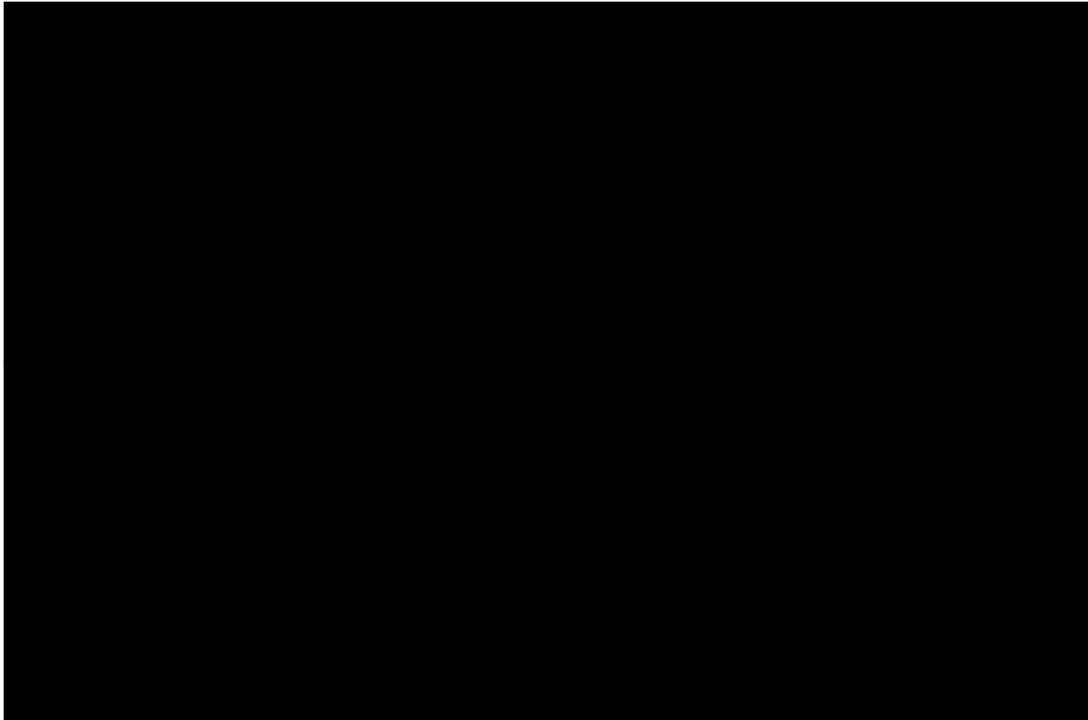
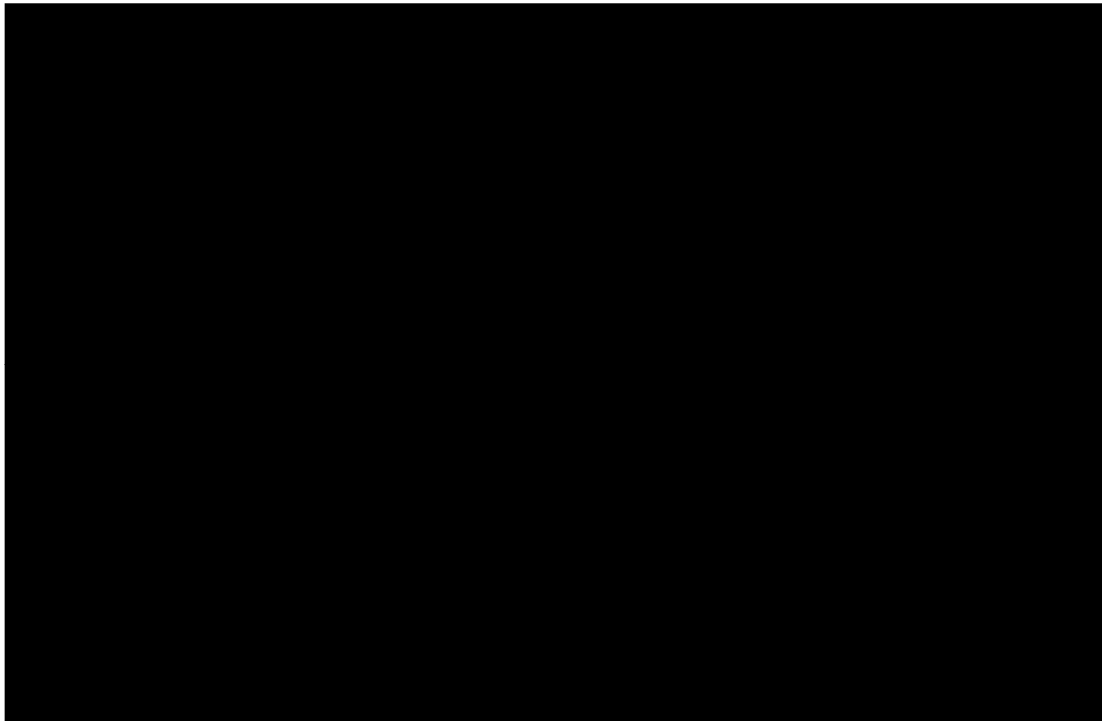
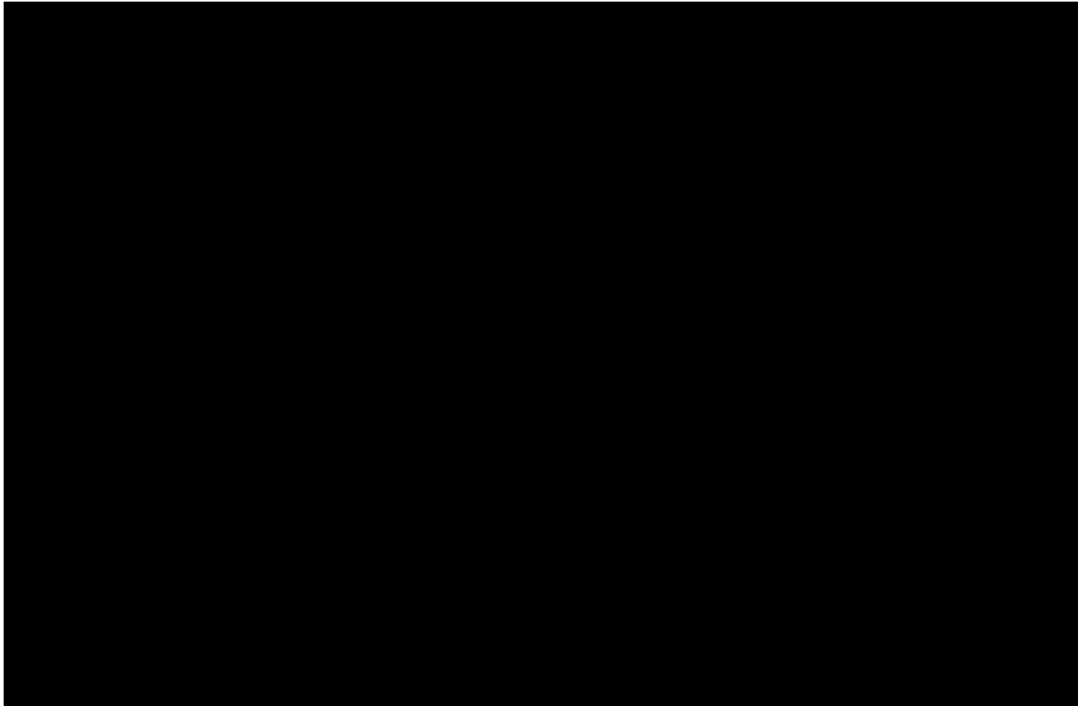


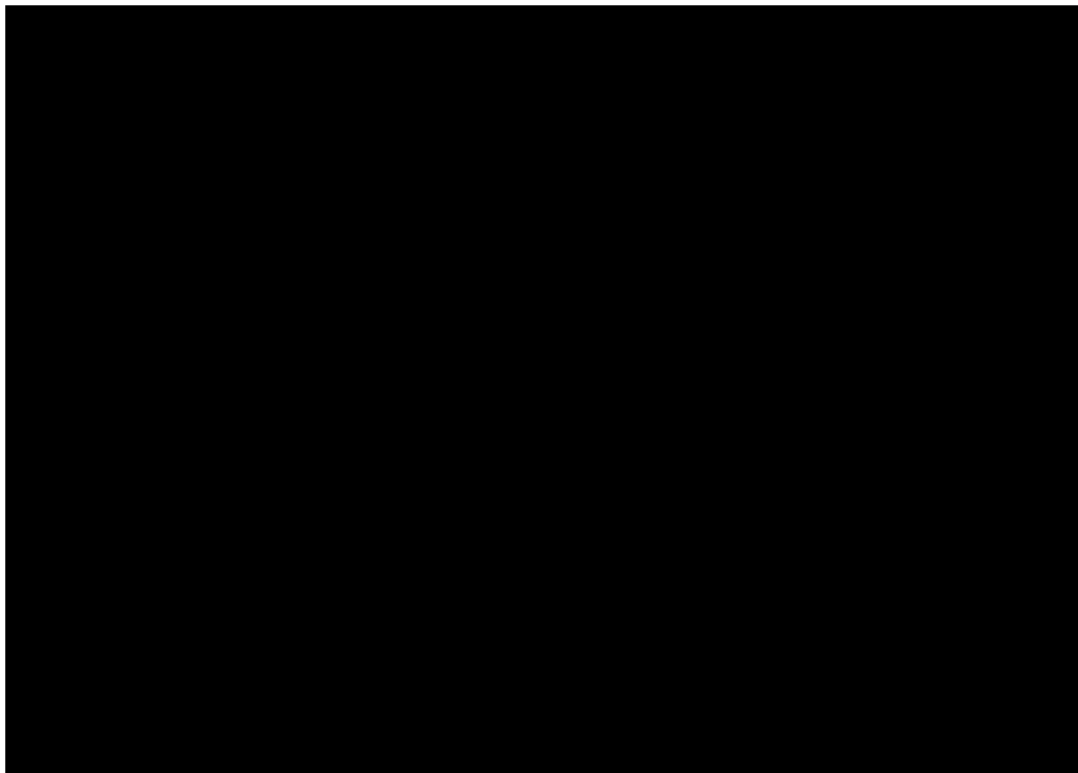
Figure A4. 34 Geographical market shares of MI WHQA market 2014, inside and outside business parks, count method 3 (Merchant market only) &[REDACTED]



**Figure A4. 35 Geographical market shares (MGF –Retail plus Wholesale) of MI market 2014, inside and outside Business Parks, circuit count method 3
✂[REDACTED]**



**Figure A4. 36 Reliance of SPs on Eircom to complete provisions in MI HQA markets 2014, inside and outside Business Parks, count method 3
✂[REDACTED]**



Appendix: 5 List of Business Parks

Figure A5.1: Business Parks.

No.	County	City/town	Business or Retail Park, 3rd level campus
1	Carlow	Carlow	Barrowside Business Park, Carlow
2	Carlow	Carlow	IT Carlow
3	Carlow	Carlow	Kernanstown Industrial Estate, Carlow
4	Carlow	Carlow	St. Patricks College Carlow
5	Carlow	Carlow	Strawhill Industrial Estate, Carlow
6	Cavan	Cavan	Centuary Business Park, Cavan
7	Cavan	Cavan	Kilgarry Industrial Park, Cavan
8	Cavan	Cavan	Loughtree Business Park, Cavan
9	Clare	Shannon Zone	Shannon Free Zone, Shannon Co.Clare
10	Cork	Cork	Ballycurreen Industrial Estate, Cork
11	Cork	Cork	Carraigaline Businss Park, Carraigaline, Cork
12	Cork	Cork	Carrigaline Industrial Estate, Carrigaline, Cork
13	Cork	Cork	City Gate Business Park, Cork
14	Cork	Cork	Cleve Business Park, Cork
15	Cork	Cork	Cork Institute of Technology
16	Cork	Cork	Eastgate Business Park, Cork
17	Cork	Cork	EMC Park, IDA, Industrial Estate, Cork
18	Cork	Cork	Euro Business Park, Little Island, Cork
19	Cork	Cork	Heritage Business Park, Mahon, Cork
20	Cork	Cork	Hollyhill Industrial Estate, Cork
21	Cork	Cork	IDA Business & Technology Park, Carrigtwohill, Cork
22	Cork	Cork	IDA Cork Business & Technology Park, Model Farm Road, Cork
23	Cork	Cork	Kilbarry Business Park, Cork
24	Cork	Cork	Kilnap Business & Technology Park, Cork
25	Cork	Cork	Little Island Industrial Estate, Cork
26	Cork	Cork	Longmahon Technology Park, Cork
27	Cork	Cork	Mahon Industrial Estate, Cork
28	Cork	Cork	Mahon Retail Park, Cork
29	Cork	Cork	Pooladuff Industrial Estate, Cork
30	Cork	Cork	Ringsaskiddy Industrial Area, Carrigaline, Cork
31	Cork	Cork	Riverview Business Park, Mahon, Cork
32	Cork	Cork	South Cork Industrial Estate, Cork
33	Cork	Cork	Technology Park, Ballincollig, Cork
34	Cork	Cork	The Square Retail Park, Ballincollig, Cork
35	Cork	Cork	Tivoli Inustrial Estate
36	Cork	Cork	UCC Cork
37	Cork	Cork	University Technology Centre, Curraheen Road, Cork
38	Cork	Cork	Waterfront Business Park, Little Island, Cork
39	Cork	Cork	Wilton Shopping Centre, Cork
40	Cork	Cork Airport	Cork Airport Campus, Cork
41	Donegal	Ballyshannon	Northwest Business Park, Ballyshannon
42	Donegal	Letterkenny	Ballyraine Industrial Estate
43	Donegal	Letterkenny	IDA Business Park
44	Donegal	Letterkenny	Letterkenny IT

45	Donegal	Letterkenny	Letterkenny Office Park
46	Donegal	Letterkenny	Pine Hill Industrial Estate
47	Dublin	Donabate	Redleaf (Roseville) Business Park, Donabate
48	Dublin	Donabate	Turvey Business Park, Donabate
49	Dublin	Dublin	Airside Retail & Business Park, Swords Co.Dublin
50	Dublin	Dublin	Airways Business Park D.9
51	Dublin	Dublin	Baldonnell Business Park, Naas Rd. Dublin
52	Dublin	Dublin	Ballymount Crosss Industrial Estate D.22
53	Dublin	Dublin	Blanchardstown Business & Technology Business Park D.15
54	Dublin	Dublin	Blanchardstown Corporate Park D.15
55	Dublin	Dublin	Blanchardstown IT D.15
56	Dublin	Dublin	Carrickmines, Business & Retail Park D.18
57	Dublin	Dublin	Central Park, Leopardstown, Dublin 18
58	Dublin	Dublin	Cherrywood Business Park D.18
59	Dublin	Dublin	CIT Cathal Bruagh St. D1
60	Dublin	Dublin	Citywest Business Park D.24
61	Dublin	Dublin	Clonshaugh/Willsborough Business Park D.17
62	Dublin	Dublin	Cookstown Industrial Estate, Tallaght D.24
63	Dublin	Dublin	Damastown Business Park D.15
64	Dublin	Dublin	DCU (Dublin City University) D.9
65	Dublin	Dublin	Deansgrange Business Park Co. Dublin
66	Dublin	Dublin	DIT Aungier St. D.2
67	Dublin	Dublin	DIT Bolton St. D1
68	Dublin	Dublin	DIT Camden Row D.8
69	Dublin	Dublin	DIT Kevin St. D.8
70	Dublin	Dublin	Docklands Innovation Park, East Wall Road, D.3
71	Dublin	Dublin	Dublin Inst of Advanced Studies, Burlington Rd D.4
72	Dublin	Dublin	Dublin Port D.1
73	Dublin	Dublin	Dun Laoghaire College of Art & Design Co.Dublin
74	Dublin	Dublin	East Point Business Park D.3
75	Dublin	Dublin	Grand Canal Docks (Grand Canal Square), D.2
76	Dublin	Dublin	Grangecastle Business Park Co. Dublin
77	Dublin	Dublin	IDA Ballycoollin Business Park D.15
78	Dublin	Dublin	IFSC D.1
79	Dublin	Dublin	IPA Landsdowne Rd. D4
80	Dublin	Dublin	IT Tallaght D.24
81	Dublin	Dublin	Kilcarberry Business Park D.22
82	Dublin	Dublin	Large Site, Eastern End Long Mile Road, D.12
83	Dublin	Dublin	M50 Business Park, Ballymount, D.22
84	Dublin	Dublin	Mater Dei Inst, Clonliffe Rd. D.3
85	Dublin	Dublin	Mountain View Business Park, Leopardstown, Dublin 18
86	Dublin	Dublin	NCAD (National College of Art & Design) Thomas St D.8
87	Dublin	Dublin	Northwest Business Park D.15
88	Dublin	Dublin	Northwood Business Park, Santry, D.9
89	Dublin	Dublin	Park West Business Park D.22
90	Dublin	Dublin	Parkway Business Centre D.22
91	Dublin	Dublin	Profile Park D.22
92	Dublin	Dublin	RCSI St.Stephens Green D.2
93	Dublin	Dublin	RIAM Westland Row, D.2
94	Dublin	Dublin	RTE campus, Donnybrook D.4
95	Dublin	Dublin	Sandyford Industrial Estate D.18

96	Dublin	Dublin	Southcounty Business Park, Leopardstown D.18
97	Dublin	Dublin	St Patricks Teachers Training College
98	Dublin	Dublin	Stillorgan Bus Park D.18
99	Dublin	Dublin	Swords Business Park Co. Dublin
100	Dublin	Dublin	TCD (Trinity College Dublin -University of Dublin) D.2
101	Dublin	Dublin	The Square, Tallaght, D.24
102	Dublin	Dublin	UCD Belfield D.4
103	Dublin	Dublin	Westgate Business Park, Ballymount D.24
104	Dublin	Dublin	Woodford Industrial Estate (at Airways In Est.) D.9
105	Galway	Athenry	Raheen Industrial Estate, Athenry
106	Galway	Ballinasloe	Ballinasloe Enterprise & Technology Centre
107	Galway	Galway	Ballybane Industrial Estate, Galway
108	Galway	Galway	Ballybrit Industrial Park, Galway
109	Galway	Galway	Bnarhill Business Park, Galway
110	Galway	Galway	Centre Point Business Park, Liosban, Galway
111	Galway	Galway	Cityeast Business Park, Ballybrit, Galway
112	Galway	Galway	Galway Business Park, Galway
113	Galway	Galway	Galway Financial Services Centre, Moneenageisha, Galway
114	Galway	Galway	Galway Technology Park, Galway
115	Galway	Galway	Galway/Mayo Institute of Technology, Dublin Rd, Galway
116	Galway	Galway	IDA Business Park, Dangan
117	Galway	Galway	Liosban Industrial Estate, Tuam Road, Galway
118	Galway	Galway	Mervue Industrial Estate, Galway
119	Galway	Galway	Oranmore Business Park, Galway
120	Galway	Galway	Parkmore Industrial Estate, Galway
121	Galway	Galway	UCG Campus Galway
122	Galway	Galway	Westlink Industrial Park, Galway
123	Galway	Galway	Westside Enterprise Park, Galway
124	Galway	Loughrea	IDA Loughrea Business and Technology Park
125	Galway	Oranmore	Deerpark Industrial Estate, Oranmore
126	Galway	Loughrea	East Point Business Park
127	Kerry	Killarney	Ballyspillane Industrial Estate
128	Kerry	Killarney	Woodland Industrial Estate
129	Kerry	Listowel	Cleiveragh Business Park, Listowel
130	Kerry	Tralee	Clash, Tralee business park,
131	Kerry	Tralee	IT Tralee
132	Kerry	Tralee	Monavalley Industrial Estate
133	Kildare	Leixlip	Colinstown Ind Pk Leixlip, Co.Kildare
134	Kildare	Leixlip	Liffey Park Technology Campus, Leixlip, Co.Kildare
135	Kildare	Leixlip	Ryebrook Business Park
136	Kilkenny	Kilkenny	Cillin Hill Retail & Business Park
137	Kilkenny	Kilkenny	Danville Business Park
138	Kilkenny	Kilkenny	Hebron Industrial Estate
139	Kilkenny	Kilkenny	Kilkenny Business & Technology Park
140	Kilkenny	Kilkenny	Kilkenny Industrial and Business Park
141	Kilkenny	Kilkenny	Ormonde Business Park
142	Laois	Portlaois	Clonminam Business Park
143	Laois	Portlaois	Kea-Lew Business Park
144	Laois	Portlaois	Lismard Business Park
145	Laois	Portlaoise	Portlaoise College
146	Limerick	Limerick	Annacotty Business Park, Limerick

147	Limerick	Limerick	City East Plaza Business Park, Ballysinon, Limerick
148	Limerick	Limerick	Cornacree Business park, Dock Road, Limerick
149	Limerick	Limerick	Crescent Shopping Center, Dooradoyle, Limerick
150	Limerick	Limerick	Glanvone Industrial Estate, Limerick
151	Limerick	Limerick	Limerick Enterprise Development Park, Roxboro, Limerick
152	Limerick	Limerick	Limerick IT
153	Limerick	Limerick	Mary Immaculate College, SCR, Limerick
154	Limerick	Limerick	Plassey, National Technology Park, Moylish, Limerick
155	Limerick	Limerick	Raheen Industrial Estate, Limerick
156	Limerick	Limerick	UL Limerick
157	Longford	Longford	Industrial & Business Park, Ballinallee, Longford
158	Longford	Longford	N4 Retail & Business Park, Longford
159	Longford	Longford	Townspark Industrial Estate, Longford
160	Louth	Drogheda	Donore Road Industrial Estate, Drogheda
161	Louth	Drogheda	Newgrange Business Park, Drogheda
162	Louth	Dundalk	Coes Road Industrial Estate, Dundalk
163	Louth	Dundalk	Dundalk IT
164	Louth	Dundalk	Finnabair Business Park, Dundalk
165	Louth	Dundalk	IDA Business Park, Dundalk
166	Louth	Dundalk	The Brewery Business Park, Dundalk
167	Louth	Dundalk	Xerox Business Park, Dundalk
168	Mayo	Claremorris	LakesideRetail/Business Park, Claremorris
169	Mayo	Claremorris	IDA Business Park, Claremorris
170	Meath	Dunboyne	Bracetown Business Park, Dunboyne
171	Meath	Dunboyne	Dunboyne Business Park, Dunboyne
172	Meath	Navan	Ballmoral Industrial estate
173	Meath	Navan	Beechmount Industrial estate
174	Meath	Navan	Mullagboy Industrial estate
175	Meath	Navan	Navan Business and Technology Park, Athlumney, Navan
176	Monaghan	Castleblaney	Killycard Industrial Estate, Monaghan
177	Monaghan	Monaghan	Milltown Business Park
178	Monaghan	Monaghan	Monaghan Institute
179	Offaly	Tullamore	Axis Business Park, Tullamore
180	Offaly	Tullamore	Central Business Park, Clonminch Road, Tullamore
181	Offaly	Tullamore	Srah IDA Business & Technology Park, Tullamore
182	Roscommon	roscommon	IDA Business & TEchnology Park, Roscommon
183	Sligo	Sligo	Finiskin Industrial Estate, Sligo
184	Sligo	Sligo	IT Sligo
185	Tipperary	Clonmel	Ard Gaoithe Business Park, Clonmel
186	Tipperary	Clonmel	Carrigeen Business Park, Clonmel
187	Tipperary	Clonmel	Cashel Road Industrial Estate, Clonmel
188	Tipperary	Clonmel	Gurtnafleur Business Park, Clonmel
189	Trim	Meath	Oaktree business park
190	Waterford	Dungarvan	Dungarvan Business Park, Dungarvan
191	Waterford	Dungarvan	IDA Industrial Estate, Dungarvan
192	Waterford	Dungarvan	Kilrush Business Park, Dungarvan
193	Waterford	Waterford	Cleaboy business park, Waterford
194	Waterford	Waterford	Industrial Estate, Cork Road, Waterford
195	Waterford	Waterford	Six crossroads business park, Waterford
196	Waterford	Waterford	Waterford business park, Waterford
197	Waterford	Waterford	Waterford IT

198	Westmeath	Athlone	Athlone Business & Technology Park, Garrycastle, Athlone
199	Westmeath	Athlone	Athlone Institute of Technology
200	Westmeath	Athlone	Blyry Industrial Estate, Athlone
201	Westmeath	Athlone	Cornamaddy Business Area, Athlone
202	Westmeath	Athlone	Monksland Business Park, Athlone (opp. Westpoint Bus Centre)
203	Westmeath	Athlone	Westpoint Business Park, Tuam Rd. Athlone
204	Westmeath	Mullingar	Lough Sheever Corporate Park
205	Westmeath	Mullingar	Mullingar Business Park, Mullingar
206	Wexford	Wexford	Ardcavan business park
207	Wexford	Wexford	Business and Technology park
208	Wexford	Wexford	Kerlogue business park
209	Wexford	Wexford	Whitemill Industrial estate

Appendix: 6 Tera Report on Data Treatment

A 6.1 The Tera Report on ComReg's treatment of data is available at ComReg Document 16/69c).

Appendix: 7 ComReg Response to Tera Report on Data Treatment

- A 7.1 Consultants Tera were commissioned to review ComReg's data gathering process, treatment of data and assumptions made to produce its initial national market share. Its report is published in Appendix: 6 of this Consultation. This was undertaken to test the robustness and validity of ComReg's approach and compare it to other suitable NRA projects. It inspected data sets supplied by sample operators, ComReg methodologies used in its treatment of this data and its calculation of simple market shares.
- A 7.2 It is important to note that this engagement was completed prior to any detailed geographic analysis having being undertaken by ComReg and was based on initial calculations of treating the markets on a national basis using 2013 and 2014 data. There were subsequent calculations completed with a varied approach taken treating the MI market on a geographical basis. This is explained in detail in Appendix 3 on Data Treatment.
- A 7.3 Methodologies adopted by NRAs Ofcom (UK) and ARCEP (France) were chosen by Tera on the basis that their analyses were relatively recent and were therefore, viewed by it as demonstrating a solid foundation for its approach to its review of ComReg's approach to its data treatment and analysis.
- A 7.4 ComReg notes that Ofcom conducted a consultation specifically on its methodologies and treatment of leased line data⁶⁰⁸ which it has gathered for its latest market review of leased lines. It had abandoned a previous attempt to gather data for this market due to the extreme difficulties encountered. ComReg has reviewed this consultation and notes that the data sought by Ofcom is similar to that requested by ComReg. ComReg further notes here the challenges Ofcom experienced in its data collating process was similar to that experienced by ComReg.
- A 7.5 The main issues raised by Tera which it considered merited further consideration are listed in the headings below together with ComReg's corresponding responses under each heading.

⁶⁰⁸http://stakeholders.ofcom.org.uk/binaries/consultations/bcmr-data-analysis/summary/BCMR_Data_Consultation.pdf.

Investigate any Divergence between Volume and Revenue Shares

- A 7.6 The Consultants noted that both Ofcom and ARCEP did not gather revenue information for their market analyses. Both data analyses were entirely predicated on circuit volume information.
- A 7.7 Tera noted that Ofcom defined a number of markets segmented by speeds and by technologies and therefore, the products within a market were less heterogeneous and pricing was probably less diverse. The Consultants suggested that ComReg should pay particular attention to and scrutinise any major divergences between market shares calculated by volume to those measured by revenue.
- A 7.8 ComReg considered both volume and revenues for market share analysis but noted that, where major discrepancies emerged (having regard to the difficulties faced by operators in reporting circuit revenue values), ComReg placed far greater weight on volumes of circuits for market share analysis. The project team decided to use circuit volumes to calculate market shares with revenue used as a sense check to identify outliers and for calculation of overall market value. This particularly applied to the geographic analysis undertaken subsequent to Tera's engagement.

Confirmation of the Counting Unit

- A 7.9 Tera noted that these other NRAs distinguished between "double-ended⁶⁰⁹" and "single-ended" leased lines and allocated a corresponding weight of 2 and 1 to each in their overall volume count.
- A 7.10 Double-ended lines are usually associated with specific types of leased lines: traditional end-to-end leased lines (very low in volume); specific products such as "National Leased" & "Private Line National" and very large capacity lines (1 Gb/s or greater) connecting 2 customer premises on a "point-to-point" basis. Whereas, a single-ended line connects a customer premises to an operator's network data services such as MPLS platform, the internet or alternately, to a point of interconnection or handover to another operator.
- A 7.11 ComReg did attempt to capture information in this format such that the Information Requests were designed to garner this information for each record entered on the relevant lists. However, in many instances such information was not supplied in sufficient detail by many Respondents in their initial responses.
- A 7.12 To assess this issue further, ComReg performed an analysis of the product types which were supplied by operators and concluded that the "double-ended" issue did not impact the data to a significant degree.

⁶⁰⁹ Also commonly referred to as "end-to-end" leased lines.

- A 7.13 There are a proportionately low number of customer services deployed using traditional end-to-end leased lines. The majority of leased lines, either Ethernet or TDM, are used to connect each customer premises to a data platform or service (MPLS, Internet Access etc.).
- A 7.14 One other exception to this for legacy services were analogue leased lines. Eircom is the only operator which provides this service directly on its own network. It does not offer an interconnection based version of this service at the wholesale level: its wholesale product is a resale version of its retail product. Furthermore, industry has never sought an interconnection based variant. The reasonable approach taken is to therefore treat these circuits as single counts in both wholesale and retail volumes. This was also the approach taken for all legacy TDM services.
- A 7.15 Similarly, the data demonstrated that, in the vast majority of cases of very high bandwidth fibre based services such as hi-speed Ethernet ($\geq 1\text{Gb/s}$), Wavelengths, FDDI etc., these tend to be provided on a point-to-point basis. Therefore, it is equitable to treat recorded instances of such services in the same manner for all operators as single instances. This also extends to where these services are provided in a “build me a network” scenario.
- A 7.16 Subsequent to this initial analysis, ComReg did conduct a further counts of circuits specifically for MI circuits. It used physical end addresses and other reasonable approaches to decipher whether or not customer premises were inside or outside these parks. This different approach was taken in an attempt to use the addresses for both ends for such circuits and this is described in detail in Appendix: 3 of this Consultation on Data Treatment.

Trends analysis

- A 7.17 In order to ameliorate the absence of reliable trend data for the time period 2009 to 2012 (referred to in detail in the Appendix on Data Treatment), the Consultants suggested that ComReg request further data from operators on their sales bid conversion rates in bids over this period and up to 2104. The logic for this was that it may help demonstrate the competitiveness for leased line services overtime.
- A 7.18 It should be noted that, for trends analysis, Ofcom and ARECP used two data points in time i.e. their most recent data period and the data used in their previous market reviews.
- A 7.19 ComReg’s detailed trends data analysis inspected by Tera, was based upon a comparison of its data from its previous market review in 2008 and the data it has collected for the periods 2013 and 2014. The 2015 was included at a later date as it was not available when Tera undertook its review.
- A 7.20 ComReg has also performed an aged profile of some of the SPs’ leased lines where the installation data has been provided. This clearly demonstrates that the vast majority of new lines provided in 2013 and 2014 (later supported by 2015 data) were Ethernet or other Modern Interface lines.
- A 7.21 ComReg also included questions on sales bid conversion rates in its Qualitative Questionnaire issued on in May 2015 as recommended by Tera.

- A 7.22 ComReg also noted that the 2009 – 2012 data although unreliable for the use of calculating market shares, confirmed trends such as the general migration from TDM to Ethernet and other Modern Interface leased lines in both wholesale and retail markets.
- A 7.23 In addition, ComReg leveraged other data sources including leased lines data gathered under statutory powers for ComReg's Quarterly Report and spectrum licensing data which clearly demonstrated the increased use of point to point wireless links by SPs active in the HQA markets. Numerous engagements were also conducted with various SPs and with some major consumers of leased lines including some central and local government agencies and HEAnet. This was in addition to the 2014 Market Research undertaken, the results of which are published in Appendix: 2 of this Consultation.

Geographic Information

- A 7.24 The Consultants noted the lack of specific geographic location information by customer connections and compared this to other jurisdictions which have used postal codes for many years to aid the delivery of telecoms services.
- A 7.25 Postcodes would help such geographic analysis but was not expected to be introduced in Ireland until 2016 at least at that time. At the time of publication of this Consultation, operators still do not have firm plans for the widespread use of postal codes in the deployment of services though there has been some industry discussion on their possible use with deployment of some Eircom NGA FTTH services.
- A 7.26 It was ComReg's intention to gather detailed location information (XY coordinates) relating to customer premises. However, as noted in the Appendix on Data Treatment this approach was not taken due to Respondents inability to provide such information.
- A 7.27 The Consultants suggested that ComReg compare business location information to the aggregate network mapping information which ComReg gathered from operators.
- A 7.28 This was proposed in order to bolster the presumption that the networks follow business opportunities. It was also suggested that ComReg research a breakdown of companies which use leased lines by size (number of employees).
- A 7.29 In response to the Consultant's suggestion, ComReg decided to undertake an exercise to map the location of all businesses by employee number and compare these to network maps obtained from operators. ComReg purchased business location information for over sixteen thousand business and plotted these on a map of consolidated of operator networks. This confirmed ComReg's belief that alternative SPs have built out their networks to areas of high concentration of businesses.

A 7.30 ComReg also reverted to many SPs requesting more adequate addressing information to that provided in initial responses of the 2014 data. This allowed ComReg and its consultants Oxera, to perform separate detailed geographic analysis of the 2014 data. For this purpose, double-ended lines were split into their separate physical ends and each was counted individually. The lines were then counted as to whether or not they were inside or outside a set of 209 competitive business parks and geographic markets share were calculated on this basis as detailed in Appendix: 3 and in the Oxera Report at Appendix: 1.

ComReg Comments on Tera Report

A 7.31 ComReg is of the view that the data it has compiled and the methodologies that were adopted in the first treatment of the 2013 and 2014 data (including assumptions made) are sufficiently robust for the purposes of conducting this market analysis. This view is supported by the Tera report.

A 7.32 This view is taken having regard to the experience of other NRAs, a review of its data gathering and treatment, the review by Tera Consultants.

A 7.33 ComReg has expended significant time and resources to this process and has engaged significantly with operators to gather the best information possible from them.

A 7.34 ComReg has also conducted this market analysis using additional information sources other than data gathered directly from operators. ComReg also undertook a retail business survey on leased lines and business broadband; it met with numerous operators and a number of major retail consumers of leased lines, other NRAs who have completed their analyses; used publicly available marketing information and announcements; Eircom's regulated accounts and published regulatory information; ComReg's Spectrum Division microwave wireless licencing information and ComReg Quarterly Reports.

A 7.35 Many operators have stated to ComReg that, in their view, the Information Requests were very detailed and in some cases difficult to respond to fully. Therefore, ComReg is satisfied that it has gathered all information it could reasonably rely upon in conducting this market analysis and its approaches to the treatment of this data has been reasonable, fair and reliable and that this exercise has yielded fit for purpose data sets.

Appendix: 8 Draft Decision Instrument

1 STATUTORY POWERS GIVING RISE TO THIS DECISION INSTRUMENT

1.1 This Decision Instrument (“Decision Instrument”) is made by the Commission for Communications Regulation (“ComReg”) and relates to the market(s) for wholesale high quality access provided at a fixed location as identified by the European Commission in the 2014 Recommendation and analysed by ComReg in ComReg Document No. 16/69 and ComReg Document No. [17/XX], ComReg Decision DXX/17 [Decision Document].

1.2 This Decision Instrument is made:

- (i) Pursuant to and having had regard to Sections 10 and 12 of the Communications Regulation Act 2002 (as amended);
- (ii) Pursuant to and having had regard to Regulation 6(1) of the Access Regulations and Regulation 16 of the Framework Regulations;
- (iii) Having taken the utmost account of the 2014 Recommendation, the Explanatory Note and the SMP Guidelines;
- (iv) Having, pursuant to Section 13 of the Communications Regulation Act 2002 (as amended), where applicable, complied with Ministerial Policy Directions;
- (v) Having had regard to the analysis and reasoning set out in ComReg Document No. 16/69 and having taken account of the submissions received from interested parties in response thereto following a public consultation pursuant to Regulation 12 of the Framework Regulations;
- (vi) Having consulted with the Competition and Consumer Protection Commission pursuant to Regulation 27 of the Framework Regulations;
- (vii) Having notified the draft measure and the reasoning on which the measure is based to the European Commission, BEREC and the national regulatory authorities in other EU Member States pursuant to Regulations 13 and 14 of the Framework Regulations and having taken utmost account of any comments made by these parties;
- (viii) Pursuant to Regulations 25, 26 and 27 of the Framework Regulations and Regulations 8, 9, 10, 11, 12, and 13 of the Access Regulations; and
- (ix) Having regard to the analysis and reasoning set out in ComReg Document No. [17/XX], ComReg Decision DXX/17 [Decision Document].

- 1.3 The provisions of ComReg Document No. 16/69 and ComReg Document No. [17/XX], ComReg Decision DXX/17 [Decision Document] shall, where appropriate, be construed consistently with this Decision Instrument.
- 1.4 To the extent that there is any conflict between a decision instrument dated prior to the Effective Date and this Decision Instrument, this Decision Instrument shall prevail.

PART I - GENERAL PROVISIONS (SECTIONS 2 TO 5 OF THE DECISION INSTRUMENT)

2 DEFINITIONS

- 2.1 In this Decision Instrument, unless the context otherwise suggests:

“Access” shall have the same meaning as under Regulation 2 of the Access Regulations, as may be amended from time to time;

“Access Regulations” means the European Communities (Electronic Communications Networks and Services) (Access) Regulations 2011 (S.I. No. 334 of 2011), as may be amended from time to time;

“Access Seeker” means an undertaking (or other authorised operator) that purchases, or could potentially purchase, WHQA Services;

“Analogue Leased Line” means a leased line with an analogue (2 or 4 wire) interface;

“Associated Facilities” shall have the same meaning as under Regulation 2 of the Framework Regulations, as may be amended from time to time;

“BEREC” means the Body of European Regulators for Electronic Communications, as established pursuant to Regulation (EC) No. 1211/2009 of the European Parliament and of the Council of 25 November 2009;

“Bottom Up Long Run Average Incremental Cost plus” or **“BU-LRAIC+”** means the methodology used to estimate the “LRAIC plus” of an efficient operator which is derived from an economic and/or engineering model of an efficient network. The LRAIC plus costs are the average efficiently incurred directly attributable variable and fixed costs, including an appropriate apportionment of joint and common costs;

“Channelised E1 (2MB) Access” means the Eircom wholesale service which combines multiple sub 2Mb/s circuits onto a single 2Mb/s circuit;

“Communications Regulation Act 2002 (as amended)” means the Communications Regulation Act 2002 (No. 20 of 2002), as amended;

“ComReg” means the Commission for Communications Regulation, established under Section 6 of the Communications Regulation Act 2002 (as amended);

“ComReg Decision D07/61” means ComReg Document No. 07/61 entitled “Decision Notice and Decision Instrument - Designation of SMP and SMP Obligations, Market Analysis: Retail Fixed Narrowband Access Markets”, dated 24 August 2007;

“ComReg Decision D06/08” means ComReg Document No. 08/103 entitled “Market Analysis – Leased Line Market Review: Response to Consultation on Draft Decision Instrument Final Decision Notice and Decision Instrument”, dated 22 December 2008;

“ComReg Decision D03/09” means ComReg Document No. 09/65 entitled “Response to Consultation Document and Final Decision – Response to Consultation Document No. 09/11: Review of the regulatory asset lives of Eircom Limited”, dated 11 August 2009;

“ComReg Decision D02/10” means ComReg Document No. 10/12 entitled “Lease Lines Markets: Review of Urban Centres – Response to Consultation 09/86 and Final Decision”, dated 15 February 2010;

“ComReg Decision D08/10” means ComReg Document No. 10/67 entitled “Response to Consultation Document and Final Direction and Decision, Response to Consultation Document No. 09/75 and Final Direction and Decision: Accounting Separation and Cost Accounting Review of Eircom Limited”, dated 31 August 2010;

“ComReg Decision D02/11” means ComReg Document No. 11/22 entitled “Response to Consultation and Final Decision – Amendments to the transparency obligation and the access obligation in the market for wholesale terminating segments of leased lines”, dated 22 March 2011;

“ComReg Decision D05/11” means ComReg Document No. 11/45 entitled “Response to Consultation and Decision on the Introduction of Key Performance Indicators for Regulated Markets”, dated 29 June 2011;

“ComReg Decision D02/12” means ComReg Document No. 12/03 entitled “Response to Consultation Document No. 10/70 and 11/32 – A final decision further specifying the price control obligation in the market for wholesale terminating segments of leased lines”, dated 2 February 2012;

“ComReg Decision D12/13” means ComReg Document No. 13/75 entitled “Leased Line Markets: Further review of Urban Centres – Final Decision and Response to Consultation”, dated 29 July 2013;

“ComReg Document No. 05/24” means ComReg Document No. 05/24 entitled “Response to Consultation, Guidelines on the treatment of confidential information, Final text of Guidelines”, dated 22 March 2005;

“Co-Location” shall have the same meaning and description as under Part B “Co-location services” of the Schedule to the Access Regulations (as may be amended from time to time);

“Competition and Consumer Protection Commission” formerly the Competition Authority and the National Consumer Agency;

“Connection Charge(s)” means a charge associated with a connection to, disconnection from, upgrade, downgrade, migration or removal of an existing service or a similar one-off charge as set out in Eircom’s Network Price List (version v6_9 as may be amended from time to time);

“Customer-Sited Handover” or **“CSH”** means that Eircom provides the transmission path from the Eircom Exchange or node to the Access Seeker’s premises, without the requirement for the Access Seeker to extend its network;

“Digital Leased Line” or **“DLL”**, also known as **“Wholesale Leased Line”** or **“WLL”**, means a wholesale end to end TDM;

“Effective Date” means the date set out in Section 17 of this Decision Instrument;

“Eircom” means Eircom Limited, and its subsidiaries and any related companies, and any Undertaking which it owns or controls, and any Undertaking which owns or controls Eircom Limited, and its successors and assigns. For the purpose of this Decision Instrument, the terms “subsidiary” and “related company” shall have the meaning ascribed to them in the Companies Act 2014 (as may be amended from time to time);

“Electronic Communications Network(s)” or **“ECN(s)”** shall have the same meaning as under Regulation 2 of the Framework Regulations, as may be amended from time to time;

“Electronic Communications Service(s)” or **“ECS”** shall have the same meaning as under Regulation 2 of the Framework Regulations, as may be amended from time to time;

“End User” shall have the same meaning as under Regulation 2 of the Framework Regulations, as may be amended from time to time. For the avoidance of doubt, End User(s) shall be deemed to include any natural or legal person who facilitates or intends to facilitate the provision of public communications networks or publicly available electronic communications services to other End Users and who is not acting as an Undertaking;

“End User Link” or **“EUL”** means an End User Link as defined in Eircom’s PPC Product Description;

“Equivalence of Outputs” means the provision of products, services, facilities, and information by the SMP Undertaking to OAOs such that such products, services, facilities, and information are provided to OAOs in a manner which achieves the same standards in terms of functionality, price, terms and conditions, service and quality levels as the SMP Undertaking provides to itself, albeit potentially using different systems and processes;

“(the) Explanatory Note” means the Commission Staff Working Document: Explanatory Note accompanying the 2014 Recommendation (9 October 2014, SWD (2014) 298;

“Framework Regulations” means the European Communities (Electronic Communications Networks and Services) (Framework) Regulations 2011 (S.I. No. 333 of 2011), as may be amended from time to time;

“High Bandwidth TI WHQA” or **“High Bandwidth Traditional Interface Wholesale High Quality Access”** has the meaning given to it in Section 5 of ComReg Document No. 16/69;

“In-Span Handover” or **“ISH”** means the connection between the Eircom Exchange or node and the Access Seeker’s nominated Point of Handover. In this instance the Access Seeker extends its network to a point close to the Eircom node (this can be in an underground chamber for example);

“Interconnection” shall have the same meaning as under Regulation 2 of the Access Regulations, as may be amended from time to time;

“Interconnection Service(s)” includes CSH, ISH, and TLs;

“Key Performance Indicator(s)” or **“KPI(s)”** means a measure(s) of the standard(s) of product, service or facility provided by Eircom to Undertakings and by Eircom to itself;

“Leased Lines Reference Offer” or **“LLRO”** is the latest version of the offer of contract by Eircom to OAOs in relation to wholesale leased lines (but which may from time to time be amended). For the avoidance of doubt the LLRO includes the documents which are expressly referred to in the LLRO as being part of the LLRO. To the extent that there is any conflict between the LLRO and Eircom’s obligations now set out herein, it is the latter which shall prevail;

“LLRO Change Matrix” means the table of information collated by Eircom which specifies the non-price related amendments made to its LLRO, including the date(s) on which such amendments come into effect;

“LLRO Price List Change Matrix” means the table of information collated by Eircom which specifies the amendments made to the LLRO Price List(s) which are contained in its LLRO, including the date(s) on which such amendments come into effect;

“LLRO Price List(s)” means the list of charges collated by Eircom for products, services and facilities which are to be provided and specified in its LLRO in accordance with the requirements of this Decision Instrument;

“Long Run Average Incremental Cost plus” or **“LRAIC+”** means the average efficiently incurred directly attributable variable and fixed costs, plus an appropriate apportionment of joint and common costs;

“Low Bandwidth TI WHQA” or **“Low Bandwidth Traditional Interface Wholesale High Quality Access”** has the meaning given to it in Section 5 of ComReg Document No. 16/69;

“MI WHQA” or **“Modern Interface Wholesale High Quality Access”** has the meaning given to it in Section 5 of ComReg Document No. 16/69;

“Ministerial Policy Directions” for the purposes of this Decision Instrument means the policy directions made by Dermot Ahern TD, then Minister for Communications, Marine and Natural Resources, dated 21 February 2003 and 26 March 2004;

“OSS” means operational support systems;

“Other Authorised Operator(s)” or **“OAO(s)”** means an Undertaking that is not Eircom, providing or intending to provide an ECN or an ECS pursuant to Regulation 4 of the Authorisation Regulations;

“Performance Metric(s)” means the measure of performance levels to be achieved by Eircom within a specified period, as calculated in accordance with the methodology and service parameter definitions set out in its Service Level Agreements;

“PPC” means Private Partial Circuit as defined in Eircom’s product description;

“(the) Relevant Markets” means the markets described in Section 4 of this Decision Instrument;

“Service Credit(s)” means a financial credit which is provided by Eircom to an OAO where Eircom has failed to meet the service levels which Eircom commits to from time to time in its SLA;

“Service Level Agreement(s)” or **“SLA(s)”** mean legally binding contracts between Eircom and OAOs in relation to the service levels which Eircom commits to from time to time, as more particularly set out in the LLRO. For the avoidance of doubt, however, to the extent that there is any conflict between the SLAs and Eircom’s obligations set out in this Decision Instrument, it is the latter which shall prevail;

“Significant Market Power obligation(s)” or **“SMP obligation(s)”** are those obligations as more particularly described in Part II below, as may be amended from time to time;

“SLA Negotiation Period” means the number of working days, as determined by Eircom, required to conclude negotiations between it and an Undertaking in respect of a request from the Undertaking for a new SLA or an amendment to an existing SLA. For the avoidance of doubt, the SLA Negotiation Period relates only to the conclusion of negotiations in respect of the SLA;

“(the) SMP Guidelines” means the European Commission guidelines of 11 July 2002 on market analysis and the assessment of significant market power under the Community regulatory framework for electronic communications networks and services (2002/C165/03) (OJ C 165, 11.7.2002, p.6);

“Significant Market Power Undertaking” or **“SMP Undertaking”** means the Undertaking designated in Section 5 of this Decision Instrument as having Significant Market Power;

“TDM” means Time Division Multiplexed;

“Transport Link” means a TDM based interconnection service used to deliver EULs as defined in Eircom’s product description;

“Undertaking(s)” shall have the same meaning as under Regulation 2 of the Framework Regulations, as may be amended from time to time;

“Wholesale Leased Line” or **“WLL”**, also known as **“Digital Leased Line”** or **“DLL”**, means a wholesale end to end TDM leased line;

“(the) 2014 Recommendation” means the European Commission Recommendation of 9 October 2014 on relevant product and service markets within the electronic communications sector susceptible to ex ante regulation in accordance with Directive 2002/21/EC of the European Parliament and of the Council on a common regulatory framework for electronic communications networks and services (OJ L 295, 11.10.2014, p. 79).

3 SCOPE AND APPLICATION

- 3.1 This Decision Instrument is binding upon Eircom and Eircom shall comply with it in all respects.
- 3.2 This Decision Instrument applies to Eircom in respect of activities falling within the scope of the Relevant Market defined in Section 4 of this Decision Instrument.

4 MARKET DEFINITION

- 4.1 This Decision Instrument relates to the wholesale market(s) for high quality access provided at a fixed location as identified by the European Commission in the 2014 Recommendation and analysed by ComReg in this Decision [DXX/17]. For the purposes of this Decision Instrument, ComReg identifies three separate markets as more particularly defined in Section 4.2 below (referred to in this Decision Instrument singularly as the Relevant Market and together as the Relevant Markets).
- 4.2 Pursuant to Regulation 26 of the Framework Regulations and in accordance with the 2014 Recommendation, the Explanatory Note and taking the utmost account of the SMP Guidelines, in accordance with the principles of competition law, the Relevant Markets defined in this Decision Instrument are:
- (i) the Low Bandwidth Traditional Interface Wholesale High Quality Access Market (“the Low Bandwidth TI WHQA Market”);
 - (ii) the High Bandwidth Traditional Interface Wholesale High Quality Access Market (“the High Bandwidth TI WHQA Market”); and
 - (iii) the Modern Interface Wholesale High Quality Access Market (“the MI WHQA Market”).

- 4.2.1 Pursuant to Regulation 26 of the Framework Regulations, and taking utmost account of the European Commission's SMP Guidelines, the relevant geographic market is defined as Ireland.

5 MARKET ASSESSMENT AND SIGNIFICANT MARKET POWER ("SMP")

- 5.1 Pursuant to Regulation 25 and Regulation 27 of the Framework Regulations and taking the utmost account of the SMP Guidelines, having determined that the Relevant Low Bandwidth TI WHQA Market is not effectively competitive, Eircom is designated as having SMP in the Low Bandwidth TI WHQA Market.
- 5.2 Pursuant to Regulation 25 and Regulation 27 of the Framework Regulations and taking the utmost account of the SMP Guidelines, having determined that the Relevant High Bandwidth TI WHQA Market is effectively competitive, no operator is designated as having SMP in the High Bandwidth TI WHQA Market.
- 5.3 Pursuant to Regulation 25 and Regulation 27 of the Framework Regulations and taking the utmost account of the SMP Guidelines, having determined that the Relevant MI WHQA Market is effectively competitive, no operator is designated as having SMP in the MI WHQA Market.

PART II - SMP OBLIGATIONS (SECTIONS 6 TO 12 OF THE DECISION INSTRUMENT) IN RELATION TO LOW BANDWIDTH TRADITIONAL INTERFACE WHOLESALE HIGH QUALITY ACCESS

6 SMP OBLIGATIONS IN RELATION TO LOW BANDWIDTH TI WHOLESALE HIGH QUALITY ACCESS PRODUCTS, SERVICES AND FACILITIES

- 6.1 ComReg is imposing certain SMP obligations on Eircom in accordance with and pursuant to Regulations 8, 9, 10, 11, 12 and 13 of the Access Regulations, as detailed further in Sections 7 to 12 below in respect of the Low Bandwidth TI Wholesale High Quality Access Market, excluding Analogue Leased Lines, Digital Leased Lines (also known as Wholesale Leased Lines) and Channelised E1 (2MB) access.

7 OBLIGATIONS TO PROVIDE ACCESS

- 7.1 Pursuant to Regulation 12(1) of the Access Regulations, Eircom shall meet all reasonable requests from Undertakings for the provision of Access to Low Bandwidth TI Wholesale High Quality Access including Associated Facilities.
- 7.2 Without prejudice to the generality of Section 7.1 of this Decision Instrument and pursuant to Regulation 12(2) of the Access Regulations, Eircom shall provide and grant Access to Undertakings for the following particular products, services and Associated Facilities:-

Partial Private Circuit leased lines, consisting of:

- a. End User Links of bandwidths 64kb/s up to and including bandwidths of 2Mb/s; and
 - b. Interconnection Services, in particular Transport Links, including In-Span Handover and Customer Sited Handover variants.
- 7.3 Without prejudice to the generality of Sections 7.1 and 7.2 of this Decision Instrument, Eircom shall offer and continue to offer and provide Access to the products, services and facilities referred to in Sections 7 and 8 of this Decision Instrument in accordance with the product descriptions and terms and conditions of supply or use, as specified in the current version of the LLRO (i.e. LLRO version L dated 1 July 2015, as published on Eircom's wholesale website) as may be amended from time to time, and, in addition, in accordance with Eircom's obligations under this Decision Instrument.
- 7.4 Without prejudice to the general obligations set out in Sections 7.1 to 7.3, of this Decision Instrument, Eircom shall:
 - (i) pursuant to Regulation 12(2)(b) of the Access Regulations, negotiate in good faith with Undertakings requesting Access;
 - (ii) pursuant to Regulation 12(2)(c) of the Access Regulations, not withdraw Access to facilities already granted without the prior approval of ComReg and in accordance with terms and conditions as may be determined by ComReg;
 - (iii) pursuant to Regulation 12(2)(e) of the Access Regulations, grant open access to technical interfaces, protocols or other key technologies that are indispensable for the interoperability of products, services or facilities;
 - (iv) pursuant to Regulation 12(2)(h) of the Access Regulations, provide Access to OSS or similar software systems necessary to ensure fair competition in the provision of services (including those products, services and facilities described in this Section 7).

8 CONDITIONS ATTACHED TO THE ACCESS OBLIGATION

- 8.1 Pursuant to Regulation 12(3) of the Access Regulations, Eircom shall, in relation to the obligations set out in Section 7 above, grant Undertakings Access in a fair, reasonable and timely manner.
- 8.2 Without prejudice to the generality of Section 8.1 above, pursuant to Regulation 12(3) of the Access Regulations, Eircom shall:
 - (i) conclude, maintain and update, as appropriate, legally binding SLAs with Undertakings, which shall include provisions for Performance Metrics;
 - (ii) negotiate in good faith with Undertakings in relation to the conclusion of legally binding and fit-for-purpose SLAs (either in the case of a new SLA or an amendment to an existing SLA) ;

- (iii) ensure that SLAs include provision for service credits to be provided by Eircom to Access Seekers in the event that committed service levels are not met;
 - (iv) ensure that SLAs detail the methodology for the calculation of Service Credits and shall include the provision of an example calculation;
 - (v) ensure that the application of Service Credits, where they occur, shall be applied automatically and in a timely and efficient manner;
 - (vi) ensure that the level of the Service Credits are fair and reasonable; and
 - (vii) ensure that the SLAs include Performance Metrics, the latter being the measure of performance levels to be achieved by Eircom within a specified period, as calculated in accordance with the methodology and service parameter definitions as set out in the relevant SLA.
- 8.3 The access obligations set out in this Section 8 shall apply irrespective of the electronic communications service that the requested access product, service or facility shall be used to provide. For the avoidance of doubt, the purpose for which the access request is made is not limited to the provision of services to End Users.

9 OBLIGATION OF NON-DISCRIMINATION

- 9.1 Pursuant to Regulation 10 of the Access Regulations, Eircom shall have an obligation of non-discrimination in respect of the provision of Access, including Access as regards those services, products and facilities described in Sections 7 and 8 of this Decision Instrument. Without prejudice to the generality of the foregoing, Eircom shall:
- (i) apply equivalent conditions in equivalent circumstances to other Undertakings requesting, or being provided with Access (including Access to those products, services and facilities described in Sections 7 and 8 of this Decision Instrument) or requesting or being provided with information in relation to such Access; and
 - (ii) provide Access (including Access to those products, services and facilities described in Sections 7 and 8 of this Decision Instrument) and information in relation to such Access to all other Undertakings under the same conditions and of the same quality as Eircom provides to itself or to its subsidiaries, affiliates or partners.
- 9.2 Without prejudice to the generality of Section 9.1 above, Eircom shall (unless otherwise specified in this Decision Instrument) provide Access, including Associated Facilities, to those products, services and facilities required in accordance with Sections 7 and 8 of this Decision Instrument on, at least, an Equivalence of Outputs basis.

9.3 Without prejudice to the generality of Section 9.1, the obligations contained therein shall apply irrespective of whether or not a specific request for services or information has been made to Eircom by an undertaking.

10 OBLIGATION OF TRANSPARENCY

10.1 Pursuant to Regulation 9 of the Access Regulations, Eircom shall be subject to an obligation of transparency in relation to Access (including Access to those products, services and facilities described in Sections 7 and 8 of this Decision Instrument).

10.2 Without prejudice to the generality of Section 10.1 of this Decision Instrument, pursuant to Regulation 9(2) of the Access Regulations, Eircom shall make publicly available and keep updated on its website, a LLRO and an associated Price List.

10.3 The LLRO shall be sufficiently unbundled so as to ensure that Undertakings availing of Access (including Access to those products, services and facilities described in Sections 7 and 8 of this Decision Instrument) are not required to pay for products, services or facilities which are not necessary for the Access requested.

10.4 Without prejudice to the generality of Section 10.3 of this Decision Instrument, and in accordance with the obligations specified elsewhere in this Decision Instrument, Eircom shall ensure that its LLRO includes at least the following:

- (i) a description of the offer of contract for Access (including Access to those products, services and facilities described in Section 7 and Section 8 of this Decision Instrument) broken down into components according to market needs;
- (ii) a description of any associated contractual or other terms and conditions for supply of Access (including Access to those products, services and facilities described in Sections 7 and Section 8 of this Decision Instrument) and use, including prices;
- (iii) a description of the technical specifications and network characteristics of the Access (including Access to those products, services and facilities described in Section 7 and Section 8 of this Decision Instrument) being offered; and
- (iv) the terms, conditions, Service Level Agreements, guarantees and other product related assurances associated with Low Bandwidth TI WHQA products, services and facilities.

- 10.5 In the event of any conflict between the LLRO and associated documentation such as the LLRO Price List (including where represented as updated for the purposes of this Decision Instrument), and Eircom's obligations as set out under this Decision Instrument, it is the latter which shall prevail.
- 10.6 Without prejudice to the generality of Sections 10.1 and 10.2 above and pursuant to Regulation 9 of the Access Regulations Eircom shall:
- (i) continue to publish and keep updated on its publicly available website, its LLRO in the same form and format as version L, dated 1 July 2015, as may be amended from time to time, insofar as those products, services or facilities contained therein relate to the obligations set out in this Decision Instrument;
 - (ii) publish and keep updated on its publicly available website both clean (or unmarked) and tracked changed (or marked) versions of its LLRO (insofar as it relates to the products, services and facilities to be provided in accordance with the requirements of this Decision Instrument). The tracked change version of the LLRO shall be sufficiently clear to allow Undertakings to clearly identify all actual and proposed amendments from the preceding version of its LLRO;
 - (iii) publish and keep updated on its publicly available website an accompanying LLRO Change Matrix which lists all of the amendments incorporated or to be incorporated in any amended LLRO;
 - (iv) publish and keep updated on its publicly available website both clean (unmarked) and tracked changed (marked) versions of the LLRO Price List(s) (insofar as it relates to the products, services and facilities to be provided in accordance with the requirements of this Decision Instrument). The tracked change version of the LLRO Price List shall be sufficiently clear to allow Undertakings to clearly identify all actual and proposed amendments from the preceding version of its LLRO Price List;
 - (v) publish and keep updated on its publicly available website a LLRO Price List Change Matrix; and
 - (vi) maintain and make publicly available on its wholesale website a copy of historic versions of its LLRO, LLRO Price List, LLRO Change Matrix and LLRO Price List Change Matrix.
- 10.7 Eircom shall ensure that its wholesale invoices are sufficiently disaggregated, detailed and clearly presented such that an Undertaking can reconcile invoices to Eircom's LLRO and LLRO Price Lists.
- 10.8 Eircom shall ensure that its LLRO provides that it shall invoice Access Seekers on a monthly basis, one month in advance of the provision of the relevant service, with credit terms set at 30 days.

- 10.9 In respect of both pricing and non-pricing amendments or changes to the LLRO resulting from either the offer of a new product, service or facility which falls within the scope of the Relevant Low Bandwidth TI WHQA Market or a change to an existing product, service or facility which falls within the scope of the Relevant Low Bandwidth TI WHQA Market, the following obligations will apply:
- (i) Eircom shall, unless otherwise agreed by ComReg, make publicly available and publish on Eircom's publicly available wholesale website at least three (3) months in advance of their coming into effect, any proposed amendments or changes to the LLRO (and any associated documents) or the LLRO Price List(s).
 - (ii) Eircom shall notify ComReg in writing with the information to be published at least five (5) days in advance of any such publication taking place, that is, three (3) months and five (5) days prior to any amendments or changes coming into effect. The periods referred to in this Section may be varied with the agreement of ComReg or at ComReg's discretion.
- 10.10 Eircom shall, as specified by ComReg in writing from time to time, make publicly available on its wholesale website, information such as accounting information, technical specifications, network characteristics, terms and conditions for supply and use, and prices, in respect of the products, services and facilities referred to in Sections 7 and 8 above.
- 10.11 Pursuant to Regulation 9(3) of the Access Regulations, ComReg may issue directions requiring Eircom to make changes or amendments to its SLAs, the LLRO (and its associated documents), LLRO Price List, LLRO Change Matrix or LLRO Price List Change Matrix to give effect to obligations imposed by this Decision Instrument and to publish such documents with such changes. In accordance with Regulation 18 of the Access Regulations, ComReg may issue directions to Eircom from time to time requiring it to publish information, such as accounting information, technical specifications, network characteristics, terms and conditions for supply and use and prices.
- 10.12 Eircom shall publish Key Performance Indicators (KPIs) on its publicly available wholesale website. The specification of the content of the KPIs shall be in accordance with the obligations set out in ComReg Decision D05/11 (as may be amended from time to time). Pursuant to Regulations 8, 9 and 18 of the Access Regulations, the sections of Annex 4 of the Decision Instrument contained in ComReg Decision D05/11 titled "Metrics associated with Supply of Services", "Metrics associated with Designation of Service Orders" and "Metrics associated with Repair of Services" are withdrawn and replaced with the following:

“Metrics associated with leased line Services in the Low Bandwidth TI markets

All figures shall be calculated by Eircom for each Data Collection Period. The figures for each Data Collection Period shall be calculated as described below. They will apply as relevant to each individual metric as laid out in the associated tabature form.

Metric Reference	Title	Definition
5.1.1 to 5.1.3	Percentages of fault on PPC EULs of bandwidths up to 2Mb/s, repaired within 8, 24 and after 24 hours (excludes non-faults and co-op faults)	Percentage of faults (excludes non-faults and co-op faults) reported on PPC EUL's ≤2Mb/s repaired within 8, 24 and after 24 hours, of all faults reported, measured on a quarterly basis
5.1.4 to 5.1.6	Percentages of fault on retail digital TDM leased lines of bandwidths up to 2Mb/s, repaired within 8, 24 and after 24 hours (excludes non-faults and co-op faults)	Percentage of faults (excludes non-faults and co-op faults) reported on retail digital TDM leased lines ≤2Mb/s reported, repaired within 8, 24 and after 24 hours, of all faults reported, measured on a quarterly basis

10.13 Pursuant to Regulations 8, 9 and 18 of the Access Regulations, Tables 5, 6, 7, 8 and 9 of Appendix 2 of the Decision Instrument contained in ComReg Decision D05/11 are withdrawn and replaced with the following:

Metrics associated with Fault Repair	Retail			Wholesale		
	<8 WHs	<24 WHs	>24WHs	<8 WHs	<24 WHs	>24WHs
Low Bandwidth (≤ 2Mb/s) TDM Leased Lines	%	%	%	%	%	%

Table 5: Repair of Low Bandwidth TDM Lines

- 10.14 Eircom shall make publicly available on its wholesale website all SLAs (and any updates thereto) relating to the provision of the products, services and facilities that are to be provided in accordance with Sections 7 and 8 of this Decision Instrument.
- 10.15 Where Eircom considers certain aspects of information to be provided under the obligations set out in this Section 10 to be of a confidential and/or commercially sensitive nature, Eircom shall, without delay, provide ComReg with complete details of such information along with objective reasons justifying why it considers that information is confidential and/or commercially sensitive. If ComReg considers that the information is not confidential and/or commercially sensitive, it shall be published by Eircom in accordance with its obligations under this Section.
- 10.16 If ComReg concludes that the information is confidential and/or commercially sensitive, Eircom shall publish general details as to the nature of such information and shall make it available to an OAO that has signed a Non-Disclosure Agreement ('**NDA**'), the terms and conditions of which shall be fair, reasonable and non-discriminatory. The NDA shall also be published on Eircom's publicly available website. Any confidential and/or commercially sensitive information referred to in Section 10.15 above shall not be made available by Eircom to its downstream operations until such time as it is made available to an OAO, or as otherwise agreed with ComReg.
- 10.17 If and when the commercially sensitive and/or confidential information referred to in Section 10.15 above ceases to be commercially sensitive and/or confidential, it shall be made available by Eircom on its publicly available wholesale website without undue delay and without the need for an NDA to be signed.
- 10.18 For the avoidance of doubt, the obligations set out in this Section 10 apply irrespective of whether or not a specific request for products, services, facilities or information has been made by an Undertaking to Eircom.

11 OBLIGATION OF ACCOUNTING SEPARATION

- 11.1 Pursuant to Regulation 11 of the Access Regulations, Eircom shall have an obligation to maintain separated accounts in respect of the products, services and facilities falling within the scope of this Decision Instrument and the Low Bandwidth TI WHQA Market. All of the obligations in relation to accounting separation, set out at Annexes 1 and 2 of ComReg Decision D08/10, applying to Eircom and in force immediately prior to the Effective Date of this Decision Instrument, and relating to products, services and facilities falling within the scope of this Decision Instrument and the Low Bandwidth TI WHQA Market shall be maintained in their entirety.

12 OBLIGATIONS RELATING TO PRICE CONTROL AND COST ACCOUNTING

- 12.1 Pursuant to Regulation 13(1) of the Access Regulations, Eircom shall maintain appropriate cost accounting systems in respect of products, services and facilities described in Sections 7 and 8 of this Decision Instrument.
- 12.2 Pursuant to Regulation 13(1) of the Access Regulations, the prices offered or charged by Eircom to any Undertaking for Access to, or use of, the products, services or facilities described in Sections 7 and 8 of this Decision Instrument shall be cost orientated.
- 12.3 Pursuant to and in accordance with Regulation 13 of the Access Regulations, the prices offered or charged by Eircom to any Undertaking for any product, service or facilities described in Sections 7 and 8 of this Decision Instrument shall be calculated using a BU-LRAIC+ cost model.
- 12.4 Without prejudice to the generality of Section 12.3, pursuant to Regulation 13 of the Access Regulations, Eircom shall ensure that it recovers no more than its actual incurred costs adjusted for efficiencies (plus a reasonable rate of return) in respect of connection fees for any product, service and/or facility described in Sections 7 and 8 of this Decision Instrument.

PART V – MAINTENANCE OF OBLIGATIONS, WITHDRAWAL OF OBLIGATIONS, OPERATION AND EFFECTIVE DATE (SECTIONS 13 TO 17 OF THE DECISION INSTRUMENT)

13 STATUTORY POWERS NOT AFFECTED

- 13.1 Nothing in this Decision Instrument shall operate to limit ComReg in the exercise and performance of its statutory powers or duties conferred on it under any primary or secondary legislation (in force prior to or after the Effective Date of this Decision Instrument).

14 “SUNSET” PROVISION IN RESPECT OF THE HIGH BANDWIDTH TI WHQA MARKET AND THE MI WHQA MARKET

- 14.1 The obligations imposed by the first sentence of Section 6.2(iii) and by Section 11.2 of the Decision Instrument contained in Appendix A to ComReg Decision D06/08 (as amended) shall continue in force for [six (6) to nine (9)] months from the Effective Date with respect to any products, services or facilities in the High Bandwidth TI WHQA Market or in the MI WHQA Market to which access was previously granted pursuant to or consistent with an obligation imposed by ComReg Decision D06/08 (as amended), or in respect of which access has been sought prior to the effective date of this Decision.

- 14.2 Pursuant to Regulations 8 and 12 of the Access Regulations and Section 6.2(iii) of the Decision Instrument contained in Appendix A to ComReg Decision D06/08 (as amended), Eircom shall not withdraw access to any products, services or facilities in the High Bandwidth TI WHQA Market or in the MI WHQA Market to which access was previously granted pursuant to or consistent with an obligation imposed by ComReg Decision D06/08 (as amended), or in respect of which access has been sought prior to the effective date of this Decision. This obligation to be withdrawn with effect from [six (6) to nine (9)] months from the Effective Date.
- 14.3 Pursuant to Regulations 8 and 13 of the Access Regulations and Section 11.2 of the Decision Instrument contained in Appendix A to ComReg Decision D06/08 (as amended), the prices charged by Eircom for any products, services or facilities in the High Bandwidth TI WHQA Market or in the MI WHQA Market, the prices of which were, immediately prior to the Effective Date, subject to a cost orientation obligation imposed by ComReg Decision D06/08 (as amended), shall be cost oriented. This obligation to be withdrawn with effect from [six (6) to nine (9)] months from the Effective Date.

15 MAINTENANCE OF OBLIGATIONS

- 15.1 Unless expressly stated otherwise in this Decision Instrument, all obligations and requirements contained in Decision Notices and Directions made by ComReg, applying to Eircom, and in force immediately prior to the Effective Date of this Decision Instrument, continue in force and Eircom shall comply with the same.
- 15.2 For the avoidance of doubt, ComReg Decision D03/09 shall remain in full force and effect until further notice by ComReg.
- 15.3 For the avoidance of doubt, to the extent that there is any conflict between a Decision Instrument dated prior to the Effective Date and Eircom's obligations set out herein, it is the latter which shall prevail.
- 15.4 If any Section(s), clause(s), or provision(s), or portion(s) thereof, contained in this Decision Instrument is(are) found to be invalid or prohibited by the Constitution, by any other law or judged by a court to be unlawful, void or unenforceable, that(those) Section(s), clause(s), or provision(s), or portion(s) thereof shall, to the extent required, be severed from this Decision Instrument and rendered ineffective as far as possible without modifying the remaining Section(s), clause(s), or provision(s), or portion(s) thereof, of this Decision Instrument, and shall not in any way affect the validity or enforcement of this Decision Instrument or other Decision Instruments.

16 WITHDRAWAL OF SMP OBLIGATIONS

- 16.1 Pursuant to Regulations 8, 9, 10, 11, 12 and 13 of the Access Regulations, the following Decision Instruments, and/or ComReg Documents and/or Decisions are hereby withdrawn at the Effective Date:
- (i) The Decision Instrument contained in Appendix A of ComReg Document No. 08/103, ComReg Decision D06/08, save as provided for in Section 14 of this Decision Instrument;
 - (ii) The Decision Instrument contained in Appendix A of ComReg Document No. 10/12, ComReg Decision D02/10;
 - (iii) The Decision Instrument contained in Chapter 5 of ComReg Document No. 11/22, ComReg Decision D02/11;
 - (iv) The Decision Instrument contained in Chapter 8 of ComReg Document No. 12/03, ComReg Decision D02/12 save as provided for in Section 14 of this Decision Instrument; and
 - (v) The Decision Instrument contained in Chapter 4 of ComReg Document No. 13/75, ComReg Decision D12/13.

17 EFFECTIVE DATE

- 17.1 The Effective Date of this Decision Instrument shall be the date of its notification to Eircom and it shall remain in force until further notice by ComReg.

JEREMY GODFREY
CHAIRPERSON
THE COMMISSION FOR COMMUNICATIONS REGULATION
THE [] DAY OF [] 2017

Question 7: Do you agree with ComReg's draft Decision Instrument set out in Appendix: 8, in particular, that its wording accurately captures the intentions expressed in this Section 8? Do respondents agree with ComReg's Definitions and Interpretations as set out in Part I of the Draft Decision Instrument? Please explain the reasons for your answer, clearly indicating the relevant paragraph numbers in the Draft Decision Instrument to which your comments refer.⁶¹⁰

⁶¹⁰ Note, this is a repeat of Question 8 set out at page 277 above.

Appendix: 9 Consultation Questions

A 9.1 Below is a list of Consultation questions set out throughout this Consultation.

Question 1:	Do you agree that the main developments identified above in the provision of retail LLs are those which are most relevant in informing the assessment of the wholesale LL markets? Please explain the reasons for your answer, clearly indicating the relevant paragraph numbers to which your comments refer, along with all relevant factual/empirical evidence supporting your views.
Question 2:	Do you agree with ComReg's assessment of the retail LL markets? Please explain the reasons for your answer, clearly indicating the relevant paragraph numbers to which your comments refer, along with all relevant factual/empirical evidence supporting your views.
Question 3:	Do you agree with ComReg's preliminary conclusions on the product and geographic assessment for the Relevant WHQA Markets? Please explain the reasons for your answer, clearly indicating the relevant paragraph numbers to which your comments refer, along with all relevant factual evidence supporting your views.
Question 4:	Do you agree with ComReg's competition and SMP assessments in the Relevant WHQA Markets? Please explain the reasons for your answer, clearly indicating the relevant paragraph numbers to which your comments refer, along with all relevant factual evidence supporting your views.
Question 5:	Do you agree that the competition problems and the associated impacts on competition consumers identified are those which could potentially arise in the LB TI WHQA Market? Please explain the reasons for your answer, clearly indicating the relevant paragraph numbers to which your comments refer, along with all relevant factual evidence supporting your views.
Question 6:	Do you agree with ComReg's approach to imposing access, non-discrimination, transparency, price control and cost accounting and accounting separation remedies? Are there other approaches that would address the identified competition problems? Please explain the reasons for your answer, clearly indicating the relevant paragraph numbers to which your comments refer, along with all relevant factual evidence supporting your views.

Question 7: Do you agree with ComReg's draft Decision Instrument set out in Appendix: 8, in particular, that its wording accurately captures the intentions expressed in this Section 8? Do respondents agree with ComReg's Definitions and Interpretations as set out in Part I of the Draft Decision Instrument? Please explain the reasons for your answer, clearly indicating the relevant paragraph numbers in the Draft Decision Instrument to which your comments refer.

Question 8: Do you agree with ComReg's preliminary conclusions on the Regulatory Impact Assessment? Please explain the reasons for your answer, clearly indicating the relevant paragraph numbers to which your comments refer, along with all relevant factual evidence supporting your position.

Appendix: 10 Glossary of Frequently Used Terms

Figure A10.1: Glossary of frequently used terms throughout this Consultation is set out below.

Acronym	Full Title
3CT	Three Criteria Test
AAC	Average Avoidable Cost
AS	Access Seeker
ATC	Average Total Cost
ATM	Asynchronous Transfer Mode
AVC	Average Variable Cost
BEREC	Body of European Regulators for Electronic Communications
BU	Bottom Up
CATI	Computer Aided Telephone Interview
CBP	Countervailing Buying Power
CCPC	Competition and Consumer Protection Commission
CCTV	Closed Circuit Television
CGA	Current Generation Access
CoS	Class of Service
CPE	Customer Premises Equipment
CSH	Customer sited Handover
DI	Decision Instrument
DSL	Digital Subscriber Line
EC	European Commission
EFM	Ethernet Final Mile
EOI	Equivalence of Inputs
EOO	Equivalence of Outputs
ERG	European Regulators Group (replaced by BEREC)
EU	European Union
EUL	End User Link
FR	Frame Relay
FTTC	Fibre to the Cabinet
FTTH/B	Fibre to the Home/Building
FTTx	Fibre to the x
FWA	Fixed Wireless Access
FWALA	Fixed Wireless Access Local Area
GN	Government Network
HB	high Bandwidth

HDSL	High Speed Digital Subscriber Line
HFC	Hybrid Fibre Cable
HM	Hypothetical Monopolist
HMT	Hypothetical Monopolist Test
HQA	High Quality Access
HQA Provider	Operators offering HQA services
IA	Internet Access
ICT	Information and Technology
IP	Internet Protocol
ISDN	Integrated Services Digital Network
ISH	In-Span Handover
KPI	key Performance Indicator
LB	Low Bandwidth
LL	Leased Line
LLU	Local Loop Unbundling
LRAIC	Long Run Average Incremental Cost
LRAIC plus	Long Run Average Incremental Cost plus
MAN	Metropolitan Area Network
MEA	Modern Equivalent Asset
MGF	Modified Greenfield
MI	Modern Interface
MLA	Main Link Access
MLD	Main Link Distance
MMDS	Multichannel Multiservice Distribution System
MNO	Mobile Network Operator
MPLS	Multiprotocol Label Switching
MSE	Management Services Entity
MST	Margin Squeeze Test
NG	Next Generation
NGA	Next Generation Access
NGN	Next Generation Network
NRA	National Regulatory Authority
NTU	Network Termination Unit
OAO	Other Authorised Operator
OSS	Operational Support Systems
P2P	Point to Point
PABX	Private Automated Branch Exchange
PDH	Pleiochronous Digital Hierarchy
PoA	Price on Application
PoH	Point of Handover
PoP	Point of Presence
PPC	Private Partial Circuit
PSTN	Public Switched Telephone Network

QKDR	ComReg Quarterly Key Data Report
RCBS	Retail Business Connectivity Services
SaaS	Software as a Service
SDH	Synchronous Digital Hierarchy
SEO	Similarly Efficient Operator
SIP	Session Internet Protocol
SIR	Statutory Information Request
SLA	Service Level Agreement
SME	Small to Medium Enterprise
SMP	Significant Market Power
SP	Service Provider
SSNIP	Small but Significant Non-transitory Increase in Price
TDM	Time Domain Multiplex
TDM	Top Down
TI	Traditional Interface
TL	Transport Link
VDSL	Very High Speed Digital Subscriber Line
VoIP	Voice over Internet Protocol
VPN	Virtual Private Network
WAN	Wide Area Network
WEIL	Wholesale Ethernet Interconnection Link
Wholesale LL	Wholesale Leased Line (generic term for wholesale service)
WHQA	Wholesale High Quality Access
WLL	Wholesale Leased Line (refers to Eircom wholesale product)
WLL	Wholesale Leased Line
WSEA	Wholesale Symmetrical Ethernet Access
xDSL	x Digital Subscriber Line (any DSL technology)
xWDM	Wavelength Division Multiplexed (coarse or dense)

Appendix: 11 Maps used in WHQA Market Analysis ✂[REDACTED]

A 11.1 These maps have been redacted due to confidentiality reasons. The maps include the following:

- (i). Alternate Fixed Networks, National;
- (ii). Example of Wireless Reach;
- (iii). Virgin Media Dublin area P2P Radio Links; and
- (iv). Alternate networks and Business Locations.

Appendix: 12 Broadband Offerings and Chain of Substitution Analysis

Introduction

A 12.1 In this Appendix, ComReg sets out the retail business broadband packages (fixed and mobile) available on each platform.

A 12.2 ComReg obtained information on business broadband tariffs, speeds and prices offered by the main operators (Digiweb, Eircom, Imagine, Magnet, Virgin Media, Three and Vodafone) during June 2016. Information was collected on tariffs aimed at non-residential broadband users.

Fixed Business Broadband Packages Offered by Main Operators

Digiweb

A 12.3 Digiweb's business offerings include broadband and phone services. Digiweb currently has seven offerings, two based on DSL and one FTTC product, as well as four satellite based plans.

Table A12. 1 Digiweb Business Packages – DSL and Fibre⁶¹¹

	Business 24	Business Pro	Business Fibre Plan
Contract Length	12 months	12 months	12 months
Introductory Price (Months)	-	-	-
Price (incl. VAT) per month	€35.67	€47.97	€67.65
Download Speed Mb/s	Up to 24	Up to 24	Up to 100
Upload Speed Mb/s	1	1	20
Download Allowance GB	40	350	350
Line Rental	Included	Included	Included
Once-off Charges	€49 activation fee	€49 activation fee	€49 activation fee
Other Services included	Equipment, installation, free calls to local, national and mobile numbers, free internet security for 6 months.	Equipment, installation, free calls to local, national and mobile numbers, free internet security for 6 months.	Equipment, installation, free calls to local, national and mobile numbers, free internet security for 6 months.

⁶¹¹ <http://business.digiweb.ie/compare-plans/>

Table A12. 2 Digiweb Business Packages - Satellite

	Tooway Business 25 ⁶¹²	Tooway Business 40 ⁶¹³	Tooway Business 100 ⁶¹⁴	Tooway Business 200 ⁶¹⁵
Contract Length				
Introductory Price (Months)				
Price (incl. VAT) per month	€88.50	€122.94	€307.44	€487.02
Download Speed Mb/s	Up to 22	Up to 22	Up to 22	Up to 22
Upload Speed Mb/s	Up to 6	Up to 6	Up to 6	Up to 6
Download Allowance GB	25 (optional night time unlimited traffic between 12am and 6am)	40 (optional night time unlimited traffic between 12am and 6am)	100 (optional night time unlimited traffic between 12am and 6am)	200 (optional night time unlimited traffic between 12am and 6am)
Line Rental	-	-	-	-
Once-off Charges	€270.53 activation fee	€270.53 activation fee	€270.53 activation fee	€270.53 activation fee
Other Services included	Free internet security for 6 months.	Free internet security for 6 months.	Free internet security for 6 months.	Free internet security for 6 months.

Eircom

A 12.4 Eircom offer packages for small and medium sized businesses, large corporations and packages for the public sector.⁶¹⁶ The table below gives a brief overview of the packages offered to small and medium businesses.

⁶¹² <http://business.digiweb.ie/product/tooway-business-25-satellite-plan/>.

⁶¹³ <http://business.digiweb.ie/product/tooway-business-40-satellite-plan/>.

⁶¹⁴ <http://business.digiweb.ie/product/tooway-business-100-satellite-plan/>.

⁶¹⁵ <http://business.digiweb.ie/product/tooway-business-200-satellite-plan/>.

⁶¹⁶ <https://business.eir.ie/>.

Table A12. 3 Eircom bundles for Small and Medium Businesses⁶¹⁷

	Unlimited Broadband⁶¹⁸	Broadband and Landline 1⁶¹⁹	Broadband and Landline 2	Broadband and Landline 3
Introductory Price (Months)	12 months	12 months	12 months	12 months
Price (incl. VAT) per month	€49	€49	€55	€68
Download Speed Mb/s	100	Max. speed line permits	Max. speed line permits	Max. speed line permits
Download Allowance GB	Unlimited	40	40	40
Other Services included	Pay for landline calls as made	200 minutes to landlines, 30 minutes to any mobile network, unlimited calls to Eircom mobiles.	Unlimited calls to landlines, 60 minutes to any mobile network, unlimited calls to Eircom mobiles.	Unlimited landline and mobile calls, and unlimited calls to Eircom mobiles.

Table A12. 4 Eircom bundles for Small and Medium Businesses (continued)⁶²⁰

	Broadband and Landline 4	Broadband and Landline 5	Broadband and Landline 6	Advantage Wi-Fi⁶²¹
Introductory Price (Months)	12 months	12 months	€40 (6 months)	
Price (incl. VAT) per month	€55	€62	€74	€49
Download Speed Mb/s	Max. speed line permits	Max. speed line permits	Max. speed line permits	100
Download Allowance	Unlimited	Unlimited	Unlimited	Unlimited
Other Services included	200 minutes to landlines, 30 minutes to any mobile network, unlimited calls to Eircom mobiles.	Unlimited calls to landlines, 60 minutes to any mobile network, unlimited calls to Eircom mobiles.	Unlimited landline and mobile calls, and unlimited calls to Eircom mobiles.	Free installation with 24/7 online and phone support.

⁶¹⁷ <https://business.eir.ie/broadband/advantage-bundles/>

⁶¹⁸ <https://business.eir.ie/broadband/advantage-bundles/#tab-broadband-mobile-bundle>

⁶¹⁹ <https://business.eir.ie/broadband/advantage-bundles/#tab-broadband-landline-bundle>

⁶²⁰ <https://business.eir.ie/broadband/advantage-bundles/>

⁶²¹ <https://business.eir.ie/advantage-wifi>

Table A12. 5 Eircom standalone broadband packages for businesses⁶²²

	Business Broadband 40GB (standalone)	Business Broadband Unlimited (standalone)	Business Advantage Boost - 1GB (standalone)	Business Advantage Boost 300MB (standalone)	Business Advantage Boost 150MB (standalone)
Contract Length	12 months	12 months	12 months	12 months	12 months
Introductory Price (Months)	-	-	-	-	-
Price (incl. VAT) per month	€43	€49	€110	€92	€67
Download Speed Mb/s	100	100	1000	300	150
Upload Speed Mb/s	20	20	100	70	30
Download Allowance GB	40	Unlimited	Unlimited	Unlimited	Unlimited
Line Rental	-	-	-	-	-
Once-off Charges	€131	€131	€131	€131	€131
Other Services included	-	-	-	-	-

Imagine

A 12.5 For business customers, Imagine offer broadband over a contention wireless service, FWA broadband, and DSL broadband. The contention wireless broadband packages are outlined in the table below.

⁶²² <https://www.eir.ie/opencms/export/sites/default/.content/pdf/pricing/Part3.1.pdf>

Table A12. 6 Imagine Contended Wireless Broadband Packages (Business)⁶²³

	4 Mb	6 Mb	6Mb Plus	6 Mb Pro
Contract Length	12 months	12 months	12 months	12 months
Introductory Price (Months)	-	-	-	-
Price (incl. VAT) per month	€52.99	€86.11	€165.62	€231.87
Download Speed Mb/s	4	6	6	6
Upload Speed Mb/s	4	6	6	6
Download Allowance GB	Unlimited	Unlimited	Unlimited	Unlimited
Line Rental	-	-	-	-
Once-off Charges	€120 connection fee + €40.65 set up charge	€120 connection fee + €40.65 set up charge	€120 connection fee + €40.65 set up charge	€120 connection fee + €40.65 set up charge
Other Services included	-	-	-	-
Contention	24:01:00	24:01:00	12:01	04:01

A 12.6 Imagine's FWA broadband offering for businesses is outlined in the table below.

Table A12. 7 Imagine FWA Broadband Package (Businesses)⁶²⁴

	Imagine Fibre 70 (Business)
Contract Length	12 months
Introductory Price (Months)	-
Price (incl. VAT) per month	€41.73
Download Speed Mb/s	70
Upload Speed Mb/s	20
Download Allowance GB	Unlimited
Line Rental	-
Once-off Charges	€40.65
Other Services included	Free modem

A 12.7 Finally, Imagine's DSL based broadband packages for businesses are presented in the table below.

⁶²³ <http://www.imaginebusiness.ie/wireless-business-broadband/#toggle-id-1>

⁶²⁴ <http://www.imaginebusiness.ie/fibre-business-broadband/>

Table A12. 8 Imagine DSL Broadband Packages for Businesses⁶²⁵

	DSL (1)	DSL (2)	DSL (3)	DSL (4)	DSL (5)
Contract Length	12 months	12 months	12 months	12 months	12 months
Introductory Price (Months)	-	-	-	-	-
Price (incl. VAT) per month	€21.89	€32.84	€43.79	€87.59	€164.24
Download Speed Mb/s	3	7.8	12	24	18
Upload Speed	384 Kb/s	672 Kb/s	1 Mb/s	1Mb/s	2 Mb/s
Download Allowance MB	Unlimited	Unlimited	Unlimited	Unlimited	Unlimited
Line Rental	€20.96	€20.96	€20.96	€20.96	€20.96
Once-off Charges	€49.59, or rent wireless router for €4.13 per month.	€49.59, or rent wireless router for €4.13 per month.	€49.59, or rent wireless router for €4.13 per month.	€49.59, or rent wireless router for €4.13 per month.	€49.59, or rent wireless router for €4.13 per month.
Other Services included	-	-	-	-	-
Contention	48:01:00	12:01	12:01	12:01	12:01

Magnet

A 12.8 For business consumers, Magnet offer packages tailored toward small, medium and large businesses, with packages for large businesses being custom designed based on specified requirements.

⁶²⁵ <http://www.imaginebusiness.ie/dsl-business-broadband/>.

Table A12. 9 Magnet Broadband Packages for Small Businesses⁶²⁶

	Small Office Fibre 100⁶²⁷	Office in a Box (Voice, BB, Domain)⁶²⁸	Business Fibre 100⁶²⁹	Bespoke Fibre Broadband⁶³⁰
Contract Length	-	-	-	-
Introductory Price (Months)	€44.27 (6 months)	-	-	€53
Price (incl. VAT) per month	€86.09	€204.17	€52.89	
Download Speed Mb/s	100	100	100	100
Upload Speed Mb/s	20	-	20	20
Download Allowance GB	Unlimited	-	-	Unlimited
Line Rental	Yes	-	-	-
Once-off Charges	-	-	-	-
Other Services included	Unlimited calls to Irish, UK, USA landlines and mobiles, and 18 other top countries.	Unlimited calls to Irish, UK, USA landlines and mobiles, and 18 other top countries.	-	-

Virgin Media

A 12.9 Virgin Media provide broadband packages to business customers, including standalone broadband services and office packages that also include phone services.⁶³¹

⁶²⁶ <http://www.magnet.ie/business/business-type/small-business/>.

⁶²⁷ <https://www.magnet.ie/business/products/small-office-fibre-100/>.

⁶²⁸ <https://www.magnet.ie/business/products/office-box/>.

⁶²⁹ <https://www.magnet.ie/business/products/business-fibre-100/>.

⁶³⁰ <https://www.magnet.ie/business/products/medium-large-business-broadband/>.

⁶³¹ <https://www.virginmedia.ie/business/>.

Table A12. 10 Virgin Media Broadband for Businesses

	Business 100 ⁶³²	Business 200 ⁶³³	Business 300 ⁶³⁴	Business 400 ⁶³⁵
Contract Length	12 months	12 months	12 months	12 months
Introductory Price (Months)	-	-	-	-
Price (incl. VAT) per month	€55	€68	€80	€92
Download Speed Mb/s	100	200	300	400
Upload Speed Mb/s	10	20	30	40
Download Allowance GB	Unlimited	Unlimited	Unlimited	Unlimited
Line Rental	-	-	-	-
Once-off Charges	€80 installation fee	€80 installation fee	€80 installation fee	€80 installation fee
Other Services included	Phone lines included, unlimited minutes for local, national and UK fixed lines plus 200 mobile minutes.	Phone lines included, unlimited minutes for local, national and UK fixed lines plus 200 mobile minutes.	Phone lines included, unlimited minutes for local, national and UK fixed lines plus 200 mobile minutes.	Phone lines included, unlimited minutes for local, national and UK fixed lines plus 200 mobile minutes.

Vodafone

A 12.10 Vodafone cater for small, medium and large businesses, public sector organisations.⁶³⁶

A 12.11 The table below details Vodafone's business broadband packages, including a standalone broadband package for businesses.

⁶³² <https://www.virginmedia.ie/business/products-solutions/business-broadband-phone/business-100/>.

⁶³³ <https://www.virginmedia.ie/business/products-solutions/business-broadband-phone/business-200/>.

⁶³⁴ <https://www.virginmedia.ie/business/products-solutions/business-broadband-phone/business-300/>.

⁶³⁵ <https://www.virginmedia.ie/business/products-solutions/business-broadband-phone/business-400/>.

⁶³⁶ <https://www.vodafone.ie/index.jsp?site=business>.

Table A12. 11 Vodafone Business Broadband Packages⁶³⁷

	Simply broadband business for	Office Essentials	Office Professional	Office Unlimited
Contract Length	18 months	18 month	18 month	18 month
Introductory Price (Months)	-	-	-	-
Price (incl. VAT) per month	€43	€49	€55	€68
Download Speed Mb/s	Max. that line permits (1000,100, 24)	Max. that line permits (1000,100, 24)	Max. that line permits (1000,100, 24)	Max. that line permits (1000,100, 24)
Upload Speed Mb/s	20	20	20	20
Download Allowance GB	Unlimited	Unlimited	40	Unlimited
Line Rental	-	Included in price	Included in price	Included in price
Once-off Charges	€41	€41	€41	€41
Other Services included	1 TB cloud storage with OneDrive for Business	Unlimited calls to Irish landlines, 200 minutes to Vodafone mobiles.	Unlimited calls to Irish landlines and mobiles	Unlimited calls to Irish and UK landlines and mobiles, 1 TB of Cloud storage

Table A12. 12 Vodafone Business Broadband – Phone and Broadband Packages (Multiline) – Broadband component only⁶³⁸

	Standard	Unlimited
Contract Length	18 months	18 months
Introductory Price (Months)	-	-
Price (incl. VAT) per month	€31	€37
Download Speed Mb/s	24/100	24/100
Upload Speed Mb/s	20	20
Download Allowance GB	40	Unlimited
Line Rental	-	-
Once-off Charges	€29.99	-
Other Services included	-	-

⁶³⁷ <http://www.vodafone.ie/small-business/fixed/single-line/>.

⁶³⁸ <http://www.vodafone.ie/small-business/fixed/multi-line/>.

Mobile Broadband Packages Offered by Main Operators

A 12.12 This section gives a brief outline of the business mobile broadband packages on offer to retail consumers. Business mobile broadband packages are offered by Three, Vodafone and Eircom.

Three

A 12.13 Three offers mobile broadband packages for businesses, as outlined in Table A12.15 below.

Table A12. 13 Three Business Mobile Broadband Packages⁶³⁹

	4G Three Broadband 3GB	4G Three Broadband 20GB	4G Three Broadband 60GB	4G Three Broadband 100GB	4G Three Broadband 250GB
Contract Length	-	-	-	-	-
Introductory Price (Months)	-	-	-	-	-
Price (incl. VAT) per month	€13.5177	€27.0477	€40.5777	€54.1077	€67.6377
Download Speed Mb/s	42	42	42	42	42
Upload Speed Mb/s	-	-	-	-	-
Download Allowance GB	3	20	60	100	250
3G/4G	4	4	4	4	4
Prepay/Billpay	Bill pay	Bill pay	Bill pay	Bill pay	Bill pay
Once-off Charges	-	-	-	-	-
Other Services included	-	-	-	-	-
Device	-	-	-	-	-

Eircom Mobile

A 12.14 Eircom Mobile offer 4 mobile broadband packages to retail consumers, which are outlined in Table A12.16 below. These packages are geared towards business consumers as they are advertised only on the Eircom business website.

A 12.15 This table outlines the billpay mobile broadband packages.

⁶³⁹ <http://www.three.ie/business/solutions/mobile-plans/#mobile-broadband>.

Table A12. 14 Eircom Billpay and Billpay SIM only Mobile Broadband Packages⁶⁴⁰

	Broadband 2GB	Broadband 10GB	Broadband 2GB SIM-Only	Broadband 10GB
Contract Length	-	-	-	-
Introductory Price (Months)	-	-	-	-
Price (incl. VAT) per month	€9.225	€20.3196	€9.225	€29.52
Download Speed Mb/s	42	42	42	42
Upload Speed Mb/s	-	-	-	-
Download Allowance GB	2	10	2	10
3G/4G	4G	4G	4G	4G
Prepay/Billpay	Bill pay	Bill pay	Bill pay	Bill pay
Once-off Charges	€25	-	-	€99
Other Services included	Device included	Device included	-	Device included
Device	Huawei E3272	Huawei E3272	-	Sony Xperia Z2

Vodafone

A 12.16 Vodafone's business mobile broadband packages are outlined in Table A12.17.

⁶⁴⁰ <https://business.eir.ie/mobile-broadband>.

Table A12. 15 Vodafone Billpay Mobile Broadband Packages⁶⁴¹

	Red MBB Plus	Red MBB Super	Red MBB Ultra
Contract Length			
Introductory Price (Months)	-	-	-
Price (incl. VAT) per month	€21.99	€29.99	€49.99
Download Speed Mb/s	65	65	150
Upload Speed Mb/s	-	-	-
Download Allowance GB	15	30	50
3G/4G	4G	4G	4G
Prepay/Billpay	Bill pay	Bill pay	Bill pay
Once-off Charges			
Other Services included	Device included	Device included	Device included
Device	Vodafone Mobile WiFi R216	Vodafone Mobile WiFi R216	Vodafone Mobile WiFi R216

Methodology applied in calculating the monthly cost of business broadband

A 12.17 The methodology applied in calculating the monthly cost of broadband (both residential and non-residential tariffs) is outlined below:

- **Tariff Duration:** Use a tariff duration specified by operators - typically 12 or 18 months.
- **Relevant Bundle:** Determine what the relevant bundle or product is. This could be broadband, broadband plus line rental etc. Isolate the broadband only component, or use a set fixed price to account for other items in a bundle (e.g. line rental, basic calls).
- **Installation/Connection Fees:** Only include standard installation/connection fees.
- **Promotions/Introductory Offers:** Only include discounted tariff costs and exclude other promo offers.
- **Excess charges:** Assume the majority of broadband users will not exceed data allowances.

⁶⁴¹ <http://shop.vodafone.ie/shop/mobile-broadband/standard-mobile-broadband-sim>.

- A 12.18 Operators typically offer broadband services with 12 or 18 month contracts. To allow tariffs to be compared accurately, ComReg computed the average broadband cost on the basis of an 18 month contract length. Over the 18 months, a broadband consumer would typically incur installation/connection fees (if applicable), receive any promotional price for a set period (if offered), pay for line rental (if charged) and pay the standard tariff price for the remainder of the contract length.
- A 12.19 As broadband services are typically packaged with a phone service or line rental charge, we account for this in the pricing analysis. Where packages include other services such as TV or mobile telephony services, ComReg seeks to use the most basic bundle. As such, the cost of other services in the bundle are excluded to isolate the cost of the broadband service.
- A 12.20 For installation and connection fees, we assume that the majority of customers will incur standard charges. Many operators do not charge for standard installation or connection. We therefore exclude any non-standard charges involving installing new cabling or where an engineer is required. Furthermore, we assume the majority of consumers will use the standard equipment offered by the operator, such as a wireless router.
- A 12.21 To encourage customer switching, many operators offer discounts and promotions to new customers. Typically these promotions are a discounted price for a number of months and/or a reduction in installation/connection fees. These promotional prices are accounted for in the assessment below. Other promotions or offers that do not relate to the headline broadband price are not accounted for. Examples of such promotions include access to over-the-top services or cashback offers.
- A 12.22 ComReg notes that many broadband services are offered with unlimited download allowances or a fair-usage data allowance. However operators typically have charges for excess usage. ComReg assumes that the majority of customers do not exceed their download allowance and so excess charges are not considered within the methodology below.

Calculation of Monthly Cost

- A 12.23 ComReg computes the cost of broadband by adding the following:
- The recurring tariff cost for the first 18 months, accounting for:
 - Any promotional or introductory price offered; and
 - The recurring monthly cost after any promotional or introductory period;
 - The recurring cost of Line rental (if applicable) for the first 18 months; and
 - Any one-off or non-recurring charges relating to standard installation or connection.
- A 12.24 The above figure is then divided by 18 to give an average cost of the broadband service.

A 12.25 Consider the following example: Operator X sells a broadband service at €30 a month, with a minimum contract of 12 months. Operator X has a promotional offer whereby the first 3 months of service are offered for €10 a month. Operator X charges €20 a month for its standard line rental and has an installation fee of €79. The total cost of the broadband service over 18 months is as follows:

- Recurring Tariff Cost = $(3 \times €10) + (15 \times 30) = €480$
- Line Rental Charges = $(18 \times €20) = €360$
- Installation Charges = €79

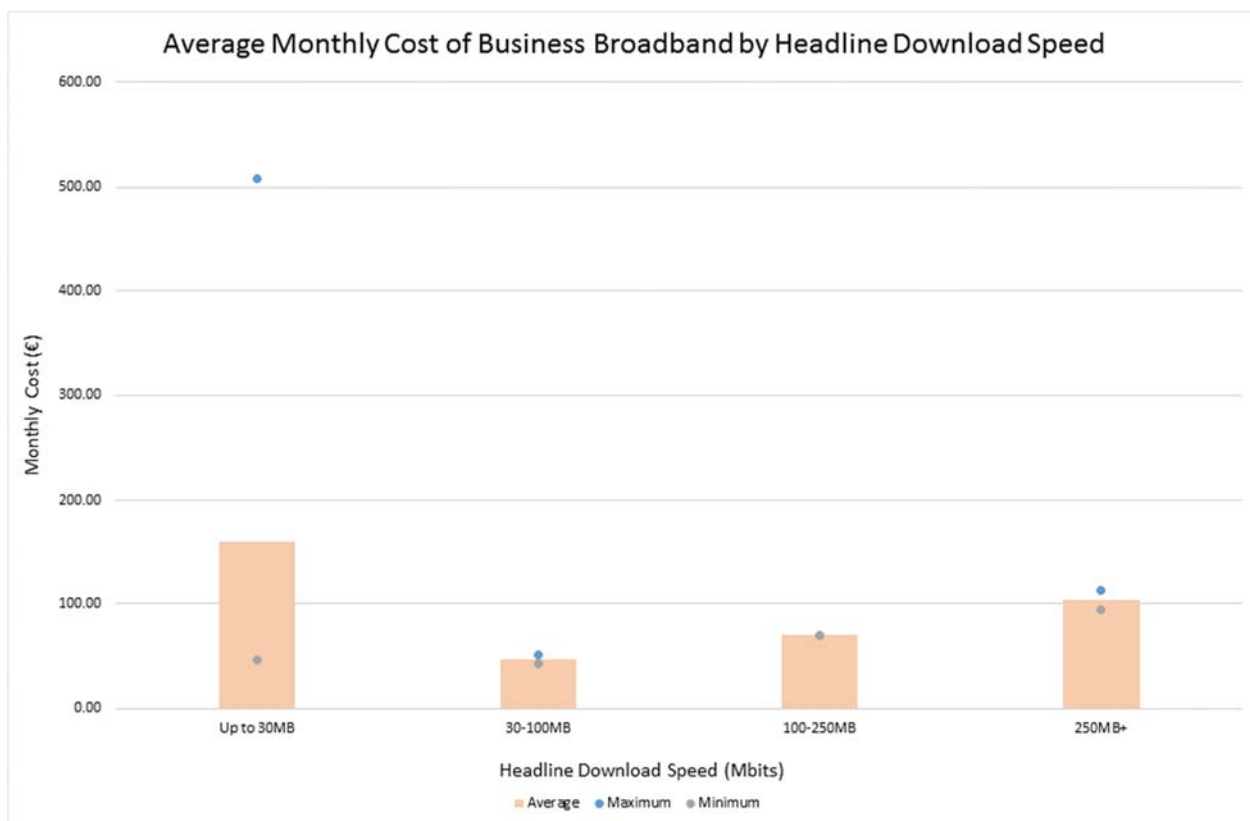
A 12.26 The total cost of the broadband service for 18 months is €919, or an average cost of €51 per month.

Business broadband pricing

A 12.27 ComReg analysed the broadband tariffs offered by five operators and identified 40 tariffs or bundles that included a broadband service aimed at business broadband users. The 28 tariffs examined offered speeds ranging from 3 Mb/s to 1 Gb/s, with most offering an unlimited download allowance.

A 12.28 Figure A12.1 below shows the average monthly cost of broadband for these 28 tariffs, by 'headline' download speed, using the methodology outlined above. Figure A12.1 also shows the range of the monthly costs for business broadband tariffs, for each headline speed.

Figure A12. 1 Average Monthly Cost of Business Broadband by Headline Download Speed



Source: ComReg calculations based on tariff data from operators' websites. Accessed June 2016

A 12.29 Figure A12.1 shows that for each broadband speed, there is an overlap with the range of costs associated with other similar headline speeds. For example the monthly cost of broadband offered at speed 'up to 24Mb/s' falls within the range of the average cost of broadband offered at speeds 24-100 Mb/s and 100-250 Mb/s.